TOWN OF WELLINGTON
PLANNING COMMISSION
June 5, 2023
6:30 PM

Leeper Center, 3800 Wilson Avenue, Wellington CO

REGULAR MEETING

Individuals wishing to make public comments must attend the meeting in person or may submit comments by sending an email to birdca@wellingtoncolorado.gov. The email must be received by 3:00 p.m. Friday, June 2, 2023. After 3:00 p.m. on June 2, written public comments can not be accepted. The comments will be provided to the Commissioners at the meeting. Emailed comments will not be read during the meeting.

The Zoom information below is for online viewing and listening only.

Please click the link below to join the webinar:
https://us06web.zoom.us/j/86154011660?pwd=VnZxZlRtUHRmNCtVSVpOcDIvYjZlQT09
Passcode: 446308
Webinar ID: 861 5401 1660
Or One tap mobile:
US: +17207072699,,87576162114# or +12532158782,,87576162114# Or Telephone:
US: +1 720 707 2699 or +1 253 215 8782 or +1 346 248 7799

---

1. CALL TO ORDER
2. ROLL CALL
3. ADDITIONS TO OR DELETIONS FROM THE AGENDA
4. PUBLIC FORUM
5. CONSIDERATION OF MINUTES
   A. Meeting Minutes of May 1, 2023
6. OLD BUSINESS
   A. Connell Resources Site Plan Review (Continued from May 1, 2023)
7. ANNOUNCEMENTS
8. ADJOURNMENT

The Town of Wellington will make reasonable accommodations for access to Town services, programs, and activities and special communication arrangements Individuals needing special accommodation may request assistance by contacting at Town Hall or at 970-568-3381 at least 24 hours in advance.

Planning Commission Meeting

Date: June 5, 2023
Submitted By: Patty Lundy, Planning Analyst
Subject: Meeting Minutes of May 1, 2023

EXECUTIVE SUMMARY

BACKGROUND / DISCUSSION

STAFF RECOMMENDATION

Approve the regular meeting minutes of May 1, 2023 as presented.

ATTACHMENTS

1. Minutes of May 1, 2023

TOWN OF WELLINGTON
PLANNING COMMISSION
May 1, 2023

MINUTES
REGULAR MEETING – 6:30 PM

1. CALL REGULAR MEETING TO ORDER – 6:30 p.m.

   The Planning Commission for the Town of Wellington, Colorado, met on May 1, 2023, at the Wilson Leeper Center, 3800 Wilson Avenue, Wellington, Colorado at 6:30 p.m.

2. ROLL CALL

Commissioners Present:	Eric Sartor, Chairperson Lisa Chollet Tim Whitehouse Bert McCaffrey Stephen Carman
Absent:	Lowrey Moyer Linda Knaack
Town Staff Present:	Cody Bird, Planning Director Paul Whalen, Planner III Patty Lundy, Planning Analyst

3. ADDITIONS TO OR DELECTIONS FROM THE AGENDA

   None

4. PUBLIC FORUM

   Ben Leistikow stated he thought the online form for public comments on the Connell site plan application might not be working. He did not see his comments in the packet for the meeting.

5. CONSIDERATION OF MINUTES

   A. Meeting Minutes of April 3, 2023

   Commissioner McCaffrey moved to approve the meeting minutes of April 3, 2023. Commissioner Chollet seconded.

   Yeas – Chollet, Whitehouse, McCaffrey, Carman, Sartor
   Nays – None
   Motion carried

6. NEW BUSINESS

A. **Site Plan Review - Connell Resources Asphalt Plant - Continued from March 6, 2023**

Cody Bird, Planning Director said that this was a continuation from the March 6th meeting. From that meeting there were questions asked and additional information requested. The Town received a letter from the applicant requesting a continuance until June 5, 2023 to allow additional time for the applicant's consultants to prepare the requested information, including an air dispersion model.

Commissioner Chollet mentioned that there were two Commissioners absent and felt they should be available for the vote on this topic.

Commissioner Carman wanted to know if the thirty (30) days would be enough. Bird replied that the applicant expected the studies and information to be available in the next two weeks and felt that it should be enough time.

Chairman Sartor thanked everyone for coming to the meeting and for sharing comments. He also thanked those who could not be at the meeting but took the time to write in their comments. He explained that usually there would be a staff presentation, applicant presentation as well as the Commissioner's having a discussion before opening a public hearing. Since the applicant has requested a continuance to allow time for the studies, the presentation materials were not available tonight. He stated the Commission would prefer to hear public comments at the next meeting when the information was presented, but also wanted to allow those present to make comments if they felt the need.

Commissioner Whitehouse pointed out there were about 180 pages of written public comments and other documents submitted for this meeting and about 91 pages from the last meeting. The Commissioners do read the comments submitted.

Patti Garcia, Town Administrator reported that there did appear to be some comments submitted online that did not get included in the packet. She will look into what happened and make sure the comments were included for the next meeting.

Matt Goepel asked what the Commission's mission statement is. He mentions that Commissioner Knaack had read it at the earlier meeting and thought it should be restated.

Nancy McKay did not believe that there were consultants or that they need more time to get the results. She also did not think that the setbacks should be changed for this company.

Ben Trabing wanted to know what experts the Town has to be able to understand the air dispersion models.

Dianne McQuaid would like to see the study report posted before the next meeting.

Josh Kerson does not believe that the high stacks should be allowed in our community due to the chemicals it lets off.

Erin Ramler said that since Mr. Warren already admitted there are chemicals, that the 2,640-foot minimum setback applies. He already has to get four permits for this so the decision should already be made to not allow it. Why do you need the other information to give you the details on the toxic chemicals? It should not be allowed because there are toxic chemicals.

Sara Mickshl and her sons Tyler and Cooper want the Commission to follow the Land Use Code and says the Commissioners job is to protect the community. It will also make all of the homes drop in price.

Fred Condos read a letter that the Commissioners already had for the audience. It was about Connell being out of compliance for over four months and not paying their fee for a year.

Dan Matlock said he had a friend that sat behind a wheel of one of the trucks for 20 years. He told him about the noise, chemicals and the changes that will happened to the community for the worse.

Chairman Sartor thanked everyone for their comments and stated that the Commissioners are listening. There have not been any decisions made on this application yet.

Commissioner Chollet wanted to clarify that the Planning Commission does not hear variances to change the setbacks. That was the role of the Board of Adjustments. Now it has come to the Planning Commission with the setback requirements, and they are to look at the site plan. The Land Use Code guides them to what the Commission considers for site plans. They are reading and listening to all the information and following all the steps. We all live here, and we are volunteers that do care. The Planning Commission does not get paid, and none are receiving any financial gain.

Chairman Sartor asked one more time if anyone else would like to share comments.

Ben Leistikow asked if the Town reached out to Larimer County and to the State about the toxic chemicals. Does the Town need help from others in the community that does know a lot about these topics.

Jason Janssen asked what the fire department is going to do and if they can handle anything that happens out there. He asked the Town to think about what this will do to the town. He asked why not let Carr (Carr, Colorado) have this plant? Let them have it.

Chairman Sartor asked for a motion to table the site plan.

Commissioner Chollet moved to table the site plan review for Connell Resources to the regular meeting of the Planning Commission to be held June 5, 2023 at 6:30pm at the Wilson Leeper Center.

Motion seconded by Commissioner McCaffrey.

Yeas – Chollet, Whitehouse, McCaffrey, Carman, Sartor
Nays – None
Motion carried

7. COMMUNICATIONS

Bird said that there are 3 other applicants for the June 5th meeting. He wanted to know if the Commissioners would be available for a special meeting for the other applicants since old business is first which would be the continuance from this meeting.

The Commissioners discussed this and said they could meet the following Monday which will be June 12th, 2023. Bird will reach out and ask the applicants if they could meet on June 12th, 2023.

Commissioner Whitehouse asked if there was a letter received from a State Representative on the Connell Resources Site Plan. Commissioner Chollet said that Senator Janice Marchman reached out to her by letter and phone call – She did not take the call. Bird stated staff received the letter and it will be included in the packet at the June 5th meeting.

8. ADJOURNMENT

Chairman Sartor adjourned the regular meeting at 7:06 PM.

Approved this_____day of _____, 2023

_____

Recording Secretary

Planning Commission Meeting

Date: June 5, 2023
Submitted By: Cody Bird, Planning Director
Subject: Connell Resources Site Plan Review (Continued from May 1, 2023)

EXECUTIVE SUMMARY

See attached staff report and supporting documentation.

BACKGROUND / DISCUSSION

STAFF RECOMMENDATION

Staff recommends the proposed site plan, subject to staff report comments and recommended conditions of approval (paragraph 15 above), satisfies the Findings for Approval for a site plan in accordance with the Land Use Code.

Below are motion options for the Planning Commission to consider. Town staff will also be available to assist the Planning Commission in modifying a motion option if desired to achieve the Planning Commission's intent.

1. Move to approve the site plans for Connell Resources subject to conditions identified in the staff report (paragraph 15).
2. Move to approve the site plans for Connell Resources subject to conditions identified in the staff report and also including condition(s) _____, _____, [...], and _____.
3. Move to deny the site plan for Connell Resources.

ATTACHMENTS

1. Staff Report
2. Site Plan Procedures
3. Location Map
4. Site Separation Exhibit
5. Town Presentation Slides
6. Applicant Narrative
7. Site Development Plans
8. Applicant Response and Exhibits
9. Refined Modeling Report - May 18, 2023
10. Refined Modeling Report - Appendix A
11. Refined Modeling Report - Appendix B
12. Addendum to Refined Modeling Report - May 26, 2023
13. Revised Traffic Impact Study
14. Larimer County Health Dept. Presentation Slides
15. Public Comments - Addendum to May 1, 2023 Packet
16. Public Comments - May 30, 2023

Planning Commission Meeting

Meeting Date: June 5, 2023 (Continued from May 1, 2023)

Submitted By: Cody Bird, Planning Director

Subject:

- Connell Resources Asphalt Plant Site Plan Review – A parcel of land situated in the NE ¼ Section 28, Township 9 North, Range 68 West of the 6th, P.M. Town of Wellington, County of Larimer, State of Colorado.

General Location:

South of E Larimer County Road 66 and west of the BNSF railroad crossing.

Applicant/Agent:

Applicant: John Warren, Connell Resources

Reason for request:

- Request review for a proposed site plan for a new Connell Resources Asphalt Plant facility.

Background Information:

- **Prior Meeting Information:** The site plan review application submitted by Connell Resources, Inc. was originally submitted for and heard at the March 6, 2023 Planning Commission meeting. Subsequently, the request was tabled to allow time to perform studies and address questions raised. A brief background is provided below:
- **March 6, 2023:** The request for site plan review was heard by the Planning Commission at the March 6th, 2023, regular meeting. The agenda item was continued to the May 1, 2023 Planning Commission meeting to allow more time to consider the volume of public comments and testimony presented. The Planning Commission also requested additional information and data prior to making a decision. The March 6, 2023 Planning Commission agenda packet, including written public comments received, is available on the Town's website at: https://www.wellingtoncolorado.gov/Archive.aspx?AMID=56.
- **May 1, 2023:** At the May 1st, 2023 regular meeting, the applicant requested a continuance to the June 5, 2023 regular meeting. The continuance was requested because the studies and reports the applicant contracted were not yet complete and time was needed to finish the reports and provide for review. The continuance was granted, and the agenda item was tabled to June 5, 2023. The May 1, 2023 Planning Commission agenda packet, including written public comments received, is available on the Town's website at: https://www.wellingtoncolorado.gov/Archive.aspx?AMID=56.
    - Additional public comments were submitted in writing and did not get included in the original May 1, 2023 agenda packet. The written public comments received were published in an amended packet also available on the Town's website at: https://www.wellingtoncolorado.gov/Archive.aspx?AMID=56.

- The following list identifies additional information requested by the Planning Commission and are addressed in this report and included attachments:
    - Air Dispersion Model and Air Emission Characterization
    - Emission Standards and Regulatory Agencies
    - Consideration of Adequate Separation and Setbacks
    - Traffic Impact Study
    - Noise Level Data and Information
    - Health and Environment Impacts
    - Consideration of Groundwater Impacts and Monitoring
    - Architectural Character and Building Elevations

- **Site Plan Review Process and Findings for Approval:**
    - A site plan review is submitted to Town staff for review in accordance with Section 2.12 of the Land Use Code (attached). Town staff reviews the site plan and may refer the application to other affected review agencies (example: Larimer County, utilities companies, school districts, other regulatory agencies, or others).
    - Town staff reviews site plans and presents the site plans and review findings to the Planning Commission. The Planning Commission is the final review and decision-making authority for a site plan application.
    - In reviewing a site plan application, the Planning Commission considers the Findings for Approval, Subsection 2.12.3, below:
        A. The site plan is consistent with the Comprehensive Plan and the intent stated in this Land Use Code.
        B. The lot size and lot dimensions are consistent with what is shown on the approved final plat.
        C. No buildings or structures infringe on any easements.
        D. The proposed site grading is consistent with the requirements of any applicable adopted storm drainage criteria or master drainage plans.
        E. The density and dimensions shown conform with Article 4 of this Code (Town Land Use Code) or the approved PUD requirements.
        F. The applicable Development Standards have been adequately addressed and the proposed improvements conform with Article 5 of this Code (Town Land Use Code).
    - In consideration of a site plan application, the Planning Commission may take one of the following actions:
        - Approve the site plan;
        - Approve the site plan with conditions of approval;
        - Deny the site plan application.

Staff Comments:

- The application for this site plan review request was submitted for the March 6, 2023 Planning Commission meeting and was subsequently tabled. As part of the review process, the site plan was referred to other reviewing agencies and review comments were received. The applicant submitted a second round of site plan drawings to address the initial review comments. Site plan drawings were updated to address review comments, and the applicant has also submitted a revised traffic impact study based on Town comments and Larimer County recommendations. The revised site plans and revised traffic impact study have been reviewed by Town staff and referral agencies.

- The applicant has also performed the necessary studies and models in response to the Planning Commission's request for additional information. The applicant has prepared a response letter and included applicable studies and reports attached as exhibits with their response letter. The applicant's letter is attached with this report.
- Below are topics the Planning Commission requested additional information and the analysis or reports that have been prepared in response to the questions.
- Air Dispersion Model and Air Emission Characterization
    - The site plans for this application were referred to Larimer County Department of Public Health and Environment (LCDPHE). LCDPHE recommended and the Planning Commission requested the applicant perform testing and studies for Air Dispersion and Air Emissions Characterization.
    - The applicant has contracted with Antea Group, a professional firm specializing in environment, health, safety and sustainability. Antea Group prepared modeling using AERMOD, the air quality dispersion modeling recommended and preferred by the U.S. EPA (Environmental Protection Agency).
        - EPA defines a preliminary risk-based screening approach for air toxics monitoring data sets. According to the EPA, the basic concept behind the risk-based initial screening level methodology is to evaluate air monitoring data sets using a framework that is, by design, relatively simple to perform yet conservative (i.e., health protective) in nature. This initial screening methodology is designed, through the use of conservative decisions, to identify pollutants for which risks are unlikely to be of concern. Accordingly, if all of the monitoring data "pass the screen" using this approach, the analyst may be able to conclude that the monitoring results are indicative of acceptably low risk and that a more robust analysis (were one to be done) would come to the same conclusion.
    - Antea Group prepared the modeling and submitted the results in a report dated May 18, 2023. The report was presented to LCDPHE for review (May 18, 2023 report attached).
        - The report details modeling for criteria pollutants as well as Hazardous Air Pollutants (HAPS).
        - The modeling is based upon the actual equipment the applicant proposes to locate on the site, actual and proposed topography, and meteorological data for the site.
        - The modeling is also based upon the maximum volume permitted for the proposed asphalt batch plant (a "worst-case scenario" approach).
        - The modeling evaluates receptor locations at the nearest residence (Waldo residence), Wellington Community Park, and Eyestone Elementary School.
    - Upon initial review, LCDPHE identified additional questions and requested updates to the modeling. Antea Group prepared an addendum to address LCDPHE comments (May 26, 2023 report attached).
    - LCDPHE determined that the air dispersion modeling for criteria pollutants and hazardous air pollutants were determined to be below both chronic and acute levels known to cause harmful health impacts under Federal and State screening values and health guideline values.
- Emission Standards and Regulatory Agencies
    - The U.S. EPA sets national standards for air pollutants. The Colorado Air Pollution Control Division is Colorado's regulatory agency that oversees compliance with national standards. Larimer County provides investigations and inspections for the State Air Pollution Control Division for operations located in Larimer County. Additional information for regulation and enforcement is included in LCDPHE's presentation and the applicant's responses.

- The LCDPHE presentation slides are included in this packet and includes tables of the screening limits for acute and chronic values for criteria pollutants and hazardous air pollutants.

- Consideration of Adequate Separation and Setbacks
  - The Board of Adjustment considered and approved a variance from the setback requirement defined in Subsection 4.03.21.A. of the Land Use Code for setbacks between an Industrial and Manufacturing, Heavy use and a residential district (1,000 ft. required). The Board of Adjustment granted a variance on October 27, 2022 reducing the setback distance for the proposed site to 800 ft., including conditions of approval.
  - At prior Planning Commission meetings and in public comments received, Subsection 4.03.21.B. has been brought up as possibly needing additional consideration.
    - 4.03.21.B. states: Any Industrial and Manufacturing, Heavy use producing and curating toxic chemicals or conducting animal slaughtering shall be located at least:
      1. Two thousand six hundred forty (2,640) feet from any residential district, religious land use, medical care facility, or school.
      2. One thousand three hundred twenty (1,320) feet from any commercial use.
      3. Six hundred sixty (660) feet from any Industrial and Manufacturing, Light use.
    - A hot mix asphalt plant is a permitted Industrial and Manufacturing, Heavy use.
    - "Producing and curating toxic chemicals" is not defined within the Land Use Code.
    - A hot mix asphalt plant utilizes aggregate materials (sand, gravel and recycled asphalt millings) that are heated and combined with bitumen (an oil by-product) to create hot asphalt. The raw materials involved are not generally considered to be hazardous and do not carry the "hazardous" placard label for transporting on State and County roadways.
    - Finished asphalt products are common in the built environment and are applied on State, County and local roadways, commercial parking lots, and driveways. The finished product is generally not considered to be a hazardous product. The temperature at which asphalt is mixed and applied may be considered dangerous due to the heat (approximately 250 degrees).
    - By-products of the hot mix asphalt process generate air emissions from the burning of natural gas and heating of the aggregate materials. Air emissions are regulated by Federal, State and County departments. Hot mix asphalt plants are permitted and regulated in accordance with applicable Federal, State and County air emission standards. There are no local standards that are more stringent than the State and EPA standards enforced through the State permitting process.
    - When the setback variance request was submitted to the Board of Adjustment, staff recommended that conditions of approval be considered to require obtaining and maintaining all applicable permits, including for air emissions.
    - Fuel storage and dispensing facilities are licensed and monitored by the State of Colorado Division of Oil and Public Safety. Containment and operational best management practices will be required in compliance with all regulatory requirements.
    - Subsection 4.03.21.B. also contemplates animal slaughtering - processes involved in animal slaughter are not a factor for this application.
    - Based upon the above, and the recommended condition to obtain and maintain all applicable permits, the 2,640 setback for "producing and curating toxic chemicals" was not identified as needing a variance.

        - Air dispersion modeling reports and evaluation of the equipment and proposed site development plan have identified and determined that expected air emissions will be below applicable chronic and acute screening values for criteria pollutants and hazardous air pollutants as established by the EPA.
        - Other setbacks contemplated in Subsection 4.03.21.B. from religious land uses, medical care facilities and schools (2,640 feet), commercial uses (1,320 feet), and other Industrial and Manufacturing, Light uses (660 feet) are all satisfied by the proposed site plan.
        - A site separation exhibit is attached with this report and includes radius distances of 800 ft., 1,000 ft. and 2,640 ft. to illustrate the relationships of the proposed site to surrounding development and key sites.
- Traffic Impact Study
    - A revised traffic impact study was prepared in response to Town and referral agency review comments. The revised traffic impact study is attached for reference.
    - The study identifies that the proposed site development will generate 254 daily trips, including passenger vehicles and large trucks (a trip is one vehicle, one way – thus a truck delivery to a site and returns is counted as two trips).
    - The truck routing plan is included in the traffic impact study and is identified as large trucks utilizing County Road 7 north to Owl Canyon Road so that truck traffic (except for local deliveries) will not negatively impact Town roads or intersections.
    - The study identifies that level of service will require improvements to local and regional roadways based upon the trip generation and identified routes. The applicant is required to improve roadways adjacent to the site in accordance with Town standards and improve county roadways impacted to Larimer County standards. This includes paving of County Road 66 from County Road 9 to County Road 7 and the addition of turning lanes at impacted intersections where required.
- Noise Level Data and Modeling
    - The applicant conducted an analysis of their existing site and equipment at their Timnath location to identify the base level of noise generation expected for site operations. The base information from the Timnath site was also modeled at the Wellington proposed location as a "Predictive Sound Analysis" with noise contour mapping to illustrate expected noise volumes generated by site operations. Both the existing conditions analysis of the Timnath site and the predictive analysis for the Wellington site are included in the applicant's response letter.
    - The highest volume expected from the site operations is at the location of the generator on the site (source = 83 decibels). Noise contour mapping illustrates that the decibel level diminishes further away from the source. The contour mapping also illustrates the effect of landscape berms to mitigate the effects of sound travel.
    - On the Wellington sound level predictive analysis, 55 decibels (limit defined by Larimer County) is expected to be exceeded beyond the property line (unmitigated, based on existing site conditions).
    - The recommendation from the predictive sound analysis for the Wellington site recommends constructing earth berms along the perimeter of the site at a height to adequately contain noise sources within the property lines.
        - The Board of Adjustment required earth berms as a condition of approval for the variances granted, including a 15-foot high earth berm along the west side of the site. The earth berms required by the Board of Adjustment are reflected on the site plans.
        - The Planning Commission may also make the earth berms a condition of approval for the site plans.

- Environmental Impacts
    - Questions arose at the March 6, 2023 Planning Commission regarding the need for environmental assessments and remediation plans.
        - Remediation plans are associated with properties that have contamination. There is no known contamination existing on the site. It is possible that the term "remediation" may have been used interchangeably with the term "reclamation." A reclamation plan may be a requirement for sites that extract raw materials and are associated with a mining and extraction permit. There are no extraction operations proposed as part of this site development plan. All aggregate materials will be brought from offsite.
        - The Town does not have any existing requirements for environmental assessments for land development processes. Hot mix asphalt plant permitting also does not require an environmental assessment.
        - The applicant contracted with a local Fort Collins, CO consulting firm specializing in biological, soil and risk assessment services to provide a wildlife mitigation plan.
        - The wildlife assessment identifies that the property proposed for development has limited wildlife habitat due to existing and past agricultural activities on the site and adjacent historic land uses.
        - There were no Threatened and Endangered Species habitat areas identified within or near the property area. Aquatic Native Species Conservation Waters along Boxelder Creek are outside the property development area and Pronghorn Winter Concentration habitat is identified as having limited habitat value due to current land uses.
        - The report does not identify any wildlife mitigation strategies as warranted for the property due to limited wildlife habitat on and near the property.

- Consideration of Groundwater Impacts and Monitoring
    - The applicant has committed to evaluate the existing groundwater quality conditions to establish a baseline of information for the site and identify any potential existing groundwater contamination prior to site development.
    - Two groundwater monitoring wells are also proposed to be installed by the applicant and registered with the State Engineering Office for ongoing monitoring and results available to the State and the Town.

- Architectural Character and Building Elevations
    - Discussion at the March 6, 2023 Planning Commission meeting identified a desire to have additional building architecture and building elevation information provided.
    - The applicant has provided material and color samples that would be utilized on site. Because full architectural plans and renderings have not been procured at this time, the applicant has provided photographs of buildings and structures that are typical of industrial and light industrial developments. All buildings on site are intended to be made of similar and compatible materials (excludes equipment and silos).
    - The site plan proposes and is required to provide earthen berms for screening and landscaping. The berms and landscaping are intended to screen site operations from public view. Only the main office building at the northwest corner of the site is intended to be visible from public view.

Site Plan Review:

The Findings for Approval for a site plan review are listed below along with Staff's recommendation for each finding.

Findings for Approval (Land Use Code Subsection 2.12.3)

A. The site plan is consistent with the Comprehensive Plan and the intent stated in this Land Use Code.

- The site development plan is supported by goals and strategies identified in the Comprehensive Plan in the following ways:
    - TE 2.5 Ensure new industrial developments are consistent with the Town's infrastructure master plans and the Town's water efficiency plan.
    - TE 4.1 Balance residential with commercial land uses to promote local job opportunities and needed services for residents.
    - CP 2.6 Identify partners and resource to build a campaign to promote air quality in and around Wellington to ensure air quality is maintained as Wellington and the North Front Range continues to grow.
    - F&P. 2.3. Require new development to demonstrate how they will connect to and improve the existing networks for active transportation, vehicular traffic, open space and parks, and essential infrastructure for water, wastewater, and stormwater.
- Development of the property for Industrial uses is consistent with the recommendations of the Future Land Use Map included in the Comprehensive Plan. The property is identified as Industrial on the Future Land Use Map and the proposed site development plan proposes a permitted Industrial land use.
- The Master Street Plan Map of the Comprehensive Plan identifies County Road 66 adjacent to the site as an Arterial Roadway. The applicant is preparing road improvement plans adjacent to the site for review by the Town in accordance with the Town's arterial roadway standards (and appropriate transitions back to County rural roadway standards where needed).
- The Town's Land Use Code establishes a variety of zoning district classifications according to the use of land and buildings with varying intensities of uses and standards whose interrelationships of boundary zones form a compatible pattern of land uses and buffer areas which enhance the value of each zone.
    - The Industrial District is intended to provide a location for large-format buildings for manufacturing, warehousing and distributing, indoor and outdoor storage.
        - Proposed development of the site includes large buildings, manufacturing and distribution and includes outdoor material storage.
    - Locations for the Industrial zone require good access to major arterial streets and adequate water, sewer and power.
        - The proposed development site is located adjacent to County Road 66, identified as an arterial roadway. Proposed development of the site includes County Road 66 as the primary access route and utilizes other arterial roadways (County Road 7, Owl Canyon Road and I-25) for large truck routes.
    - The Industrial District requires that dust, fumes, odors, smoke, vapor and noise shall be confined to the site and controlled in accordance with state air pollution laws
        - Recommended conditions of approval include obtaining and maintaining applicable State and County permits.
    - Approved outdoor storage areas, equipment and refuse areas shall be concealed form view from abutting rights-of-way and from adjoining residential districts.
- The Comprehensive Plan encourages economic growth that promotes diversity of employment and service opportunities in the town.

B. The lot size and lot dimensions are consistent with what is shown on the approved final plat.

- The property is not currently platted. The property is approximately 35 acres in size (including proposed road right-of-way that is to be dedicated). The property is proposed to be platted through a separate application process to dedicate the easements and right-of-way in accordance with the design of the site plan. The proposed site plans identify a single lot approximately 30 acres in size and would be sufficient to satisfy the lot size and dimension standards for the Industrial district.

C. No buildings or structures infringe on any easements.

- A plat is proposed to follow site plan review to dedicate required street right-of-way and utility easements. Right-of-way and easements are proposed to be aligned based upon Town needs for roads and utilities configurations. The proposed buildings and structures associated with the site plan will not encroach or infringe upon any platted, existing or proposed easements.

D. The proposed site grading is consistent with the requirements of any applicable adopted storm drainage criteria or master drainage plans.

- Town Public Works and Engineering staff have reviewed the proposed drainage report and site grading design. Town Engineering has commented that the site design is or will be made to comply with the applicable Town stormwater drainage criteria and the Town's adopted Stormwater Master Plan.

E. The density and dimensions shown conform with Article 4 of this Code (Town Land Use Code) or the approved PUD requirements.

- Density and dimension standards of Article 3 of the Land Use Code are followed. The size of the site provides far greater than the minimum required 1:1 floor area ratio. Yard setbacks (25 ft. front yard, 20-ft. side yard and 10-ft. rear yard) are all in compliance. There is no PUD recommended for this proposed site development plan.

F. The applicable Development Standards have been adequately addressed and the proposed improvements conform with Article 5 of this Code (Town Land Use Code).

- The Staff report provided for the March 6, 2023 Planning Commission identified Town Planning Dept. comments and Town Public Works and Engineering comments for site layout and design and technical criteria. The March 6, 2023 staff report comments are still valid for the proposed site development plan and are copied below.

The site is comprised of 35.56 acres. The property is proposed to be platted through a separate application process to memorialize the easements and dedications created and established through the site plan process. If the site plan is approved, the Town will be negotiating an agreement to re-align its existing water distribution line consistent with the establishment of the new easements, new private road and dedication of additional LCR 66 Right-of-Way.

1. Building Setbacks and dimensional standards for the Industrial Zone District: The proposed buildings will not encroach on any required building setbacks (Table 3.02.7 of the Town's Land Use Code: 25ft - Front; 20ft - side and 10ft – rear). The Board of Adjustment granted a variance on October 27, 2022 to increase the height of the silo (only the silo). The variance for structure height allows only the silo structure to exceed the maximum district height of 45 ft. The silo is allowed to be up to a maximum height of 70 ft.
2. Use Specific Standard Setback: Per Section 4.03.21-A, the Use Specific Standard for Heavy Industrial land use requires a 1,000-ft setback from any residential district or use. The Board of Adjustment granted a variance on October 27, 2022, allowing the use setback standard to be reduced to 800-ft from the property line to the heavy industrial operations.
3. Easements: The Town and applicant propose relocating the Town's existing water distribution utilities and adjusting or re-establishing new easements to accommodate the recommenced utility relocations. If the site plan is approved, the applicant will then submit a plat application to memorialize the adjusted LCR 66 right-of-way, and easement dedications. The proposed buildings and structures will not encroach on any platted, existing or proposed easements.

4. Streets and Access: A private roadway (future W. 1st Street) is proposed along the western property line adjacent to the North Poudre Irrigation Ditch/Sundance subdivision, granting two points of access to the Connell site. The public and Town will be granted access and use of the roadway via an easement that will be recorded by separate instrument and memorialized on a future plat application. The re-located Town utilities will be placed within this proposed access and utility easement. In addition, LCR 66 is scheduled for improvements to accommodate the increased heavy truck traffic and may require additional right-of-way dedications. Site access, including office and administration, is restricted to normal business hours of operation.
5. Pedestrian Connection: Sidewalks are proposed adjacent to the improved LCR 66 road along the northern property line in accordance with Town standards. As this is a heavy industrial facility and operates on private internal roads and driveways, the site's internal roadways do not have sidewalks. Due to the truck traffic associated with operations, sidewalks along the east side of the private road are not recommended. The applicant has requested, and staff has agreed, a sidewalk adjacent and west of the future W 1st Street is more practical to provide a connection to Wellington Community Park as a trail connection. Town staff, the Sundance developer and Connell Resources have had discussions about a possible pedestrian sidewalk, and subdivision access along the west side of the proposed private road to benefit Sundance subdivision and pedestrian access.
6. Parking: Parking is provided throughout the site for a variety of uses. Employee and customer parking with standard vehicle spaces 9 X 18 is provided at the main office (36 spaces), with employee-only parking limited to the welding/maintenance service areas (20 spaces) located along the western edge of the site. Restricted additional parking spaces of varying size and length are provided throughout the site for overnight parking and storage of heavy equipment—trucks, semis and earth-moving equipment. Access to the facility, including all parking spaces, is limited to normal business hours when the gates are open. Heavy industrial uses are required to provide a minimum of (1) parking space per each 1,000 sq. ft. of gross floor area. The buildings consist of 21,380 sq. ft. of floor area, requiring 22 parking spaces. Fifty-six parking spaces are proposed for employee and customer parking, exceeding the requirement.
    - SIZE: Parking spaces will comply with the minimum width and depth requirements. The drawing shows parking spaces that comply with these dimensions.
    - BICYCLE RACK INFO: A bicycle rack is proposed and located near the administrative office on the site plan.
    - SCREENING: The proposed parking lots are primarily screened from off-site public views by the perimeter landscape berm required as a condition of approval for a variance request by the Board of Adjustment. The Administration/Office building parking lot will be screened by a 4-5ft berm and landscape materials.
7. Circulation Aisles: Circulation aisles meet the minimum 24-ft. width requirement for two-way traffic circulation, and emergency vehicle access applicant has confirmed all measurements on the drawings.
8. ADA: ADA Standards for Accessible Design require accessible parking spaces based upon the total number of parking spaces provided on site. When (25) parking spaces are provided, a minimum of (1) accessible parking space is required, and (1) must be van accessible. Two accessible parking spaces are provided, meeting the requirement.
    - LOCATION/CLUSTER: The proposed office building is oriented north to south with the primary entrance located at the south-west corner. The ADA spaces are shown in this location. All spaces are van accessible spaces. Two accessible spaces are located near the public entrance on the west side of the building.
    - PATHWAY TO BUILDING OR CURBS: All ADA spaces have a curb cut with sidewalk ramps, and all have an ADA-compliant accessible path into the building.

- The applicant or their designated agent shall ensure that all accessible parking spaces and routes meet the requirements of ADA standards including locations, widths, aisles, slopes, signage, and pavement markings. Sufficient details shall be included and coordinated in the civil engineering and architectural plans, as provided.

9. Signage: Planning staff has requested approximate signage locations be shown on the site plan for relationship coordination purposes only. **Per the Town's Board of Adjustment COA#4, signage may not be located on the silos.** The applicant has been informed signage is permitted through a separate Town application procedure.
    - The current applicant intends to return with wall sign specifications at a later time in a separate application.
    - Staff requests Planning Commission authorization for staff to review all future submitted sign details (wall and monument signs) for this site and administratively approve.
10. Site Lighting: A photometric plan was provided with the site plans and was found to be in compliance with the Town's Exterior Lighting standards. Adequate lighting is essential for safe operation during the late evening hours, silo and tower walkways and passages must be adequately illuminated for employee safety.
    - The Town's maximum illumination level at the property line or 20-FT beyond, is 0.1 foot-candle. The plan complies with the 0.1 maximum illumination.
    - The Town has a minimum illumination level of 1.0 foot-candle for parking areas and pedestrian paths for safety and security. The parking and sidewalk along the west building elevation comply with the minimal 1.0 footcandle illumination criteria, the maintenance service and loading areas also comply with a minimal illumination level of 5.0 footcandles.
    - LIGHTING DETAILS: The applicant provided manufacturer cut-sheets with specific model details about the proposed light fixtures. Specified fixtures are acceptable.
    - CONCERNS OR DISCUSSION FOR APPLICANT: The lighting package has been reviewed and the plan with details and manufacturer cut sheets comply with the intent and spirit of the Town's land use code.
11. Landscape/Screening and Buffering: (Section 5.04.14): The applicant has proposed a landscape plan that satisfies the minimum (15%) required landscape for the project. Primarily focused on perimeter buffering, the required landscape improvements include a minimum of 8-ft width perimeter landscape area that may include a pervious surface such as rock mulch/native soils with (1) tree per 40-ft (25% of required trees are evergreen). In addition to the landscape required by the Town's Land Use Code, the Board of Adjustment also requested a fifteen-foot landscaped earthen berm along the west and northern property lines to screen the site from the adjacent residences. **(Per the Town's Board of Adjustment COA#3 a fifteen-foot earthen berm shall be required along the western property line to screen/buffer the adjacent residences).**
    - Street Trees: The town standard of (1) street tree is required for each 40 linear feet of street frontage for a minimum requirement of (60) trees. Sixty-one deciduous and evergreen trees are shown as accents to the earthen berm along LCR 66 and the proposed west roadway (W 1st Street). These trees are located on the landscape berm to enhance the screening effect.
    - Site Trees: Approximately 15% (or 232,350 SF) of the site is required for landscape with the proposed areas typically located along the site perimeter and on the berms. Approximately 6,000 SF of the required landscape area is proposed at the administration office, and at a ratio of (1) tree per 1,000 sq. ft. (6) site trees are required.
        - The (60) required street trees in the listed species are consistent with the Town's Landscape & Irrigation Design Manual standards and are acceptable.
        - The proposed street and site tree locations and species will define the property perimeter and right-of-way and enhance the screening effectiveness of the earthen berm.

        - The proposed office landscaping with reduced berm height will screen the parking lot and compliment the aesthetic quality of the office building environment.
        - The tree planting rhythm adds character to the LCR 66 ROW.
    - Shrubs/Ground coverage: Shrub and groundcover/native grasses are required in the vicinity of the admin/office. The 6,000 SF of landscape area thus requires (40) shrubs, (71) shrubs (31-grasses) have been provided and thus satisfy Town standards.
        - SHRUB/TREE SUBSTITUTION: Tree substitution is not proposed. The applicant has provided (108) shrubs & grasses and 167,334 SF of native grasses to meet the town code requirement
    - Parking Lot Trees/Shrubs/Screening: (Section 5.04.15) Parking lots with 10 or more spaces are required to provide trees in islands and shrubs, berms, fencing or a combination thereof for screening and buffering. A sufficient number of tree and shrub species and earthen berms are proposed to meet the parking lot island screening requirements to screen/buffer the parking lots from public views.
        - LIGHT/TREE CONFLICT: There are no lighting/tree conflicts at this time.
        - CONCERNS OR ITEMS FOR DISCUSSION: Adequate screening/buffering is provided to screen the parking lots to comply with the intent of the Town code.
    - Other:
        - SIGHT TRIANGLE CONCERNS: Landscaping is not proposed in the sight triangle areas on the private or LCR 66 ingress/egress roads. Visibility onto LCR 66 and the future W 1st Street will not be infringed by plant materials.
        - SEPARATE TAP: The Town requires a separate tap/meter for irrigation and a separate tap/meter for domestic use. However, the BOA recommended the Town provide a separate water tap/source for only the administration/office operations, and non-potable water provided for landscape and daily plant operations. The applicant stated the non-potable water would be delivered to the site via tank trucks. An irrigation plan was provided in the plan set indicating the irrigation water source is limited to non-potable water as recommended by the BOA. Town-supplied potable water should only be used for domestic/office uses. Location and size of water sources/taps/hydrants/POCs shall be indicated on the civil engineering plans.
        - POTABLE WATER/XERIC CONFIRMATION: Per the Board of Adjustments recommendation, the potable water provided by the Town should be limited for office use/human use & consumption only, the landscape and day-to-day plant operations will utilize a non-potable water source trucked into the site via water tanks. The landscape architecture firm has confirmed the plants provided have been specifically chosen as low/xeric water-use efficient plants, shrubs, and trees to ensure long-term health of plants, water conservation and financial savings for owners.
12. Drainage: The applicant has provided plans indicating proposed site grading and drainage patterns with details for staff review. The Public Works engineering team has reviewed the project with review comments provided for the applicant to address. The developed site with 35.56 acres indicates an approximately 18.1% impervious area. The drainage report proposes surface flows across the property to a detention basin located in the southwest corner. The basin location in the lowest area of the property, conflicts with the required earth berm which must be relocated. An on-site drainage network conveys the storm water flow via swales and culverts to the detention pond which then flows into the North Poudre Irrigation Company ditch on the west-side of the future W 1st Street. Any required site modifications shall be addressed in a final drainage plan & report in accordance with Planning and Public Works.

13. Utilities:
    - Town Utilities: Water and sewer services are available in LCR 66 with sufficient capacity to serve the site. These services will be extended along the future W 1st Street south to the office/administration building location. The town-supplied potable water source shall be limited to administrative office operations/domestic uses only. The applicant proposes using a potable Town water tap to serve the occupied structures. Non-potable water for landscape irrigation and daily plant production operations will be brought in from off-site sources via truck delivery. A sanitary sewer line and potable water mainline will extend from the existing service lines located in LCR 66 south to the office location on the future W. 1st Street. The site plan submission did include civil engineering plans and details for connections to the public lines. The site plan approval is conditioned upon final review and approval by the Town Engineer.
    - Other Utilities: The applicant is responsible for coordinating with private companies to ensure that all utilities are installed underground.
    - Fire District Review: A six or eight-inch fire line will be routed around the site to serve fire hydrants as located by the Fire Department and the Town's Public Work Dept. The fire lines/hydrants shall be located within an easement with access granted to the Town for emergency access and fire line maintenance.
14. Architectural Design Standards: The Town's architectural design standards for industrial developments shall be adequately satisfied. The Town's Comprehensive Plan encourages an assortment of building types and sizes to support a diverse business base contributing to the Wellington economy. Predominantly large metal warehouse-type buildings, industrial facilities are encouraged to embrace a variety of architectural characters and themes. The Town's landscape regulations have also been updated to promote perimeter landscaping to screen and buffer the site and land use activity from public view. The fueling facility, maintenance building- a welders' shop, and administrative professional offices total 21,380 sq. ft. of floor area.
    - MASSING/SCALE: The admin/office building is a single-story metal building with a stone wainscot base, an earth-tone color theme, and substantial landscaping. The berm height is reduced to screen the parking lot, but yet maintain a visual connection to the public realm. Public access to the facility is limited to only normal hours of business operation by a fenced gate. The other structures closed to the public still embrace the character and color theme of the administration building to create a harmony and consistency across the site. The other buildings and structures/batch plant operation equipment will be functional utility structures housing welding and mechanical shops for equipment maintenance and repairs, all screened from public views. The architectural materials, style and color themes are matched and consistent and are typical for an industrial operation. Human and garage doors and roll-up docking station doors allow access into the structures. The lean-to structures will be open and screened by berms.
    - DESCRIPTION OF MATERIALS: The building is proposed to be finished primarily with metal panels, stone wainscot walls, tinted glazing, and architectural metal trim and accents as approved by the Town. Roofing materials proposed include raised seam metal roofing panels.
    - SCREENING OF MECHANICAL EQUIPMENT AND ROOFTOP UNITS: All ground-mounted mechanical equipment and rooftop units will be screened from public views via a screen wall and/or landscape elements to comply with Town code.
    - DUMPSTER SCREENING: Trash dumpsters will be located near shops and screened from public views behind the required earth berms. The trash dumpsters will be readily accessible for dumping and not visible from off-site public views.

- SECURITY FENCING: The office-administration building shall be open to the general public during normal office hours with the remainder of the site closed to public access. The site shall be secured with chain link fencing at the two gated points of entry. A standard 3-strand perimeter livestock fence will secure the remainder of the site from public access during non-business hours.

15. Conditions of Approval: Town Staff recommends the below conditions of approval for this site plan:
    - Satisfaction of the Conditions of Approval of the BOA Variance granted October 27, 2022;
    - Addressing all staff report comments;
    - Final engineering plans accepted by the Town Engineer;
    - Obtain and provide evidence of satisfaction of all county, state and federal permits including but not limited to:
        - Air Quality
        - Storm Water Discharge
        - Process Water Discharge
        - Fugitive Dust
        - Operations Plan
        - Noise Ordinance
        - County Odors
        - Fuel Storage
    - Satisfaction of all referral agency comments;
    - Other conditions as directed by the Planning Commission.
16. Corrected Plans: If the Planning Commission approves the site plan, the next step requires the applicant to revise the site plan documents to incorporate all corrections, comments and/or Planning Commission conditions, including Town engineering review of the civil plans, and submit revised copies to the Town.
    - Revisions to the site plan shall be clouded, and a written response listing all changes shall be provided, noting which comment each response is addressing.
    - All drawings and plans must be coordinated so there is no differing information on the civil and architectural plans.
    - Provide 2 full-sized plans, and 2 half-sized plan sets, and an electronic submission must be submitted to the Town's Planning Department prior to receiving a building permit.
    - Building plans will not be reviewed or permits issued until revised plans are accepted by the Town.

Staff Recommendation:

Staff recommends the proposed site plan, subject to staff report comments and recommended conditions of approval (paragraph 15 above), satisfies the Findings for Approval for a site plan in accordance with the Land Use Code.

Below are motion options for the Planning Commission to consider. Town staff will also be available to assist the Planning Commission in modifying a motion option if desired to achieve the Planning Commission's intent.

1. Move to approve the site plans for Connell Resources subject to conditions identified in the staff report (paragraph 15).
2. Move to approve the site plans for Connell Resources subject to conditions identified in the staff report and also including condition(s) _____, _____, [...], and _____.
3. Move to deny the site plan for Connell Resources.

Attachments:

- Staff Report
- Site Plan Procedures
- Location Map
- Site Separation Exhibit
- Town Presentation Slides
- Applicant Narrative
- Site Development Plans
- Applicant Response and Exhibits
- Refined Modeling Report – May 18, 2023
- Refined Modeling Report – Appendix A
- Refined Modeling Report – Appendix B
- Addendum to Refined Modeling Report – May 26, 2023
- Revised Traffic Impact Study
- Larimer County Health Presentation Slides
- Public Comments – Addendum to May 1, 2023 Packet
- Public Comments – May 30, 2023

2.12 Site Plan

2.12.1 Purpose and Applicability. The site plan shall be submitted to apply for a building permit for all permitted principal uses of multi-family, commercial and industrial developments. The site plan shows lot arrangement and site design so the Town can make sure the site plan complies with all Town regulations. A site plan shall also be submitted for any re-development, substantial changes to an existing site, changes that affect site circulation or access, and for any exterior modifications to an existing building within the C-2, Downtown Commercial District to show compliance with the Cleveland Avenue Architectural Standards. When a development requires approval as a conditional use, the site plan approval process shall be processed concurrently with the conditional use application.

2.12.2 Procedure. All site plan applications shall comply with the following specific procedures in addition to the general procedures in Section 2.04.2

A. *Preapplication Conference.* A pre-application conference is required for a site plan application to discuss specific application procedures, criteria, and requirements for a formal application. This requirement may be waived at the discretion of the Planning Director or designee.

B. *Land Use Application Submittal*. In addition to the requirements set forth in Section 2.04.3, a site plan application shall include:

1. Traffic study or waiver request. In accordance with the Standard Design Criteria and Standard Construction Requirements.
2. Site plan map. The site plan map shall provide information per the site plan application checklist provided by the Planning Director or designee.
3. Demonstrate, in written or graphic form, how the proposed structure is consistent with the Development Standards found in Chapter 5.
4. Final landscape plan per Section 5.04.
5. Provide complete building elevations and perspective rendering, drawn to scale, with illustrations of all colors and identifying major materials to be used in the structures. In addition, Town staff may require building floor plans, sectional drawings, additional perspective drawings, models and/or computer visualizations when the impacts of a proposal warrant such information.

C. *Review and Approval*.

1. Planning Commission Approval.
    a. The Planning Commission shall review the application at a regular meeting. Staff shall present their staff report and recommendation.
    b. The Planning Commission shall either approve, approve with conditions, or deny the application.
2. Town Board consideration of appeals.
    a. The Town Board shall consider any appeal within forty-five (45) days of the close of the appeal period, except an appeal associated with a concurrent development application requiring Town Board review or approval, which the Town Board shall consider with final action on the concurrent development application. The Town Board shall apply the site plan review criteria to either uphold, modify, or reverse the Planning Commission's decision.

D. *Post Decision Actions.* Same as referenced in Section 2.04.3, in addition to the following:

1. Any aggrieved party who wishes to appeal the action shall file a written appeal stating the reasons why the Planning Commission action is incorrect. The applicant shall file the appeal with the Town Administrator/Clerk within seven (7) days of the meeting at which such action was taken.

E. *Post Decision Actions.* Same as referenced in Section 2.04.3, in addition to the following:

1. Memorandum of Agreement for Public Improvements. Staff may require that the applicant execute a MOAPI to assure the construction of on-site and off-site improvements as a condition of approval of the site plan. Guarantees in the site plan agreement shall be secured by an irrevocable letter of credit in an amount determined appropriate by Town staff.
2. Building permit. A building permit shall be issued only when final site plan drawings have been submitted, reviewed, and approved by the Department directors.
    a. Exception. A building permit may be issued for the construction of a foundation and shell only for commercial and industrial uses to allow for the partial construction of a speculation building with unknown tenant and use.
3. Certificate of Occupancy. When building construction and site development are completed in accordance with the approved site plan and building permits, a Certificate of Occupancy may be issued.
4. Phasing and expiration of approval. The site plan shall be effective for a period of three (3) years from the date of approval, unless stated otherwise in the written site plan approval. Building permits shall not be issued based on site plans that have an approval date more than three (3) years old. For multi-phased plans, building permits shall not be issued based on an approval date more than three (3) years from the date of Phase I approval.

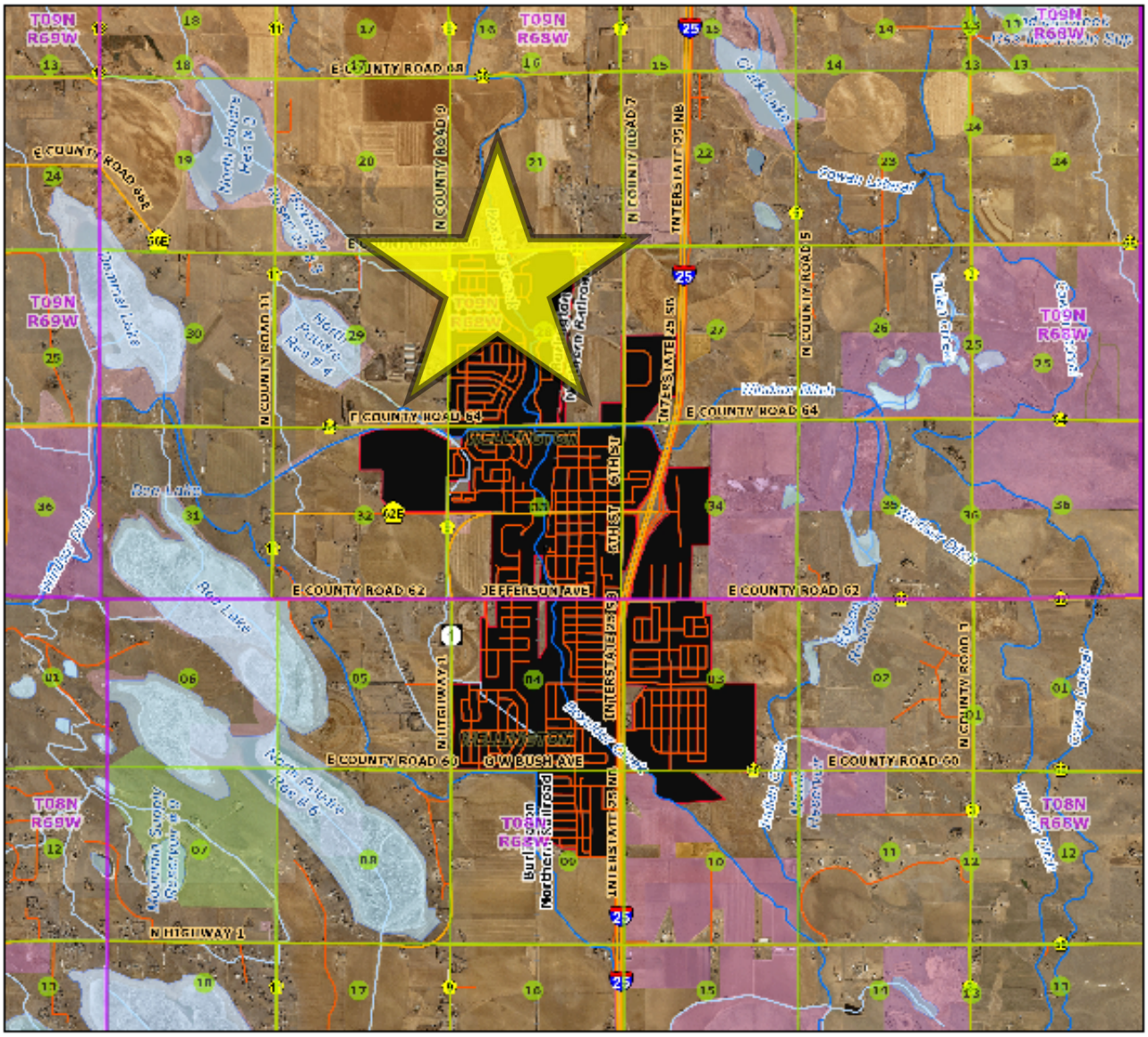
2.12.3 Findings for Approval.

A. The site plan is consistent with the Comprehensive Plan and the intent stated in this Land Use Code.
B. The lot size and lot dimensions are consistent with what is shown on the approved final plat.
C. No buildings or structures infringe on any easements.
D. The proposed site grading is consistent with the requirements of any applicable adopted storm drainage criteria or master drainage plans.
E. The density and dimensions shown conform with Article 4 of this Code or the approved PUD requirements.
F. The applicable Development Standards have been adequately addressed and the proposed improvements conform with Article 5 of this Code.

2.12.4 Amendments to Approved Site Plans.

A. Minor variations in the location of structures, improvements or open space areas caused by engineering or other unforeseen difficulties may be reviewed and approved by the Town staff. Such changes shall not exceed ten percent (10%) of any measurable standard or modify the use, character, or density of an approved site plan. All plans so modified shall be revised to show the authorized changes and shall become a part of the permanent records of the Town.
B. Changes to approved site plans that exceed the ten percent (10%) threshold, or other major modifications (such as changes in building size or footprint, relocation of access points, changes to required parking, etc.), shall be considered as a new site plan application. Such amendments shall require Planning Commission review and approval to become effective. A complete site plan application shall be prepared and submitted in compliance with the requirements set forth in this Section.

CONNELL RESOURCES
LOCATION MAP



Legend			Notes
PLSS Township and Range	Rocky Mountain National Park	Green: Band_2	
PLSS Sections	Incorporated Areas	Blue: Band_3	
Railroads	City or Town	COLARI21-SID-AW-6INCH.sid	
Major Road System	County	Red: Band_1	
Road System	State	Green: Band_2	

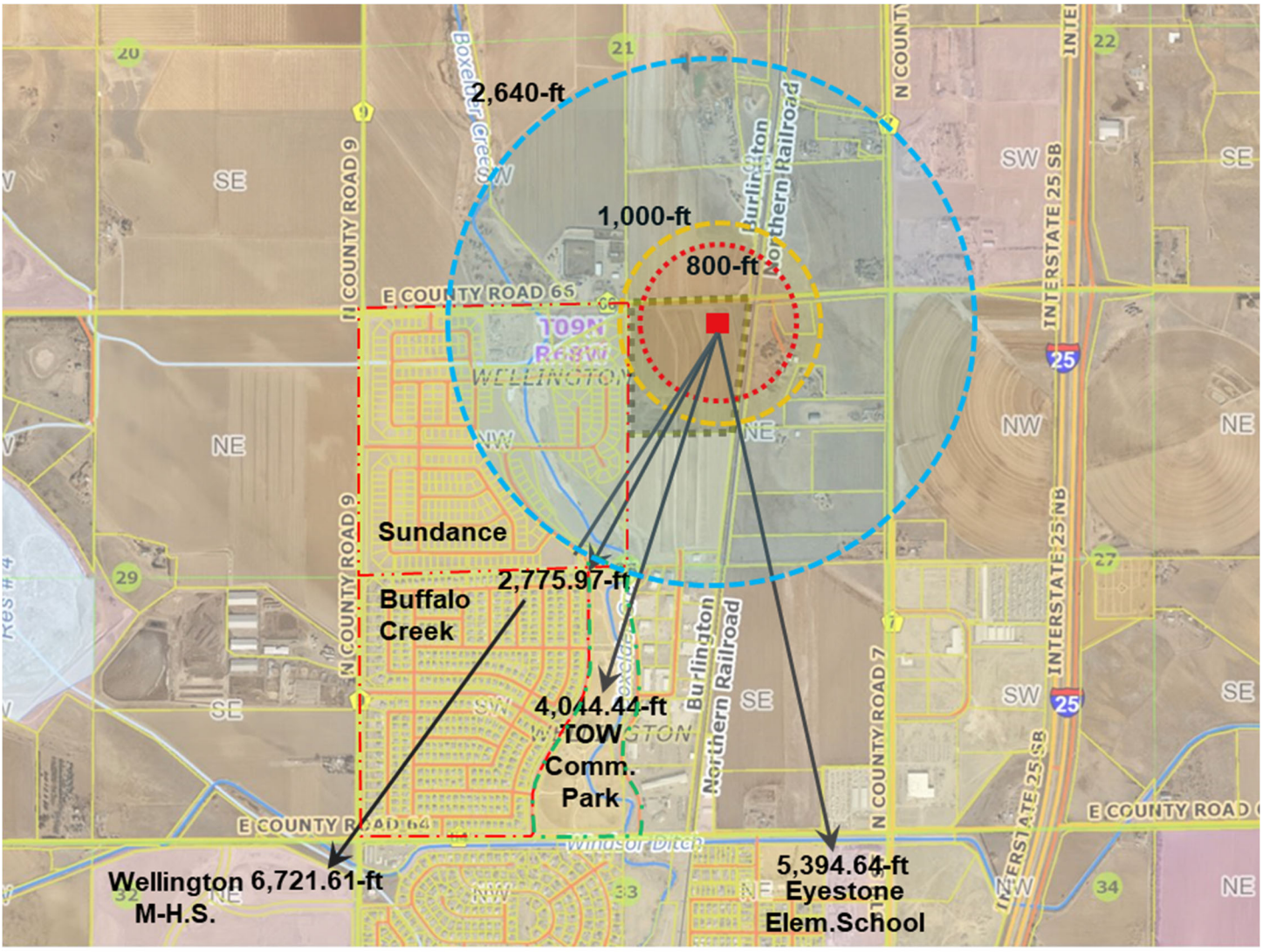
0.6 0 0.6 Miles

Scale 1:50,000

Date Prepared: 1/13/2023 3:20:35 PM

This map was created by Larimer County GIS using data from multiple sources for informal purposes only. This map may not reflect recent updates prior to the date of printing. Larimer County makes no warranty or guarantee concerning the completeness, accuracy, or reliability of the content represented.

Site Separation Exhibit



CONNELL RESOURCES SITE PLAN:

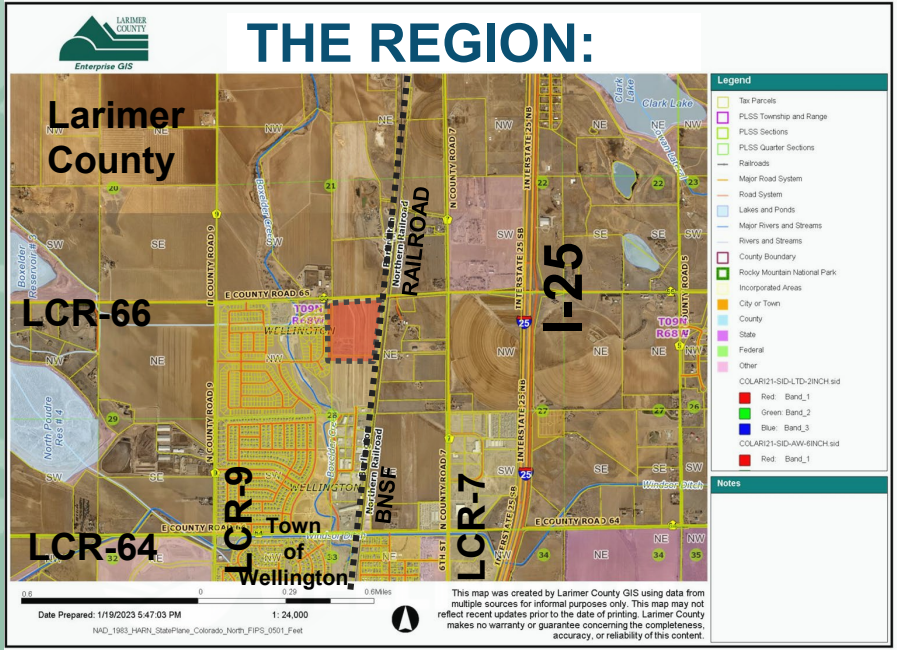
BNSF Railroad & Larimer County Road 66

June 5, 2023 (Continued from May 1, 2023)

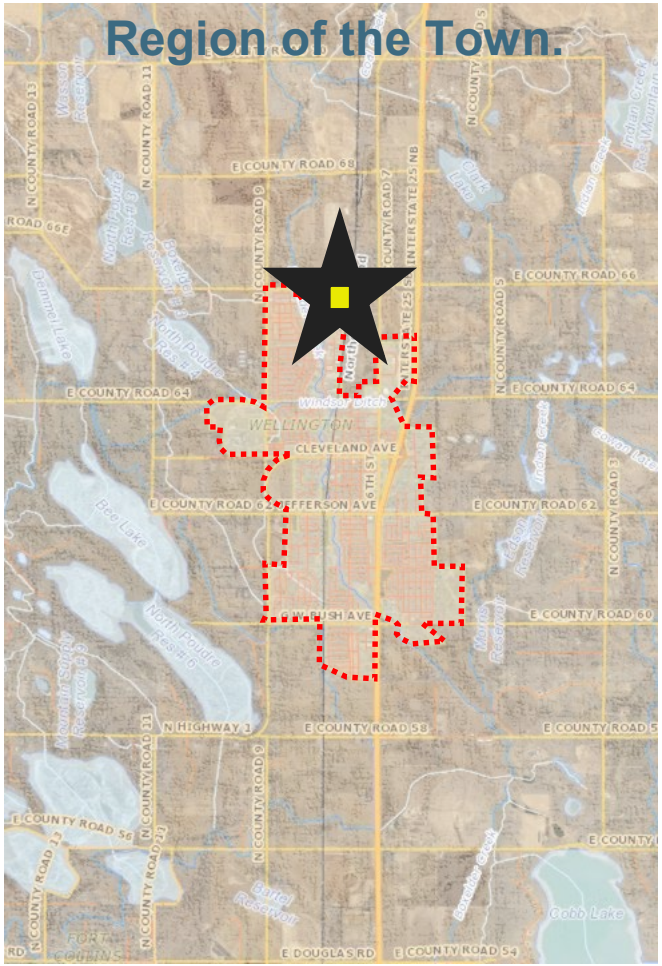
Applicant:
JOHN WARREN,
CONNELL RESOURCES

TOWN OF WELLINGTON

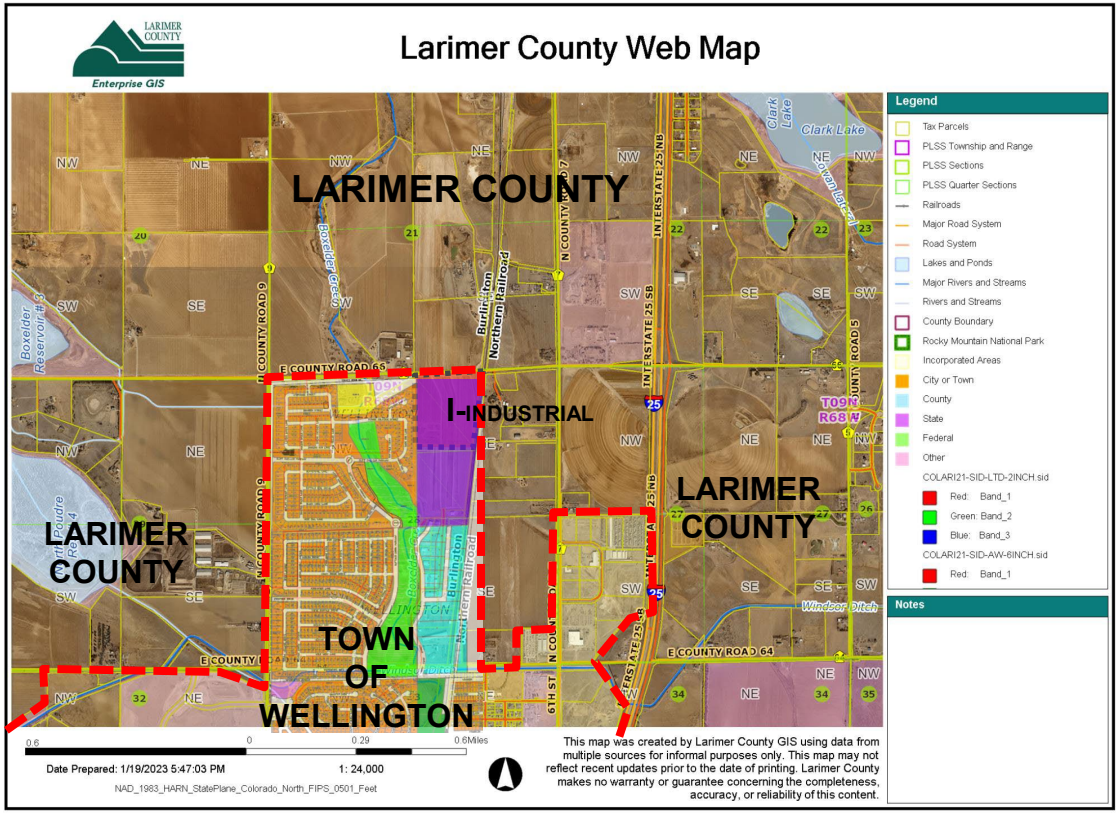
THE REQUEST:
Approval for a Site Plan in the Industrial Zone District



Located in the North Central Region of the Town.



THE ZONING:



- ✓ **THE 35.56-ACRE SITE IS ZONED I- INDUSTRIAL WHEN ANNEXED INTO THE TOWN IN 2000.**
- ✓ **AN ASPHALT BATCH PLANT IS A PERMITTED LAND USE WITH USE SPECIFIC STANDARDS, SEC. 4.03.21.**
- ✓ **THE BOARD OF ADJUSTMENTS GRANTED (2) VARIANCES ON 10-27-2022.**
- ✓ **THE BOARD OF ADJUSTMENTS REQUIRED (6) CONDITIONS OF APPROVAL.**

PROJECT INFORMATION

- The Site is Zoned I- Industrial and an Asphalt Batch Plant is a Permitted Land Use with Use Specific Standards, (Table 4.02 & Sec. 4.03.21).
- The Board of Adjustment granted a variance to reduce the 1,000 ft. separation setback to 800-ft at the 10-27-2023 Board of Adjustment Hearing.
- The Board of Adjustment granted a variance for a 70-ft silo structure height (from 45-ft) at the 10-27-2023 Board of Adjustment Hearing.

The Board of Adjustment required Six Conditions of Approval for the (2) variance requests.

1. Site Plans must be reviewed and approved by the Planning Commission;
2. The height variance (up to 70-ft) is for the silo only;
3. A 15-foot earthen berm and landscaping is required on the west side;
4. There is to be no signage on the silo;
5. Require signage and operator policies to disallow engine braking (“Jake Brakes”);
6. Compliance with all applicable County and State permits for operation of an Asphalt Plant

BOA recommended Town-supplied potable water should not be used for plant process operations.

MARCH 6TH PLANNING COMMISSION

- ❑ **Site Plan Application presented to Planning Commission**
- ❑ **Planning Commission heard request and public testimony**
- ❑ **Planning Commission tabled item pending additional information**

  - ➢ **Items for additional consideration:**
    - Air Dispersion Model and Air Emission Characterization *(Larimer County Health)*
    - Emission Standards and Regulatory Agencies *(Larimer County Health)*
    - Consideration of Adequate Separation and Setbacks *(Town)*
    - Traffic Impact Study *(Town)*
    - Noise Level Data and Information *(Applicant)*
    - Health and Environment Impacts *(Applicant)*
    - Consideration of Groundwater Impacts and Monitoring *(Applicant)*
    - Architectural Character and Building Elevations *(Town)*

PLANNING COMMISSION REVIEW:

2.12. Site Plan

- The Planning Commission is the final review and decision-making authority for site plans.
- Consideration of Findings for Approval
- The Planning Commission may take one of the following actions:
    - Approve the site plan;
    - Approve the site plan with conditions of approval;
    - Deny the site plan application.

SITE PLAN REVIEW FINDINGS FOR APPROVAL:

2.12.3 Findings for Approval.

A. The site plan is consistent with the Comprehensive Plan and the intent stated in this Land Use Code.

B. The lot size and lot dimensions are consistent with what is shown on the approved final plat.

C. No buildings or structures infringe on any easements.

D. The proposed site grading is consistent with the requirements of any applicable adopted storm drainage criteria or master drainage plans.

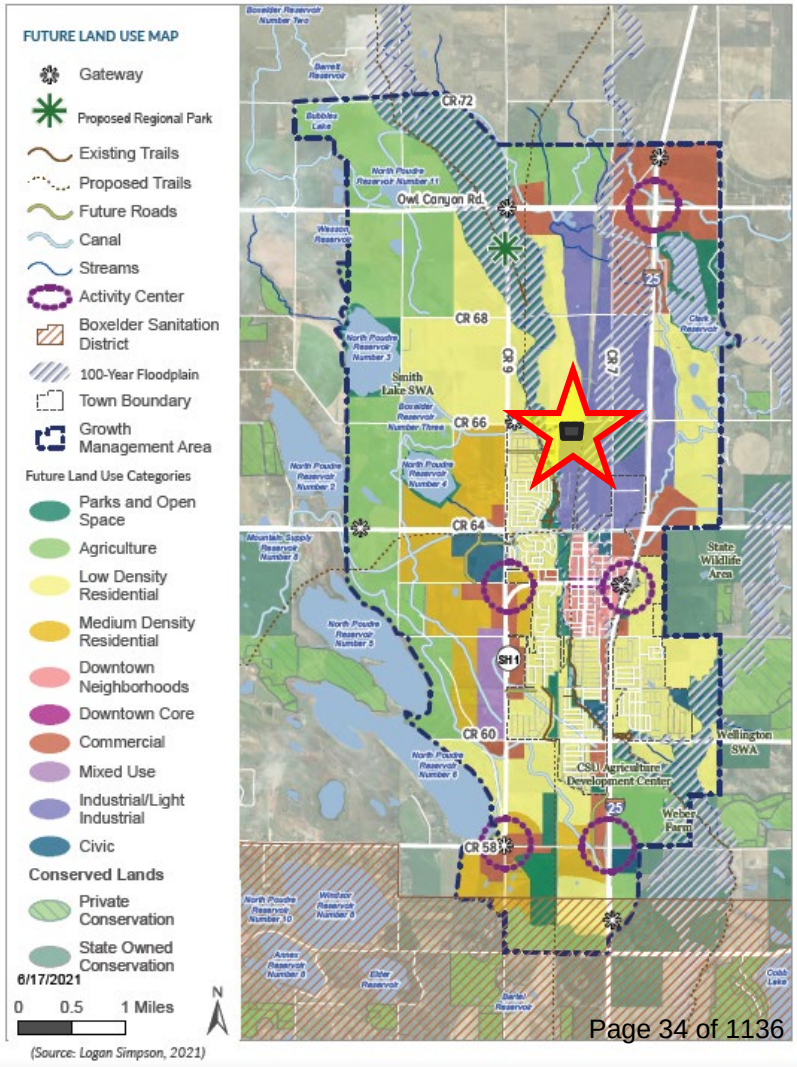
E. The density and dimensions shown conform with Article 4 of this Code or the approved PUD requirements.

F. The applicable Development Standards have been adequately addressed and the proposed improvements conform with Article 5 of the Land use Code.

COMPREHENSIVE PLAN:

TE 2.5 Ensure new industrial developments are consistent with the Town's infrastructure master plans and the Town's water efficiency plan.

TE 4.1 Balance residential with commercial land uses to promote local job opportunities and needed services for residents.

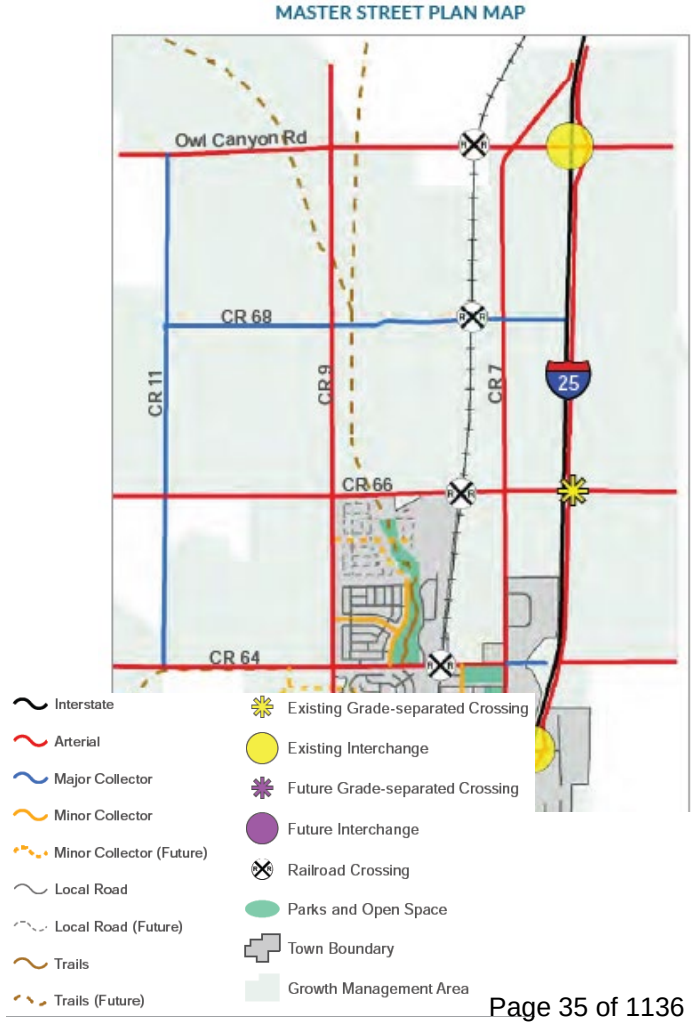


(Source: Logan Simpson, 2021)

COMPREHENSIVE PLAN:

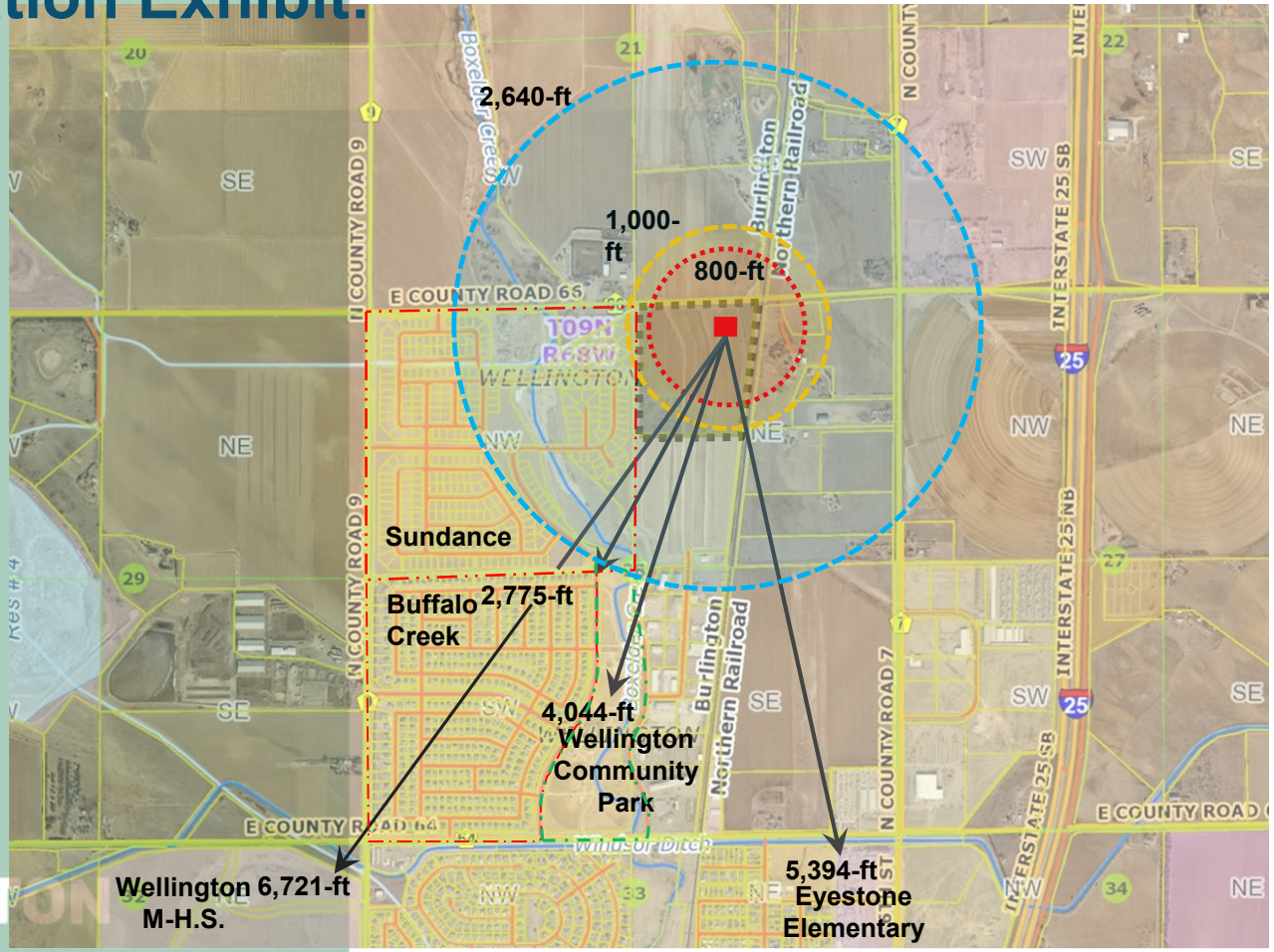
CP 2.6 Identify partners and resource to build a campaign to promote air quality in and around Wellington to ensure air quality is maintained as Wellington and the North Front Range continues to grow.

F&P. 2.3. Require new development to demonstrate how they will connect to and improve the existing networks for active transportation, vehicular traffic, open space and parks, and essential infrastructure for water, wastewater, and stormwater.



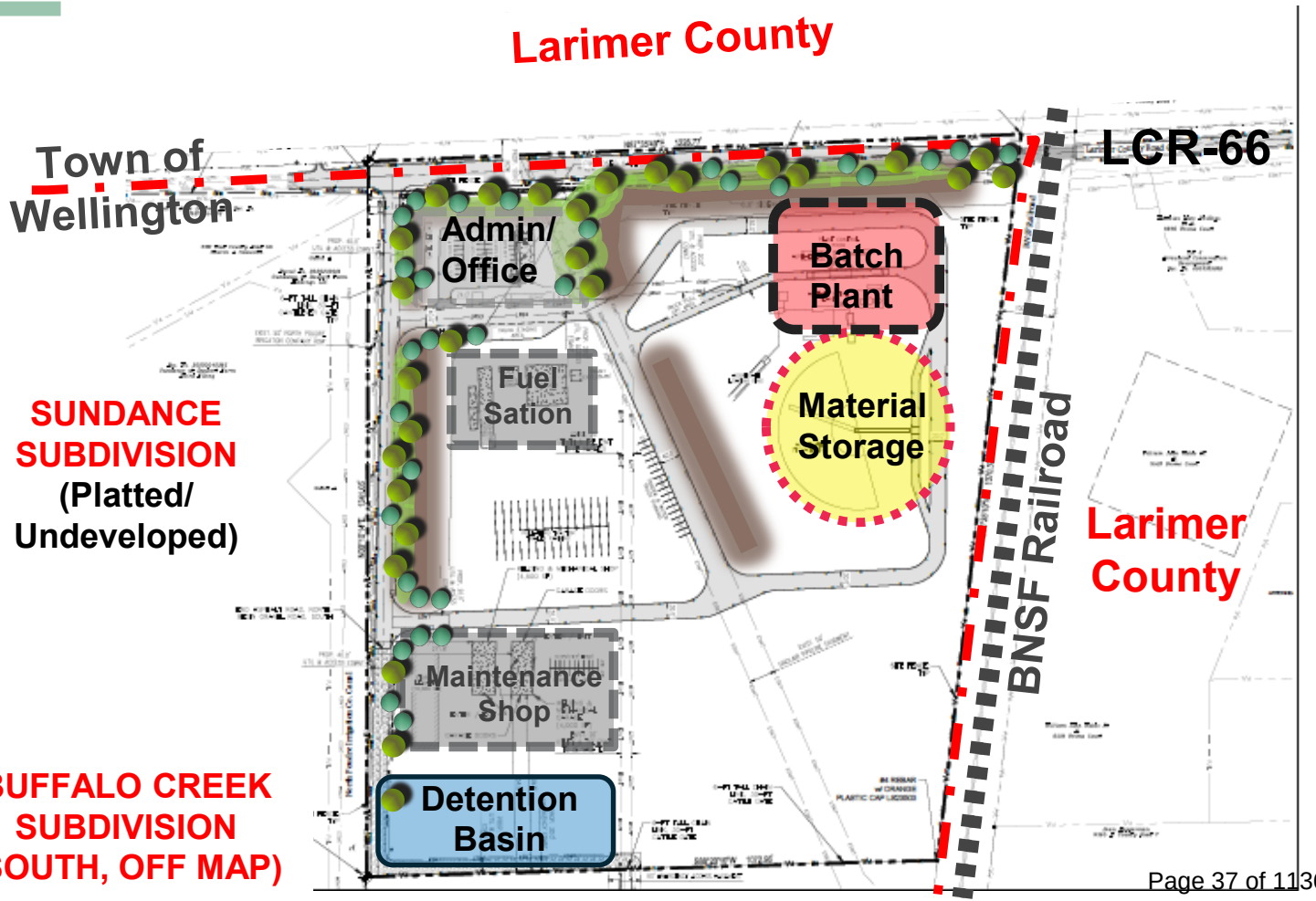
Setback Separation Exhibit:

- 5,394 ft. to Eyestone Elementary School
- 6,721 ft. to Wellington Middle-High School
- 2,775 ft. to Buffalo Creek Subdivision
- 947 ft. to Sundance Subdivision



TOWN OF WELLINGTON

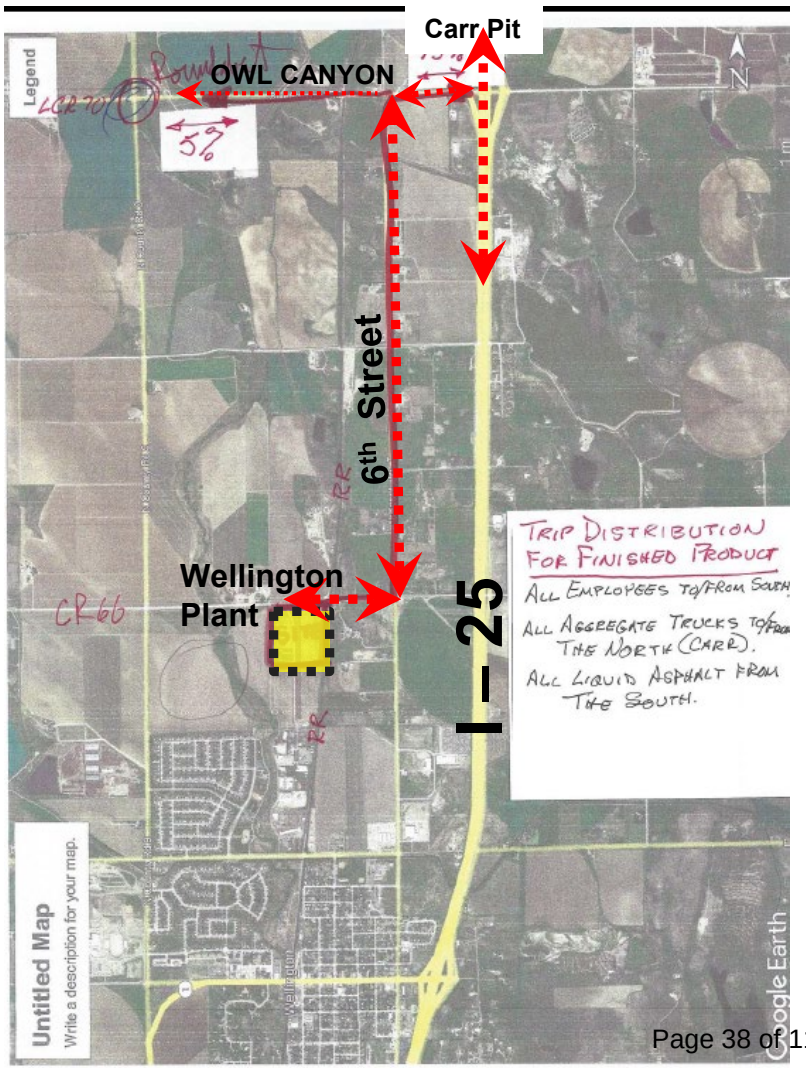
SITE PLAN:


Larimer County
Town of Wellington
LCR-66
Admin/ Office
Batch Plant
Fuel Sation
Material Storage
SUNDANCE SUBDIVISION (Platted/ Undeveloped)
BNSF Railroad
Larimer County
Maintenance Shop
Detention Basin
BUFFALO CREEK SUBDIVISION (SOUTH, OFF MAP)

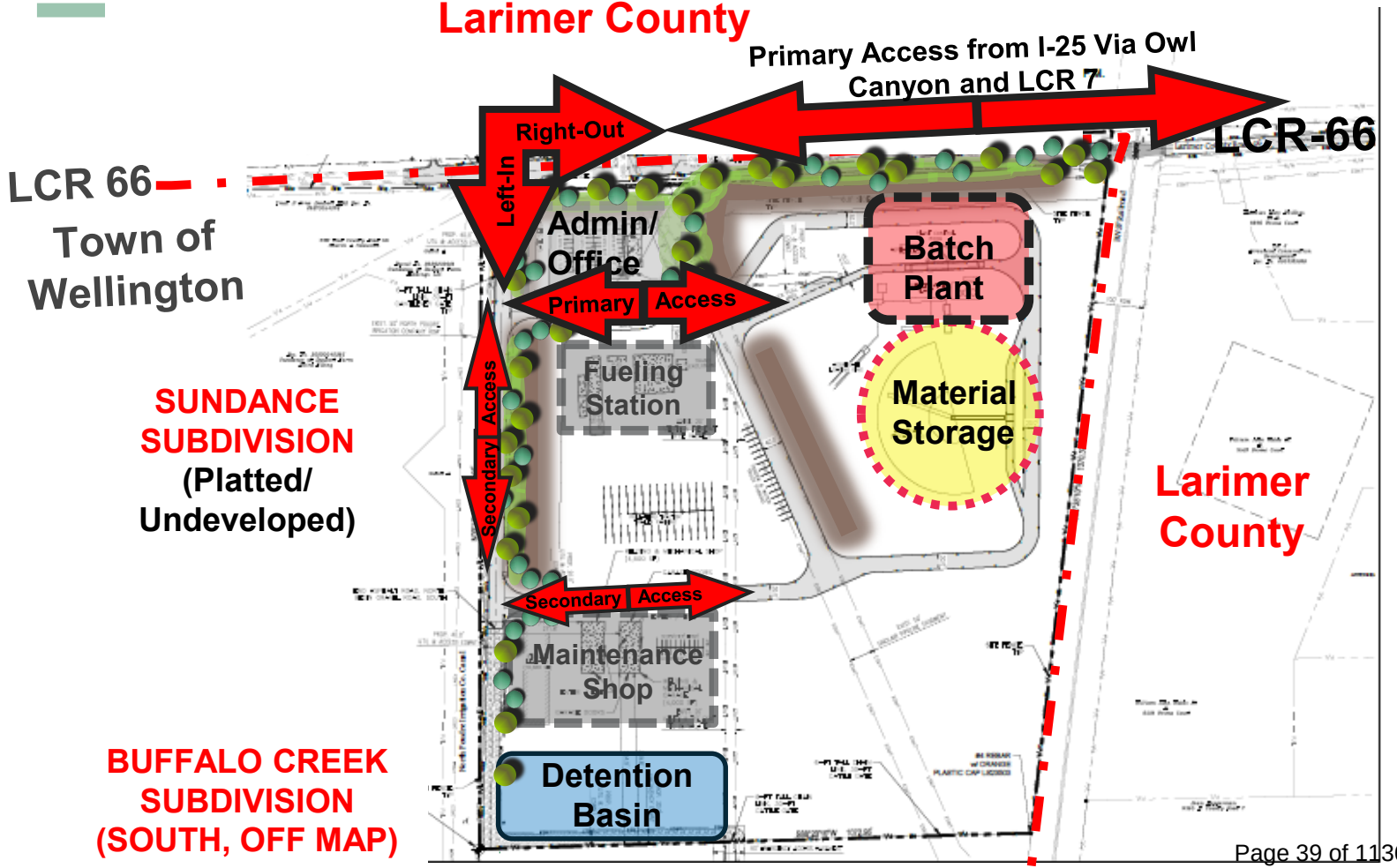
TRAFFIC PATTERNS:

- **Aggregate Trucks: (64 Trips)**
  (32 Loads/Day To Carr & Back)
- **Liquid Asphalt Trucks: (6 Trips)**
  (3 Loads/Day)
- **Employee Trips: (112 Trips)**
  (52 Employees arriving 8:00AM & Leaving 5:00PM)
- **Product Delivery Trucks: (72 Trips)**
- **(36 Trips/Day)**

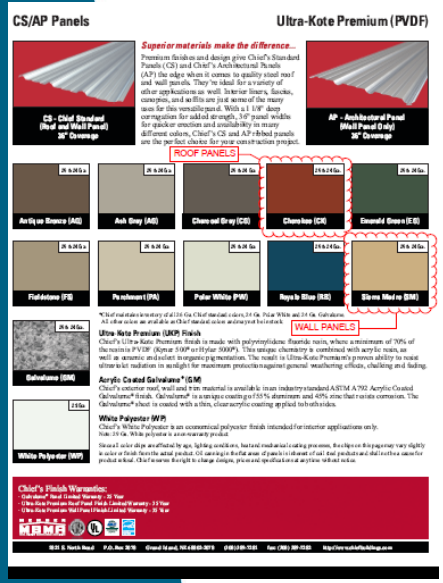
- **Total Daily Trips: 254**
- **95% (242) Trips - North/Owl Canyon Road)**
- **5%(12) Trips - west Owl Canyon Road)**



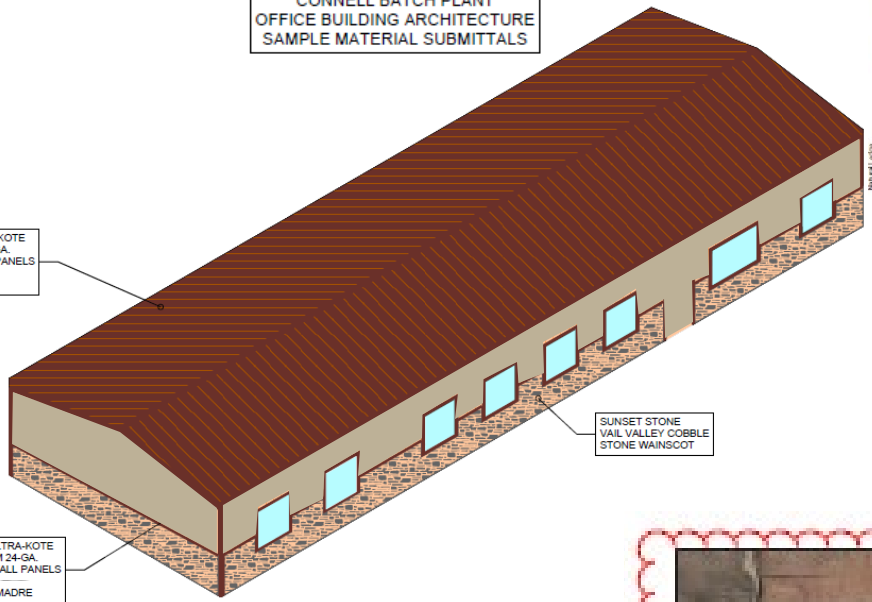
TRUCK ROUTING PLAN:

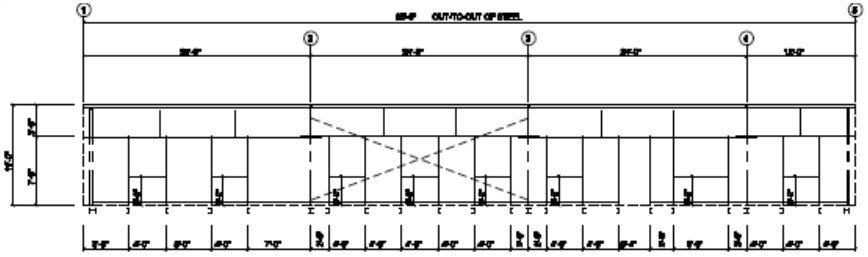


ARCHITECTURAL CHARACTER:



CONNELL BATCH PLANT
OFFICE BUILDING ARCHITECTURE
SAMPLE MATERIAL SUBMITTALS





ARCHITECTURAL CHARACTER:

STAFF ASSESSMENT:

- The Site is Zoned I- Industrial and an Asphalt Batch Plant is a Use by Right with Use Specific Standards in the I-Zone District (Table 4.02 & Sec. 4.03.21).
- The Board of Adjustment granted a variance to reduce the separation setback to 800-ft at the 10-27-2023 Board of Adjustment Hearing.
- The Board of Adjustment granted a variance allowing an up to 70-ft silo structure height at the 10-27-2023 Board of Adjustment Hearing.
- The Town's Site Plan procedures, Section 2.12 have been followed (pending final revisions if site plans are approved by Planning Commission).
- The Board of Adjustment required Six Conditions of Approval (with 1 Recommendation) – Conditions have been adequately addressed and resolved on the site plans.
- The Applicant conducted studies and assessments of the site operations in accordance with Larimer County Health Department recommendations and applicable guidelines.
- The Applicant agrees to operate the site in general compliance with all applicable Federal, State, County and Town requirements.
- The Applicant shall maintain all licenses, certificates and registrations in "Good Standing" with each pertinent agency.

ditesco
Project & Construction Services

2133 S. Timberline Rd, Ste. 110
Fort Collins, CO 80525
ditescoservices.com

November 14, 2022

Mr. Cody Bird, AICP
Planning Director
Town of Wellington
8225 Third Street
Wellington, CO 80549

RE: Connell Batch Plant
Site Plan Application

Dear Mr. Bird –

This letter follows recent coordination on the submittal of the Site Plan Application for the construction of Connell Resources, Inc. (Connell) Asphalt Batch Plant (Batch Plant). The Batch Plant is planned to be constructed along County Road 66, between County Road 7 and County Road 9, immediately west of the Burlington Northern Santa Fe (BNSF) Railroad Tracks. Included with this letter are full submittal documentation, as outlined on the Site Plan Application checklist.

This letter is intended to specifically address items on the Site Plan Application checklist and specific areas of concern identified by Wellington staff, as listed and described in detail below.

Utility Plans – Existing Water Main

The Town of Wellington (Town) has an existing 16-inch C900 PVC waterline routed through the proposed Connell Batch Plant site. This property contains an existing easement, recorded in 2003, for the construction and maintenance of the waterline across the property, applicable to the current Grantee, successors and assigns. In the easement document, with records number 20030053554, states the following:

> *"…permanent non-exclusive utility easement twenty (20) feet in width for the installation, construction, maintenance, inspection, operation, replacement, or removal of utilities… in, over, across, and upon the real property legally described…"*

The location of roadways, building placement, and uses of the site have been completed with the Town's interest in mind, to protect and honor the existing easement. The utility easement across the property restricts the impediment of physical structures on the waterline and allows the Town access for maintenance of the utility. The existing waterline will be protected by a paved asphalt roadway on a portion of the site, and a flowfill cap in other areas.

Additionally, Connell is proposing to install an eight-inch waterline loop that will allow for future connectivity to the future Sundance property to the west. This waterline loop will be installed at Connell's cost and will be deeded to the Town for future expansion of the system, as desired, will improve water quality for the Town, and will reduce the need for a waterline tap on the Town's transmission main.

Utility Plans – Sanitary Sewer

At a meeting on October 20, 2022, the Town requested the sanitary sewer line be relocated to the west access road for future accessibility and maintenance of the line. The sanitary sewer line has been relocated to the west, per the Town's request. The sanitary sewer line is sized at the minimum necessary for the site use by Connell. If the Town desires to increase the size of the sanitary sewer system, the Town shall provide guidance on the revised sizing and cost-sharing program for increase in sanitary sewer size.

Roadway Improvements

The Traffic Impact Study (TIS), included with this application, identifies the addition of a right turn lane on north-bound CR 7, turning onto Owl Canyon Road. These roadway improvements are planned to be completed by Larimer County Engineering in 2023. As such, this construction has not been included within these documents. A copy of the preliminary construction drawings is attached to this letter in **Exhibit A**.

Further, the TIS does not require any additional features for County Road 66. In order to improve the quality of County Road 66, between BNSF and County Road 7, roadway improvements are proposed to minimize a vertical site curve obstruction immediately east of the BNSF tracks. These improvements will be maintained outside of the floodplain. The site plan also depicts that County Road 66 will be asphalt paved, although not mandated by the TIS.

Site Buildings

Connell's proposed site plan includes the construction of an office building, vehicle maintenance shop, ancillary vehicle shop, and lean-to structure. These structures are in a preliminary phase of design and elevations of these structures are not developed. Square-footages and finish floor elevations of each building are noted on the site plan. Color palettes for site buildings are not yet defined, but are intended to match the natural colors of the site.

Connell's office building is anticipated to have 26-gauge steel walls and roof, with a stone/brick wainscot. Connell anticipates maximizing natural light and will have windows on all four elevations of the building. The primary entrance to the building will be oriented to the west, facing the employee parking area.

Connell's vehicle shop buildings and lean-to storage structure are anticipated to have 26-gauge steel walls and roof. Both structures are anticipated to have translucent panels installed on a portion of the facility to maximize natural light into the building.

Photometrics

The proposed photometrics for the site are in preliminary design and a photometrics plan has not been included with this submittal. The site will have minimal lighting in effort to reduce light pollution to surrounding residential areas. The office and shops will have small, wall mounted fixtures and the batch plant will have several mounted lights. The batch plant and site will not have night operations, and therefore all lighting will be limited to employee safety and sight security.

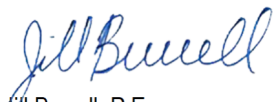
Site Access & Emergency Easements

The property abutting the south edge of the proposed property contains an existing emergency access easement, as identified on the attached documents and by records number 20050095592. The emergency access easement terminates at the proposed property southern property line and does not currently extend across the site.

Per the discussions at the October 20, 2022 meeting, as requested by Town staff, emergency access gates and temporary road-base roadway has been added to the southwest corner of the site. This roadway will be able to be utilized for emergency vehicles accessing the site. Connell will dedicate an emergency access easement of 20-ft in this area and install Knox boxes on access gates to allow continuous emergency access from the property to the south, north to County Road 66.

If you have any questions regarding this supplemental information, please contact me at 970-690-1889 or jill.burrell@ditescoservices.com.

Sincerely,



Jill Burrell, P.E.

Enclosed: **Exhibit A** – Larimer County Engineering CR7/Owl Canyon Road Construction Drawing

ditesco
Project & Construction Services

T R A N S M I T T A L (Site Plan Application)

NO. 02

TO: Paul Whalen
Senior Planner
Town of Wellington
8225 Third Street
Wellington, CO 80549

PROJECT: Connell Batch Plant – Site Plan Resubmittal

Date Submitted: February 10, 2023

TRANSMITTED: Site Plan Application and Associated Documents

☐	Shop Drawings	☐	Catalogs	☐	Price Proposal
☐	Prints	☑	Plans	☐	Product Samples
☐	Specifications	☐	Copies	☑	Other

☐	For Approval	☑	For Your Review	☐	As Requested
☐	For Your Use				
☐	Approved As Submitted	☐	Approved As Noted	☐	Resubmit
☐	Return for Correction	☐	Prints Returned		
☐	Submit Copies for Distribution				
☐	Return Corrected Prints				
☐	Other				

Paul –

We are pleased to resubmit the Site Plan Application and the associated documents for the Connell Batch Plant. The submittal contains the following documents:

- Site Plan Application - Updated
- Site Plan Drawing Package
    - Site Plan
    - Utility and Grading Plans
    - Drainage Exhibit
    - Landscape Plans
    - Irrigation Plans
    - Photometrics Plan
- Office Building Drawings and Architectural Samples
- Site Lighting Cut Sheets
- Comment Response Log

Please do not hesitate to contact me if you have any questions or concerns. I can be reached by email at dan.egger@ditescoservices.com or by phone at (719) 964-0973.

Thanks,

2/10/23

SIGNED: Dan Egger, Ditesco Services Date

RECEIVED: Town of Wellington Date

SITE PLANS FOR

CONNELL RESOURCES
WELLINGTON BATCH PLANT

LOCATED IN THE NORTHEAST QUARTER OF SECTION 28, TOWNSHIP 9 NORTH, RANGE 68 WEST OF THE 6th P.M.
TOWN OF WELLINGTON, COUNTY OF LARIMER, STATE OF COLORADO

February, 2023

PROJECT LOCATION

VICINITY MAP

NOT TO SCALE

CONTACT INFORMATION

OWNER
Connell Resources, Inc.
John Warren, President
7785 Highland Meadows Parkway #100
Fort Collins, Colorado 80528
(970) 223-3151

CIVIL ENGINEER
Ditesco
Jill Burrell, P.E.
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado 80525
(970) 632-5068

SURVEYOR
Majestic Surveying
Steven Parks, PLS
1111 Diamond Valley Drive,
Suite 104
Windsor, Colorado 80550
(970) 443-0882

GEOTECHNICAL
CTL Thompson, Inc
Chip Ledbetter, P.E.
400 North Link Lane
Fort Collins, Colorado 80524
(970) 206-9455

SHEET INDEX

INDEX NO.	SHEET NO.	DESCRIPTION
COVER AND GENERAL NOTES		
1	C001	COVER SHEET
SITE SHEETS		
2	S1	SITE PLAN
OVERALL EXHIBIT SHEETS		
3	C103	OVERALL SITE, UTILITY AND GRADING PLAN
SITE AND HORIZONTAL CONTROL SHEETS		
4	C201	SITE AND HORIZONTAL CONTROL PLAN
5	C202	SITE AND HORIZONTAL CONTROL PLAN
6	C203	SITE AND HORIZONTAL CONTROL PLAN
7	C204	SITE AND HORIZONTAL CONTROL PLAN
8	C205	LINE & CURVE DATA AND POINT TABLE
GRADING AND UTILITY SHEETS		
9	C301	UTILITY AND GRADING PLAN
10	C302	UTILITY AND GRADING PLAN
11	C303	UTILITY AND GRADING PLAN
12	C304	UTILITY AND GRADING PLAN
DRAINAGE EXHIBIT SHEETS		
13	C401	DEVELOPED DRAINAGE EXHIBIT
LANDSCAPE SHEETS		
14	L01	COVER SHEET
15	L02	LANDSCAPE PLAN NORTHEAST
16	L03	LANDSCAPE PLAN NORTHWEST
17	L04	LANDSCAPE PLAN MIDDLE EAST
18	L05	LANDSCAPE PLAN MIDDLE WEST
19	L06	LANDSCAPE PLAN SOUTH EAST
20	L07	LANDSCAPE PLAN SOUTH WEST
21	L08	LANDSCAPE PLAN SOUTH
22	L09	LANDSCAPE DETAILS
IRRIGATION SHEETS		
23	IR1.0	IRRIGATION PLAN
24	IR1.1	IRRIGATION PLAN
25	IR1.2	IRRIGATION PLAN
26	IR1.3	IRRIGATION PLAN
27	IR2.1	IRRIGATION DETAILS
PHOTOMETRICS SHEETS		
28	P101	PHOTOMETRICS PLAN
29	P102	PHOTOMETRICS SCHEDULE

BENCHMARKS

Coordinate Control

VERTICAL DATUM:
PROJECT DATUM: NAVD88

BENCHMARK: NGS R-356 Reset (2002)

ELEVATION: 5221.20 (NAVD88)

HORIZONTAL DATUM:
MODIFIED COLORADO STATE PLANE NORTH ZONE 0501 (GROUND) COORDINATES NAD 83(2011) DATUM. HORIZONTAL CONTROL BASED UPON TRIMBLE VRS NETWORK SOLUTION.

THIS DRAWING IS AT MODIFIED STATE PLANE. TO REDUCE TO STATE PLANE COORDINATES, SCALE X,Y,ONLY AT 0.999742580 (1.000257486) ABOUT THE ORIGIN 0,0.

CALL UTILITY NOTIFICATION CENTER OF COLORADO
811
Know what's below.
Call before you dig.
CALL 2 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

ditesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado 80525
Phone: 970.632.5068
www.ditescoservices.com

P.E. Seal

Sheet Revisions

No.	Revisions:	By	Date:

COVER SHEET

DATE: February 8, 2023
SCALE: NTS
FILE NAME: Batch Plant Cover.dwg

DESIGNED BY: D. Egger
DRAWN BY: R. Bunner
APPROVED BY: J. Burrell

WELLINGTON BATCH PLANT
CONNELL RESOURCES

PROJECT NUMBER: XXXX

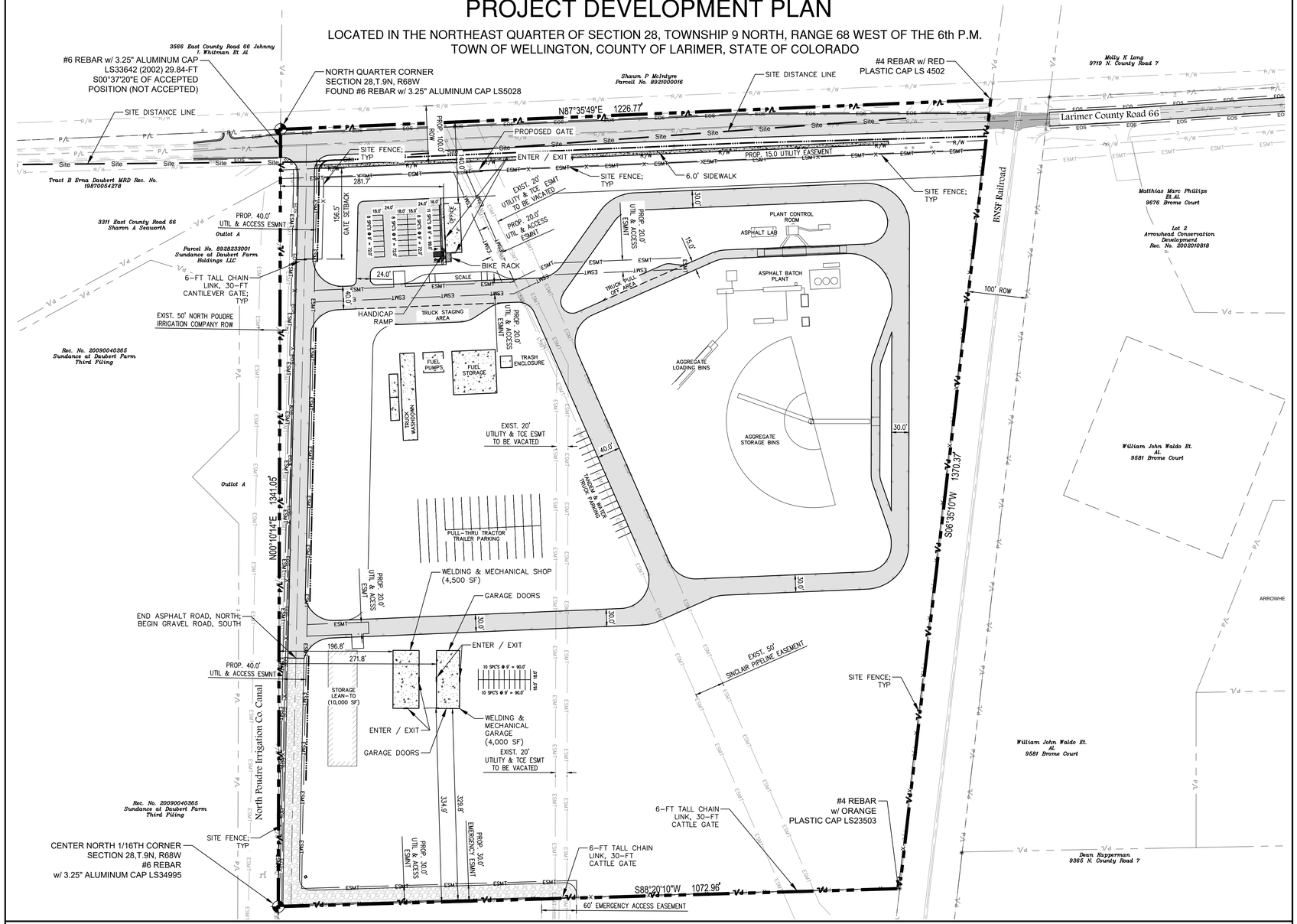
SHEET NUMBER
C001

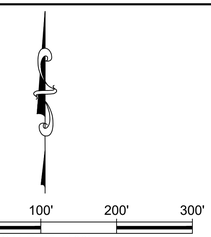
SHEET INDEX: 1

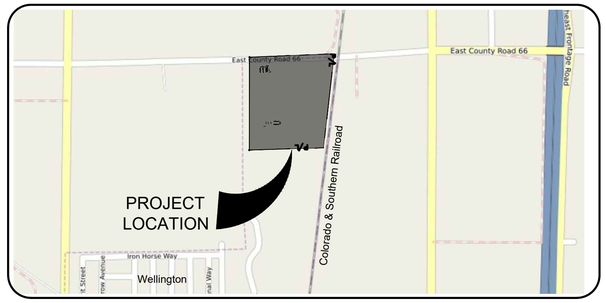
Drawing Name: D:\Projects\Wellington Batch Plant\Dwg\Sheets\Batch Plant Cover.dwg Thursday, February 09, 2023 2:09 PM By: Rhonda Bunner

WELLINGTON BATCH PLANT
PROJECT DEVELOPMENT PLAN

LOCATED IN THE NORTHEAST QUARTER OF SECTION 28, TOWNSHIP 9 NORTH, RANGE 68 WEST OF THE 6th P.M.
TOWN OF WELLINGTON, COUNTY OF LARIMER, STATE OF COLORADO







LEGEND & ABBREVIATIONS

RIGHTS-OF-WAY	ROW	EXISTING RIGHT OF WAY	R/W
TYPICAL	TYP	PROPOSED RIGHT OF WAY	R/W
SQUARE FEET	SF	PROPOSED SWALE	
EASEMENT	ESMT	PROPOSED FENCE	X
PROPERTY BOUNDARY	P/L	PROPOSED SHOULDER	EOS
EDGE OF GRAVEL ROAD		EXISTING EASEMENT LINE	ESMT
PROPOSED EDGE OF ASPHALT		PROPOSED EASEMENT	ESMT
SITE DISTANCE LINE	Site	PLANT ACCESS ROAD (ASPHALT)	
		GRAVEL ROAD	

GENERAL NOTES:

1. REFER TO UTILITY PLANS FOR LOCATIONS OF STORM DRAINAGE STRUCTURES, UTILITY MAINS AND SERVICES.
2. REFER TO CIVIL ENGINEERING PLANS FOR DETAILED INFORMATION OF PROPOSED TOPOGRAPHY, UTILITY, AND STREET IMPROVEMENTS.
3. REFER TO THE CIVIL ENGINEERING FOR EASEMENTS, LOT DIMENSIONS, UTILITY EASEMENTS, OTHER EASEMENTS, AND OTHER SURVEY INFORMATION.
4. ALL CONSTRUCTION WILL BE COMPLETED IN ONE PHASE.
5. ALL SIGNS UTILIZED SHALL COMPLY WITH THE TOWN OF WELLINGTON SIGN CODE.

LAND USE STATISTICS

Lot Coverage and Surfaces

Category	Description	Area (SF)	Area (Acres)	%
Paved		234,025	5.37	15.11
	Parking Lot	17,845	0.41	1.15
	Roads	216,180	4.96	13.96
Buildings		20,880	0.48	1.35
	Office	2,380	0.05	0.15
	Weld Shop	4,500	0.10	0.29
	Weld Garage	4,000	0.09	0.26
	Lean-To	10,000	0.23	0.65
Walk		17,743	0.41	1.15
Undeveloped		1,276,346	29.30	82.40
	Landscaped	269,084	6.18	17.37
	Detention	173,279	3.98	11.19
	Undeveloped	833,983	19.15	53.84
Total		1,548,994	35.56	100.00

Proposed Buildings

Description	Employees	Stories	Floor Area (SF)
Office	13	1	2,380
Welding and Mechanical Shop	3	1	4,500
Welding and Mechanical Garage	0	1	4,000
Storage Lean-To	0	1	10,000

Parking Requirements

	Required	Provided
Standard Spaces	2	32
ADA Spaces	2	2

LEGAL DESCRIPTION

A PARCEL OF LAND SITUATE IN THE NORTHEAST QUARTER OF SECTION TWENTY-EIGHT (28), TOWNSHIP NINE NORTH (T.9N.), RANGE SIXTY-EIGHT WEST (R.68W.) OF THE SIXTH PRINCIPAL MERIDIAN (6THP.M.) BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

ALL THAT PART OF THE NORTHEAST 1/4 OF SECTION 28, TOWNSHIP 9 NORTH, RANGE 68 WEST OF THE 6TH P.M., COUNTY OF LARIMER, STATE OF COLORADO, LYING WESTERLY OF THE C & S RAILROAD RIGHT OF WAY EXCEPT THAT PORTION CONVEYED BY DEED RECORDED NOVEMBER 22, 2004 AT RECEPTION NO. 20040111490.

SAID PARCEL CONTAINS 1,549,362 SQUARE FEET OR 35.568 ACRES MORE OR LESS BY THIS SURVEY.

NOTE

THIS IS A LAND USE PLANNING DOCUMENT, NOT A CONSTRUCTION DOCUMENT. REFER TO CIVIL ENGINEERING PLANS FOR SITE CONSTRUCTION.

OWNER

CONNELL RESOURCES, INC
JOHN WARREN, PRESIDENT
7785 HIGHLAND MEADOWS PARKWAY #100
FORT COLLINS, COLORADO 80528
(970) 223-3151

DEVELOPER/APPLICANT

CONNELL RESOURCES, INC
JOHN WARREN, PRESIDENT
7785 HIGHLAND MEADOWS PARKWAY #100
FORT COLLINS, COLORADO 80528
(970) 223-3151

OWNER'S CERTIFICATION

The undersigned does/do hereby certify that I/we are the lawful owners of real property described on this Site Plan and de hereby certify that I/we accept the conditions and restrictions set forth on said Site Plan.

Connell Resources, Inc. Date

The foregoing instrument was acknowledged before me

This _____ day of _____ A.D., 20_____ by

(Print Name)

as _____

My Commission Expires: _____

Witness my hand and official seal

Notary Public Address

PLANNING AND ZONING CERTIFICATE

Approved by the Planning and Zoning Board of the Town of Wellington, Colorado, on this _____ day of _____ , 20___.

Secretary of Planning and Zoning Board

dtesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado 80525
Phone: (970) 226-0860
www.dtescoservices.com

P.E. Seal

Sheet Revisions

No.	Revisions:	By:	Date:

SITE PLAN

DESIGNED BY: D. Egger
DRAWN BY: R. Bunner
APPROVED BY: J. Burrell

DATE: February 8, 2023
SCALE: 1" = 100'
FILE NAME: Batch Plant Site Plan.dwg

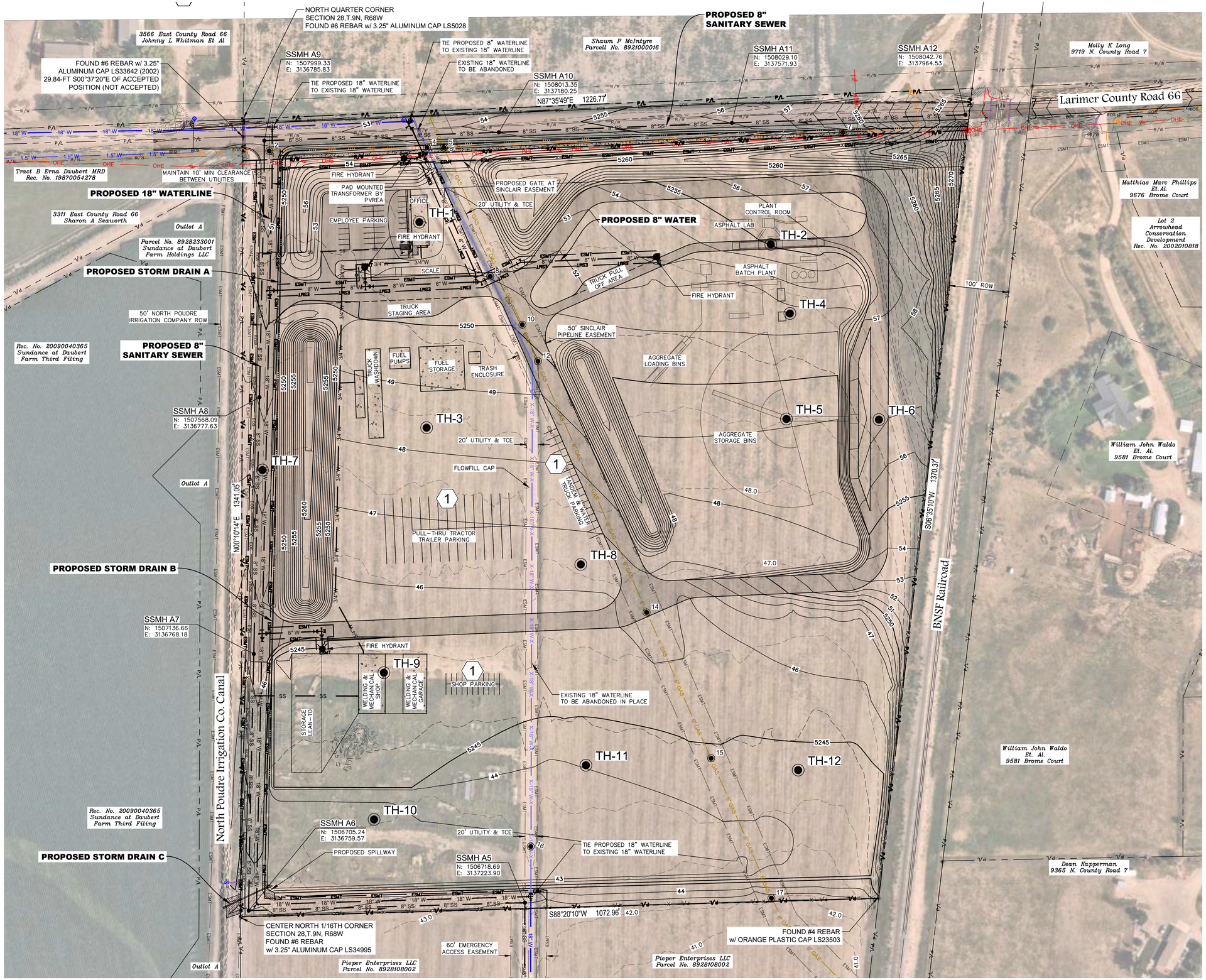
WELLINGTON BATCH PLANT
CONNELL RESOURCES

PROJECT NUMBER: XXXX

SHEET NUMBER
S1

SHEET INDEX: 2

Drawing Name: D:\Projects\Wellington Batch Plant\Dwg\Sheets\Batch Plant Site Plan.dwg Wednesday, February 08, 2023 5:04 PM By: Rhonda Bunner



Drawing Name: D:\Projects\Wellington Batch Plant\Dwg\Sheets\Batch Plant OA Site Grading.dwg Wednesday, February 08, 2023 5:12 PM By: Rhonda Bunner

80' 0 80' 160' 240'

SCALE: 1" = 80'
(True scale for 22x34 sheet size)

LEGEND:

- EXISTING CONTOURS — 4987
- PROPOSED CONTOURS — 4987
- SITE PROPERTY LINE — P/L
- EXISTING RIGHT OF WAY — R/W
- PROPOSED RIGHT OF WAY — R/W
- PROPOSED EDGE OF ASPHALT
- PROPOSED EDGE OF SHOULDER — EOS
- EDGE OF GRAVEL ROAD
- PROPOSED SWALE
- PROPOSED CHAIN LINK FENCE
- PROPOSED 2-STRAND BARB-WIRE — X
- EXISTING EASEMENT — ESMT
- PROPOSED EASEMENT — ESMT
- EXISTING WATER — 18" W
- PROPOSED WATER — 8" W
- PROPOSED 3/4" WATER SERVICE — 3/4"W
- EXISTING SANITARY SEWER — 8" SS
- PROPOSED SANITARY SEWER — 8" SS
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- EXISTING OVERHEAD ELECTRIC — OHE
- EXISTING SINCLAIR GASOLINE PIPELINE — 6" GAS
- EXISTING FIBER OPTIC — FO
- EXISTING GATE VALVE
- EXISTING WATER MANHOLE
- EXISTING SANITARY SEWER MANHOLE
- PROPOSED SANITARY SEWER MANHOLE
- PROPOSED FIRE HYDRANT
- PROPOSED GATE VALVE
- PROPOSED THRUST BLOCK
- EXISTING POWER POLE
- EXISTING ELECTRIC BOX
- EXISTING TELEPHONE PEDESTAL
- EXISTING MAILBOX
- PLANT ACCESS ROAD (ASPHALT)
- GRAVEL ROAD
- BORE HOLES — TH2
- UTILITY POTHOLE — 20

NOTES:

1. THE SIZE, TYPE AND LOCATION OF ALL KNOWN UNDERGROUND UTILITIES ARE APPROXIMATE WHEN SHOWN ON THESE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE OF ALL UNDERGROUND UTILITIES IN THE AREA OF THE WORK.
2. ALL SYMBOLS ARE ONLY GRAPHICALLY REPRESENTED AND ARE NOT TO SCALE.

TAG NOTES:

1. PARKING STALLS SHOWN FOR LAYOUT PURPOSES ONLY. STRIPING WILL NOT BE INSTALLED.

dltesco
Project & Construction Services
2139 S. Timberline Road, Suite 110
Fort Collins, Colorado 80525
Phone: 970.530.8625
www.dltescoservices.com

P.E. Seal

Sheet Revisions								
No.	Revisions:	By	Date:					

OVERALL SITE, UTILITY AND GRADING PLAN

DESIGNED BY:	D. Egger
DRAWN BY:	R. Bunner
APPROVED BY:	J. Burrell
DATE:	February 8, 2023
SCALE:	########
FILE NAME:	Batch Plant OA Site Grading.dwg

WELLINGTON BATCH PLANT
CONNELL RESOURCES

CONNELL

PROJECT NUMBER: XXXX

SHEET NUMBER
C103

SHEET INDEX: 3

40' 0 40' 80' 120'

SCALE: 1" =40'
(True scale for 22x34 sheet size)

LEGEND:

- SITE PROPERTY LINE
- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- SITE DISTANCE LINE
- PROPOSED EDGE OF ASPHALT
- PROPOSED EDGE OF SHOULDER
- EDGE OF GRAVEL ROAD
- PROPOSED SWALE
- PROPOSED CHAIN LINK FENCE
- PROPOSED 2-STRAND BARB-WIRE
- EXISTING EASEMENT
- PROPOSED EASEMENT
- EXISTING GATE VALVE
- EXISTING WATER MANHOLE
- EXISTING SANITARY SEWER MANHOLE
- PROPOSED SANITARY SEWER MANHOLE
- PROPOSED FIRE HYDRANT
- EXISTING POWER POLE
- EXISTING ELECTRIC BOX
- EXISTING TELEPHONE PEDESTAL
- EXISTING MAILBOX
- PLANT ACCESS ROAD (ASPHALT)
- GRAVEL ROAD
- BORE HOLES
- UTILITY POTHOLE

NOTES:

1. THE SIZE, TYPE AND LOCATION OF ALL KNOWN UNDERGROUND UTILITIES ARE APPROXIMATE WHEN SHOWN ON THESE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE OF ALL UNDERGROUND UTILITIES IN THE AREA OF THE WORK.
2. ALL SYMBOLS ARE ONLY GRAPHICALLY REPRESENTED AND ARE NOT TO SCALE.

TAG NOTES:

(A) PARKING STALLS SHOWN FOR LAYOUT PURPOSES ONLY. STRIPING WILL NOT BE INSTALLED.

dltesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado 80525
Phone: 970.530.8060
www.dltescoservices.com

P.E. Seal

Sheet Revisions	No.	Revisions:	By	Date:

SITE AND HORIZONTAL CONTROL PLAN

DESIGNED BY:	D. Egger
DRAWN BY:	R. Bunner
APPROVED BY:	J. Burrell
DATE:	February 8, 2023
SCALE:	1" = 40'
FILE NAME:	Batch Plant Site.dwg

WELLINGTON BATCH PLANT
CONNELL RESOURCES

CONNELL

PROJECT NUMBER:
XXXX

SHEET NUMBER
C201

SHEET INDEX: 4

Drawing Name: D:\Projects\Wellington Batch Plant\Dwg\Sheets\Batch Plant Site.dwg Wednesday, February 08, 2023 5:11 PM By: Rhonda Bunner

40' 0 40' 80' 120'

SCALE: 1" =40'
(True scale for 22x34 sheet size)

LEGEND:

- SITE PROPERTY LINE — P/L
- EXISTING RIGHT OF WAY — R/W
- PROPOSED RIGHT OF WAY — R/W
- SITE DISTANCE LINE — Site
- PROPOSED EDGE OF ASPHALT
- PROPOSED EDGE OF SHOULDER — EOS
- EDGE OF GRAVEL ROAD
- PROPOSED SWALE
- PROPOSED CHAIN LINK FENCE
- PROPOSED 2-STRAND BARB-WIRE — X
- EXISTING EASEMENT — ESMT
- PROPOSED EASEMENT — ESMT
- EXISTING GATE VALVE — W.V.
- EXISTING WATER MANHOLE — W.M.
- EXISTING SANITARY SEWER MANHOLE — S
- PROPOSED SANITARY SEWER MANHOLE
- PROPOSED FIRE HYDRANT
- EXISTING POWER POLE
- EXISTING ELECTRIC BOX
- EXISTING TELEPHONE PEDESTAL — T
- EXISTING MAILBOX — M
- PLANT ACCESS ROAD (ASPHALT)
- GRAVEL ROAD
- BORE HOLES — TH2
- UTILITY POTHOLE — 20

NOTES:

1. THE SIZE, TYPE AND LOCATION OF ALL KNOWN UNDERGROUND UTILITIES ARE APPROXIMATE WHEN SHOWN ON THESE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE OF ALL UNDERGROUND UTILITIES IN THE AREA OF THE WORK.
2. ALL SYMBOLS ARE ONLY GRAPHICALLY REPRESENTED AND ARE NOT TO SCALE.

TAG NOTES:

(A) PARKING STALLS SHOWN FOR LAYOUT PURPOSES ONLY. STRIPING WILL NOT BE INSTALLED.

dltesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado 80525
Phone: 970.530.8863
www.dltescoservices.com

P.E. Seal

Sheet Revisions

No.	Revisions:	By	Date:

SITE AND HORIZONTAL CONTROL PLAN

DESIGNED BY:	D. Egger
DRAWN BY:	R. Bunner
APPROVED BY:	J. Burrell
DATE:	February 8, 2023
SCALE:	1" = 40'
FILE NAME:	Batch Plant Site.dwg

WELLINGTON BATCH PLANT
CONNELL RESOURCES

CONNELL

PROJECT NUMBER: XXXX

SHEET NUMBER
C202

SHEET INDEX: 5

Drawing Name: D:\Projects\Wellington Batch Plant\Dwg\Sheets\Batch Plant Site.dwg Wednesday, February 08, 2023 5:11 PM By: Rhonda Bunner

40' 0 40' 80' 120'

SCALE: 1" =40'
(True scale for 22x34 sheet size)

LEGEND:

- SITE PROPERTY LINE — P/L
- EXISTING RIGHT OF WAY — R/W
- PROPOSED RIGHT OF WAY — R/W
- SITE DISTANCE LINE — Site
- PROPOSED EDGE OF ASPHALT
- PROPOSED EDGE OF SHOULDER — EOS
- EDGE OF GRAVEL ROAD
- PROPOSED SWALE
- PROPOSED CHAIN LINK FENCE
- PROPOSED 2-STRAND BARB-WIRE — X
- EXISTING EASEMENT — ESMT
- PROPOSED EASEMENT — ESMT
- EXISTING GATE VALVE — W.V.
- EXISTING WATER MANHOLE — FDS
- EXISTING SANITARY SEWER MANHOLE — S
- PROPOSED SANITARY SEWER MANHOLE
- PROPOSED FIRE HYDRANT
- EXISTING POWER POLE
- EXISTING ELECTRIC BOX
- EXISTING TELEPHONE PEDESTAL — T
- EXISTING MAILBOX — M
- PLANT ACCESS ROAD (ASPHALT)
- GRAVEL ROAD
- BORE HOLES — TH2
- UTILITY POTHOLE — 20

NOTES:

1. THE SIZE, TYPE AND LOCATION OF ALL KNOWN UNDERGROUND UTILITIES ARE APPROXIMATE WHEN SHOWN ON THESE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE OF ALL UNDERGROUND UTILITIES IN THE AREA OF THE WORK.
2. ALL SYMBOLS ARE ONLY GRAPHICALLY REPRESENTED AND ARE NOT TO SCALE.

TAG NOTES:

(A) PARKING STALLS SHOWN FOR LAYOUT PURPOSES ONLY. STRIPING WILL NOT BE INSTALLED.

dltesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado 80525
Phone: 970.530.8625
www.dltescoservices.com

P.E. Seal

Sheet Revisions

No.	Revisions:	By	Date:

SITE AND HORIZONTAL CONTROL PLAN

DESIGNED BY:	D. Egger
DRAWN BY:	R. Bunner
APPROVED BY:	J. Burrell
DATE:	February 8, 2023
SCALE:	1" = 40'
FILE NAME:	Batch Plant Site.dwg

WELLINGTON BATCH PLANT
CONNELL RESOURCES

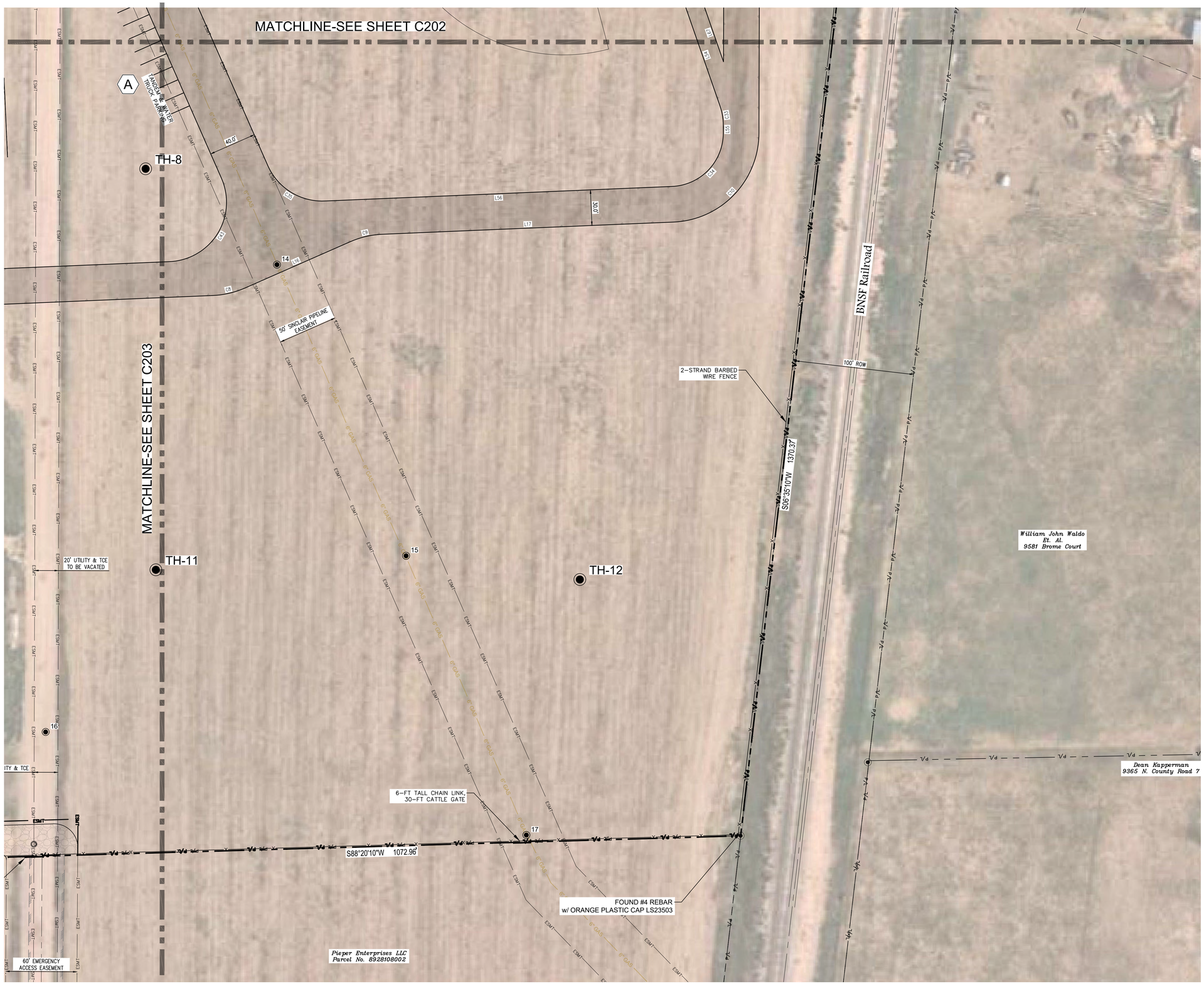
CONNELL

PROJECT NUMBER: XXXX

SHEET NUMBER
C203

SHEET INDEX: 6

Drawing Name: D:\Projects\Wellington Batch Plant\Dwg\Sheets\Batch Plant Site.dwg Wednesday, February 08, 2023 5:11 PM By: Rhonda Bunner



40' 0 40' 80' 120'

SCALE: 1" =40'
(True scale for 22x34 sheet size)

LEGEND:

- SITE PROPERTY LINE — P/L
- EXISTING RIGHT OF WAY — R/W
- PROPOSED RIGHT OF WAY — R/W
- SITE DISTANCE LINE — Site
- PROPOSED EDGE OF ASPHALT
- PROPOSED EDGE OF SHOULDER — EOS
- EDGE OF GRAVEL ROAD
- PROPOSED SWALE
- PROPOSED CHAIN LINK FENCE
- PROPOSED 2-STRAND BARB-WIRE — X
- EXISTING EASEMENT — ESMT
- PROPOSED EASEMENT — ESMT
- EXISTING GATE VALVE — W.V.
- EXISTING WATER MANHOLE — FDS
- EXISTING SANITARY SEWER MANHOLE — S
- PROPOSED SANITARY SEWER MANHOLE
- PROPOSED FIRE HYDRANT
- EXISTING POWER POLE
- EXISTING ELECTRIC BOX
- EXISTING TELEPHONE PEDESTAL — T
- EXISTING MAILBOX — M
- PLANT ACCESS ROAD (ASPHALT)
- GRAVEL ROAD
- BORE HOLES — TH2
- UTILITY POTHOLE — 20

NOTES:

1. THE SIZE, TYPE AND LOCATION OF ALL KNOWN UNDERGROUND UTILITIES ARE APPROXIMATE WHEN SHOWN ON THESE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE OF ALL UNDERGROUND UTILITIES IN THE AREA OF THE WORK.
2. ALL SYMBOLS ARE ONLY GRAPHICALLY REPRESENTED AND ARE NOT TO SCALE.

TAG NOTES:

(A) PARKING STALLS SHOWN FOR LAYOUT PURPOSES ONLY. STRIPING WILL NOT BE INSTALLED.

dltesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado 80525
Phone: 970.530.8868
www.dltescoservices.com

P.E. Seal

Sheet Revisions

No.	Revisions:	By	Date:

SITE AND HORIZONTAL CONTROL PLAN

DESIGNED BY: D. Egger
DRAWN BY: R. Bunner
APPROVED BY: J. Burrell

DATE: February 8, 2023
SCALE: 1" = 40'
FILE NAME: Batch Plant Site.dwg

WELLINGTON BATCH PLANT
CONNELL RESOURCES

CONNELL

PROJECT NUMBER: XXXX

SHEET NUMBER
C204

SHEET INDEX: 7

Drawing Name: D:\Projects\Wellington Batch Plant\Dwg\Sheets\Batch Plant Site.dwg Wednesday, February 08, 2023 5:11 PM By: Rhonda Bunner

Line Table				
LINE	LENGTH	BEARING	BEGIN LINE	END LINE
L1	2.00'	S05°47'56.83"E	N: 1508029.20 E: 3136652.29	N: 1508027.21 E: 3136652.50
L2	43.98'	S84°12'03.17"W	N: 1508016.26 E: 3136643.56	N: 1508011.81 E: 3136599.81
L3	389.34'	S89°50'07.42"W	N: 1508063.25 E: 3137973.04	N: 1508062.13 E: 3137583.69
L4	745.53'	S87°35'49.47"W	N: 1508061.05 E: 3137547.86	N: 1508029.80 E: 3136802.99
L5	42.01'	S84°12'03.17"W	N: 1508023.43 E: 3136714.20	N: 1508019.19 E: 3136672.41
L6	2.00'	N05°47'56.83"W	N: 1508028.12 E: 3136661.45	N: 1508030.11 E: 3136661.25
L7	153.12'	N89°04'35.56"E	N: 1507985.01 E: 3136599.97	N: 1507987.48 E: 3136753.08
L8	26.64'	S00°10'13.68"W	N: 1507959.41 E: 3136780.38	N: 1507932.77 E: 3136780.30
L9	1128.02'	S01°15'21.43"W	N: 1507932.77 E: 3136780.30	N: 1506805.02 E: 3136755.57
L10	107.44'	S00°45'54.23"W	N: 1506805.02 E: 3136755.57	N: 1506697.59 E: 3136754.14
L11	49.91'	N88°19'35.55"E	N: 1506697.59 E: 3136754.14	N: 1506699.04 E: 3136804.02
L12	24.00'	N01°40'24.45"W	N: 1506699.04 E: 3136804.02	N: 1506723.03 E: 3136803.32
L13	61.23'	N00°45'54.23"E	N: 1506743.29 E: 3136782.75	N: 1506804.52 E: 3136783.57
L14	318.56'	N01°15'21.16"E	N: 1506804.52 E: 3136783.57	N: 1507123.01 E: 3136790.55
L15	538.76'	N87°35'49.47"E	N: 1507157.92 E: 3136836.13	N: 1507180.50 E: 3137374.42
L16	96.77'	N66°15'20.74"E	N: 1507186.79 E: 3137401.47	N: 1507225.75 E: 3137490.05
L17	245.25'	N87°35'49.47"E	N: 1507232.04 E: 3137517.11	N: 1507242.32 E: 3137762.15
L18	550.56'	N00°10'13.68"E	N: 1507317.03 E: 3137834.00	N: 1507867.58 E: 3137835.64
L19	398.08'	S87°35'49.47"W	N: 1507942.74 E: 3137757.50	N: 1507926.05 E: 3137359.77
L20	116.15'	S35°27'03.92"W	N: 1507894.62 E: 3137301.82	N: 1507800.00 E: 3137234.45
L21	38.51'	S87°35'49.47"W	N: 1507779.05 E: 3137195.82	N: 1507777.43 E: 3137157.34
L22	200.68'	S87°35'49.47"W	N: 1507777.43 E: 3137157.34	N: 1507769.02 E: 3136956.84
L23	41.54'	S87°35'49.47"W	N: 1507769.02 E: 3136956.84	N: 1507767.28 E: 3136915.34
L24	10.02'	N01°15'21.16"E	N: 1507777.49 E: 3136904.92	N: 1507787.50 E: 3136905.14
L25	115.74'	N87°35'49.47"E	N: 1507797.28 E: 3136914.72	N: 1507802.13 E: 3137030.36
L26	115.00'	N02°24'10.53"W	N: 1507802.13 E: 3137030.36	N: 1507917.03 E: 3137025.53
L27	132.43'	S87°35'49.47"W	N: 1507917.03 E: 3137025.53	N: 1507911.47 E: 3136893.22
L28	126.53'	S01°15'21.16"W	N: 1507901.70 E: 3136883.64	N: 1507775.20 E: 3136880.87
L29	13.47'	S87°35'49.47"W	N: 1507765.43 E: 3136871.29	N: 1507764.86 E: 3136857.82
L30	116.26'	N01°15'32.46"E	N: 1507815.92 E: 3136805.74	N: 1507932.15 E: 3136808.29

Line Table				
LINE	LENGTH	BEARING	BEGIN LINE	END LINE
L31	31.07'	N00°10'13.68"E	N: 1507932.15 E: 3136808.29	N: 1507963.22 E: 3136808.39
L32	714.96'	N87°35'49.47"E	N: 1507991.11 E: 3136835.21	N: 1508021.09 E: 3137549.54
L33	385.59'	N88°03'40.90"E	N: 1508022.14 E: 3137584.43	N: 1508035.18 E: 3137969.80
L34	380.89'	S88°26'04.91"W	N: 1508023.51 E: 3137968.45	N: 1508013.10 E: 3137587.70
L35	712.61'	S87°35'49.47"W	N: 1508011.96 E: 3137546.58	N: 1507982.08 E: 3136834.59
L36	30.76'	S00°10'13.68"W	N: 1507963.15 E: 3136816.39	N: 1507932.40 E: 3136816.30
L37	124.34'	S01°15'21.16"W	N: 1507932.40 E: 3136816.30	N: 1507808.08 E: 3136813.57
L38	530.61'	S85°36'43.11"W	N: 1508153.71 E: 3139305.36	N: 1508113.11 E: 3138776.31
L39	302.34'	S85°41'09.11"W	N: 1508113.11 E: 3138776.31	N: 1508090.37 E: 3138474.83
L40	248.17'	S86°02'38.48"W	N: 1508090.37 E: 3138474.83	N: 1508073.25 E: 3138227.25
L41	150.41'	S86°55'15.83"W	N: 1508073.25 E: 3138227.25	N: 1508065.17 E: 3138077.06
L42	150.92'	N86°55'15.83"E	N: 1508041.19 E: 3138078.02	N: 1508049.29 E: 3138228.72
L43	248.43'	N86°02'38.48"E	N: 1508049.29 E: 3138228.72	N: 1508066.43 E: 3138476.56
L44	302.43'	N85°41'09.11"E	N: 1508066.43 E: 3138476.56	N: 1508089.18 E: 3138778.13
L45	532.26'	N85°36'43.11"E	N: 1508089.18 E: 3138778.13	N: 1508129.91 E: 3139308.83
L46	43.87'	S66°15'20.74"W	N: 1507821.36 E: 3137491.97	N: 1507803.69 E: 3137451.81
L47	15.31'	N82°46'49.74"W	N: 1507801.77 E: 3137438.60	N: 1507803.70 E: 3137423.42
L48	86.15'	S66°15'20.74"W	N: 1507801.78 E: 3137410.21	N: 1507767.09 E: 3137331.35
L49	15.31'	S35°17'31.22"W	N: 1507758.65 E: 3137321.01	N: 1507746.16 E: 3137312.17
L50	43.87'	S66°15'20.74"W	N: 1507737.72 E: 3137301.83	N: 1507720.05 E: 3137261.68
L51	146.27'	N35°27'03.92"E	N: 1507758.06 E: 3137241.41	N: 1507877.21 E: 3137326.25
L52	398.08'	N87°35'49.47"E	N: 1507896.08 E: 3137361.03	N: 1507912.77 E: 3137758.75
L53	243.09'	S87°35'49.47"W	N: 1507837.83 E: 3137761.90	N: 1507827.64 E: 3137519.02
L54	88.62'	S19°10'22.34"E	N: 1507423.72 E: 3137772.14	N: 1507340.01 E: 3137801.25
L55	6.32'	S00°10'13.68"W	N: 1507323.44 E: 3137804.02	N: 1507317.12 E: 3137804.00
L56	292.56'	S87°35'49.47"W	N: 1507272.29 E: 3137760.89	N: 1507260.03 E: 3137468.59
L57	392.83'	N23°44'39.26"W	N: 1507289.85 E: 3137420.73	N: 1507649.43 E: 3137262.55
L58	229.22'	N66°15'20.74"E	N: 1507715.33 E: 3137288.18	N: 1507807.63 E: 3137498.01
L59	207.67'	N87°35'49.47"E	N: 1507812.65 E: 3137519.65	N: 1507821.36 E: 3137727.13
L60	6.32'	S00°10'13.68"W	N: 1507746.20 E: 3137805.28	N: 1507739.88 E: 3137805.26

Line Table				
LINE	LENGTH	BEARING	BEGIN LINE	END LINE
L61	88.62'	S19°30'49.70"W	N: 1507723.33 E: 3137802.39	N: 1507639.80 E: 3137772.78
L62	182.96'	S00°10'13.68"W	N: 1507623.24 E: 3137769.91	N: 1507440.29 E: 3137769.37
L63	0.00'	N00°10'12.41"E	N: 1507440.29 E: 3137769.37	N: 1507440.29 E: 3137769.37
L64	182.96'	N00°10'13.68"E	N: 1507440.24 E: 3137784.37	N: 1507623.20 E: 3137784.91
L65	54.42'	N19°30'49.70"E	N: 1507634.78 E: 3137786.92	N: 1507686.08 E: 3137805.10
L66	308.83'	S00°10'13.68"W	N: 1507686.08 E: 3137805.10	N: 1507377.24 E: 3137804.18
L67	54.42'	N19°10'22.34"W	N: 1507377.24 E: 3137804.18	N: 1507428.64 E: 3137786.31
L68	0.00'	S00°10'12.23"W	N: 1507440.24 E: 3137784.37	N: 1507440.24 E: 3137784.37
L69	481.22'	S23°44'39.26"E	N: 1507719.58 E: 3137187.99	N: 1507279.10 E: 3137381.76
L70	495.34'	S87°35'49.47"W	N: 1507209.01 E: 3137338.09	N: 1507188.24 E: 3136843.18
L71	464.39'	N01°15'21.16"E	N: 1507225.25 E: 3136792.79	N: 1507689.53 E: 3136802.97
L72	32.76'	N87°35'49.47"E	N: 1507724.44 E: 3136848.55	N: 1507725.81 E: 3136881.28
L73	30.61'	S61°26'21.00"E	N: 1507719.77 E: 3136907.29	N: 1507705.14 E: 3136934.17
L74	100.00'	N87°35'49.47"E	N: 1507699.10 E: 3136960.17	N: 1507703.29 E: 3137060.08
L75	30.61'	N56°37'59.95"E	N: 1507711.49 E: 3137085.49	N: 1507728.32 E: 3137111.05
L76	22.84'	N87°35'49.47"E	N: 1507736.52 E: 3137136.48	N: 1507737.48 E: 3137159.27
L77	34.64'	S01°15'21.16"W	N: 1507692.90 E: 3136811.04	N: 1507658.27 E: 3136810.29
L78	418.28'	S01°15'21.16"W	N: 1507656.27 E: 3136810.29	N: 1507240.09 E: 3136801.12
L79	18.57'	S01°15'21.16"W	N: 1507240.09 E: 3136801.12	N: 1507221.53 E: 3136800.71

Point Table			
POINT #	DESCRIPTION	NORTHING	EASTING
101	OFFICE	1507907.2668	3137031.4486
102	OFFICE	1507908.4407	3137059.4239
103	OFFICE	1507823.5155	3137062.9877
104	OFFICE	1507822.3415	3137035.0123
105	EOC	1507613.0541	3136937.1399
106	EOC	1507613.6830	3136952.1267
107	EOC	1507533.7533	3136955.4809
108	EOC	1507533.1244	3136940.4941
109	EOC	1507648.8618	3136955.6549
110	EOC	1507649.9100	3136980.6329
111	EOC	1507498.9937	3136961.9439
112	EOC	1507500.0419	3136986.9219
113	EOC	1507650.5389	3136995.6197
114	EOC	1507652.0063	3137030.5890
115	EOC	1507615.5697	3136997.0872
116	EOC	1507617.0371	3137032.0564

Point Table			
POINT #	DESCRIPTION	NORTHING	EASTING
117	EOC	1507652.6352	3137045.5758
118	EOC	1507655.7797	3137120.5098
119	EOC	1507577.7012	3137048.7203
120	EOC	1507580.8457	3137123.6543
121	SHOP	1507136.7356	3136944.2560
122	SHOP	1507136.6017	3136989.2558
123	SHOP	1507036.7360	3136943.9584
124	SHOP	1507036.6021	3136988.9582
125	LEAN-TO	1507137.1130	3136832.4122
126	LEAN-TO	1507136.9642	3136882.4120
127	LEAN-TO	1506937.1139	3136831.8171
128	LEAN-TO	1506936.9651	3136881.8169
129	GARAGE	1507136.5124	3137019.2556
130	GARAGE	1507136.3934	3137059.2555
131	GARAGE	1507036.5129	3137018.9581
132	GARAGE	1507036.3939	3137058.9579

Curve Table							
CURVE	DELTA	RADIUS	LENGTH	BEARING	CHORD	BEGIN CURVE	END CURVE
C1	90°00'02"	10.00'	15.71'	S39°12'02"W	14.14'	N: 1508027.21 E: 3136652.50	N: 1508016.26 E: 3136643.56
C2	1°21'05"	1520.00'	35.85'	S88°16'22"W	35.85'	N: 1508062.13 E: 3137583.69	N: 1508061.05 E: 3137547.86
C3	3°23'46"	1502.00'	89.03'	S85°53'56"W	89.02'	N: 1508029.80 E: 3136802.99	N: 1508023.43 E: 3136714.20
C4	90°00'00"	10.00'	15.71'	N50°47'57"W	14.14'	N: 1508019.19 E: 3136672.41	N: 1508028.12 E: 3136661.45
C5	88°44'00"	28.00'	43.36'	S44°11'47"E	39.16'	N: 1507987.48 E: 3136753.08	N: 1507959.41 E: 3136780.38
C6	92°24'41"	20.00'	32.26'	N45°26'26"W	28.87'	N: 1506723.03 E: 3136803.32	N: 1506743.29 E: 3136782.75
C7	70°04'52"	50.00'	61.16'	N52°33'24"E	57.42'	N: 1507123.01 E: 3136790.55	N: 1507157.92 E: 3136836.13
C8	21°20'29"	75.00'	27.94'	N76°55'35"E	27.77'	N: 1507180.50 E: 3137374.42	N: 1507186.79 E: 3137401.47
C9	21°20'29"	75.00'	27.94'	N76°55'35"E	27.77'	N: 1507225.75 E: 3137490.05	N: 1507232.04 E: 3137517.11
C10	87°25'36"	75.00'	114.44'	N43°53'02"E	103.66'	N: 1507242.32 E: 3137762.15	N: 1507317.03 E: 3137834.00
C11	92°34'24"	75.00'	121.18'	N46°06'58"W	108.42'	N: 1507867.58 E: 3137835.64	N: 1507942.74 E: 3137757.50
C12	52°08'46"	75.00'	68.26'	S61°31'27"W	65.93'	N: 1507926.05 E: 3137359.77	N: 1507894.62 E: 3137301.82
C13	52°08'46"	50.00'	45.51'	S61°31'27"W	43.95'	N: 1507800.00 E: 3137234.45	N: 1507779.05 E: 3137195.82
C14	93°39'32"	10.00'	16.35'	N45°34'25"W	14.59'	N: 1507767.28 E: 3136915.34	N: 1507777.49 E: 3136904.92
C15	86°20'28"	10.00'	15.07'	N44°25'35"E	13.68'	N: 1507787.50 E: 3136905.14	N: 1507797.28 E: 3136914.72
C16	86°20'28"	10.00'	15.07'	S44°25'35"W	13.68'	N: 1507911.47 E: 3136883.22	N: 1507901.70 E: 3136883.64
C17	86°20'28"	10.00'	15.07'	S44°25'35"W	13.68'	N: 1507775.20 E: 3136880.87	N: 1507765.43 E: 3136871.29
C18	93°39'43"	50.00'	81.74'	N45°34'19"W	72.93'	N: 1507764.86 E: 3136857.82	N: 1507815.92 E: 3136805.74

Curve Table							
CURVE	DELTA	RADIUS	LENGTH	BEARING	CHORD	BEGIN CURVE	END CURVE
C19	87°25'36"	28.00'	42.72'	N43°53'02"E	38.70'	N: 1507963.22 E: 3136808.39	N: 1507991.11 E: 3136835.21
C20	1°21'05"	1480.00'	34.91'	N88°16'22"E	34.90'	N: 1508021.09 E: 3137549.54	N: 1508022.14 E: 3137584.43
C21	1°36'41"	1463.00'	41.14'	S88°24'10"W	41.14'	N: 1508013.10 E: 3137587.70	N: 1508011.96 E: 3137546.58
C22	87°25'36"	19.00'	28.99'	S43°53'02"W	26.26'	N: 1507982.08 E: 3136834.59	N: 1507963.15 E: 3136816.39
C23	30°57'50"	25.00'	13.51'	S81°44'16"W	13.35'	N: 1507803.69 E: 3137451.81	N: 1507801.77 E: 3137438.60
C24	30°57'50"	25.00'	13.51'	S81°44'16"W	13.35'	N: 1507803.70 E: 3137423.42	N: 1507801.78 E: 3137410.21
C25	30°57'50"	25.00'	13.51'	S50°46'26"W	13.35'	N: 1507767.09 E: 3137331.35	N: 1507758.65 E: 3137321.01
C26	30°57'50"	25.00'	13.51'	S50°46'26"W	13.35'	N: 1507746.16 E: 3137312.17	N: 1507737.72 E: 3137301.83
C27	131°48'37"	20.00'	46.01'	N47°50'21"W	36.51'	N: 1507720.05 E: 3137261.68	N: 1507744.56 E: 3137234.61
C28	17°23'06"	50.00'	15.17'	N26°45'31"E	15.11'	N: 1507744.56 E: 3137234.61	N: 1507758.06 E: 3137241.41
C29	52°08'46"	45.00'	40.96'	N61°31'27"E	39.56'	N: 1507877.21 E: 3137326.25	N: 1507896.08 E: 3137361.03
C30	180°00'00"	37.50'	117.81'	S02°24'11"E	75.00'	N: 1507912.77 E: 3137758.75	N: 1507837.83 E: 3137761.90
C31	21°20'29"	75.00'	27.94'	S76°55'35"W	27.77'	N: 1507827.64 E: 3137519.02	N: 1507821.36 E: 3137491.97
C32	19°20'36"	50.00'	16.88'	S09°30'04"E	16.80'	N: 1507440.29 E: 3137769.37	N: 1507423.72 E: 3137772.14
C33	19°20'36"	50.00'	16.88'	S09°30'04"E	16.80'	N: 1507340.01 E: 3137801.25	N: 1507323.44 E: 3137804.02
C34	87°25'36"	45.00'	68.66'	S43°53'02"W	62.19'	N: 1507317.12 E: 3137804.00	N: 1507272.29 E: 3137760.89
C35	68°39'31"	50.00'	59.92'	N58°04'25"W	56.39'	N: 1507260.03 E: 3137468.59	N: 1507289.85 E: 3137420.73
C36	90°00'00"	50.00'	78.54'	N21°15'21"E	70.71'	N: 1507649.43 E: 3137262.55	N: 1507715.33 E: 3137288.18

Curve Table							
CURVE	DELTA	RADIUS	LENGTH	BEARING	CHORD	BEGIN CURVE	END CURVE
C37	21°20'29"	60.00'	22.35'	N76°55'35"E	22.22'	N: 1507807.63 E: 3137498.01	N: 1507812.65 E: 3137519.65
C38	92°34'24"	75.00'	121.18'	S46°06'58"E	108.42'	N: 1507821.36 E: 3137727.13	N: 1507746.20 E: 3137805.28
C39	19°20'36"	50.00'	16.88'	S09°50'32"W	16.80'	N: 1507739.88 E: 3137805.26	N: 1507723.33 E: 3137802.39
C40	19°20'36"	50.00'	16.88'	S09°50'32"W	16.80'	N: 1507639.80 E: 3137772.78	N: 1507623.24 E: 3137769.91
C41	19°20'36"	35.00'	11.82'	N09°50'32"E	11.76'	N: 1507623.20 E: 3137784.91	N: 1507634.78 E: 3137786.92
C42	19°20'36"	35.00'	11.82'	N09°30'04"W	11.76'	N: 1507428.64 E: 3137786.31	N: 1507440.24 E: 3137784.37
C43	111°20'29"	50.00'	97.16'	S31°55'35"W	82.58'	N: 1507279.10 E: 3137381.76	N: 1507209.01 E: 3137338.09
C44	77°23'55"	50.00'	67.54'	N53°42'13"W	62.52'	N: 1507188.24 E: 3136843.18	N: 1507225.25 E: 3136792.79
C45	70°04'52"	50.00'	61.16'	N52°33'24"E	57.42'	N: 1507689.53 E: 3136802.97	N: 1507724.44 E: 3136848.55
C46	30°57'50"	50.00'	27.02'	S76°55'16"E	26.69'	N: 1507725.81 E: 3136881.28	N: 1507719.77 E: 3136907.29
C47	30°57'50"	50.00'	27.02'	S76°55'16"E	26.69'	N: 1507705.14 E: 3136934.17	N: 1507699.10 E: 3136960.17
C48	30°57'50"	50.00'	27.02'	N72°06'55"E	26.69'	N: 1507703.29 E: 3137060.08	N: 1507711.49 E: 3137085.49
C49	30°57'50"	50.00'	27.02'	N72°06'55"E	26.69'	N: 1507728.32 E: 3137111.05	N: 1507736.52 E: 3137136.46
C50	68°39'31"	30.00'	35.95'	S58°04'25"E	33.84'	N: 1507737.48 E: 3137159.27	N: 1507719.58 E: 3137187.99

dltesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado 80525
Phone: 970.226.0883
www.dltescoservices.com

P.E. Seal

Sheet Revisions

No.	Revisions:	By:	Date:

LINE & CURVE DATA AND POINT TABLE

DESIGNED BY:	D. Egger	DATE:	February 8, 2023
DRAWN BY:	R. Bunner	SCALE:	NTS
APPROVED BY:	J. Burnell	FILE NAME:	Batch Plant Site.dwg

WELLINGTON BATCH PLANT
CONNELL RESOURCES

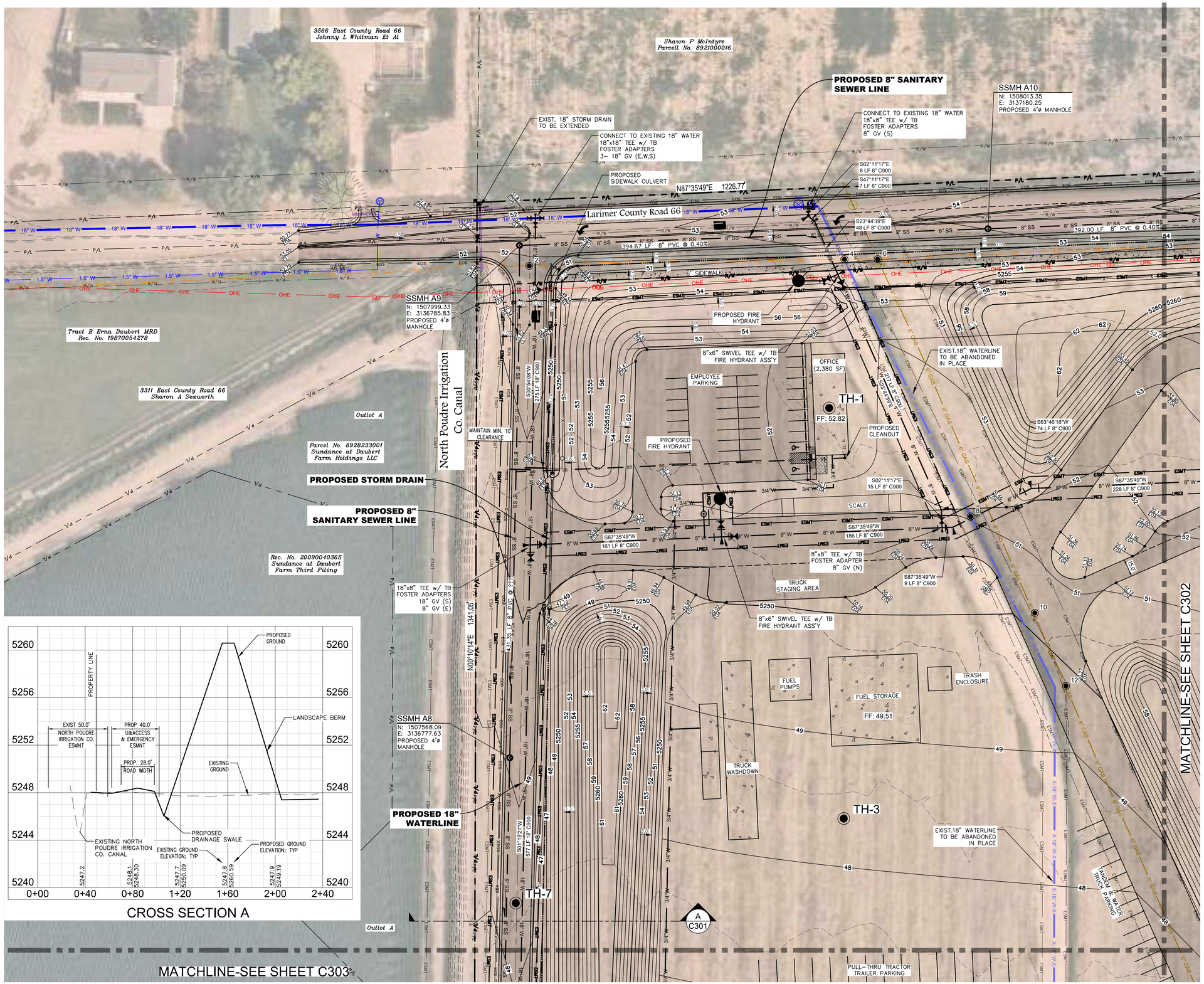
CONNELL

PROJECT NUMBER:
XXXX

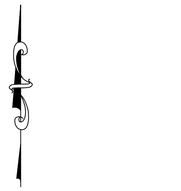
SHEET NUMBER
C205

SHEET INDEX: 8

Drawing Name: D:\Projects\Wellington Batch Plant\Dwg\Sheets\Batch Plant Site.dwg Wednesday, February 08, 2023 5:11 PM By: Rhonda Bunner



CROSS SECTION A



SCALE: 1" =40'
(True scale for 22x34 sheet size)

LEGEND:

EXISTING CONTOURS	4987
PROPOSED CONTOURS	4987
SITE PROPERTY LINE	P/L
EXISTING RIGHT OF WAY	R/W
PROPOSED RIGHT OF WAY	R/W
PROPOSED EDGE OF ASPHALT	
PROPOSED EDGE OF SHOULDER	EOS
EDGE OF GRAVEL ROAD	
PROPOSED SWALE	
PROPOSED CHAIN LINK FENCE	
PROPOSED 2-STRAND BARB-WIRE	X
EXISTING EASEMENT	ESMT
PROPOSED EASEMENT	ESMT
EXISTING WATER	18" W
PROPOSED WATER	8" W
PROPOSED 3/4" WATER SERVICE	3/4"W
EXISTING SANITARY SEWER	8" SS
PROPOSED SANITARY SEWER	8" SS
EXISTING STORM DRAIN	
PROPOSED STORM DRAIN	
EXISTING OVERHEAD ELECTRIC	OHE
EXISTING SINCLAIR GASOLINE PIPELINE	6" GAS
EXISTING FIBER OPTIC	FO
EXISTING GATE VALVE	W
EXISTING WATER MANHOLE	W
EXISTING SANITARY SEWER MANHOLE	S
PROPOSED SANITARY SEWER MANHOLE	S
PROPOSED FIRE HYDRANT	
PROPOSED GATE VALVE	
PROPOSED THRUST BLOCK	
EXISTING POWER POLE	
EXISTING ELECTRIC BOX	
EXISTING TELEPHONE PEDESTAL	T
EXISTING MAILBOX	M
PLANT ACCESS ROAD (ASPHALT)	
GRAVEL ROAD	
BORE HOLES	TH2
UTILITY POTHOLE	20

NOTES:

1. THE SIZE, TYPE AND LOCATION OF ALL KNOWN UNDERGROUND UTILITIES ARE APPROXIMATE WHEN SHOWN ON THESE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE OF ALL UNDERGROUND UTILITIES IN THE AREA OF THE WORK.
2. ALL SYMBOLS ARE ONLY GRAPHICALLY REPRESENTED AND ARE NOT TO SCALE.

dltesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado 80525
Phone: 970.530.8661
www.dltescoservices.com

P.E. Seal

Sheet Revisions

No.	Revisions:	By	Date:

UTILITY AND GRADING PLAN

DESIGNED BY:	D. Egger
DRAWN BY:	R. Bunner
APPROVED BY:	J. Burrell
DATE:	February 8, 2023
SCALE:	1" = 40'
FILE NAME:	Batch Plant Site Grading.dwg

WELLINGTON BATCH PLANT
CONNELL RESOURCES

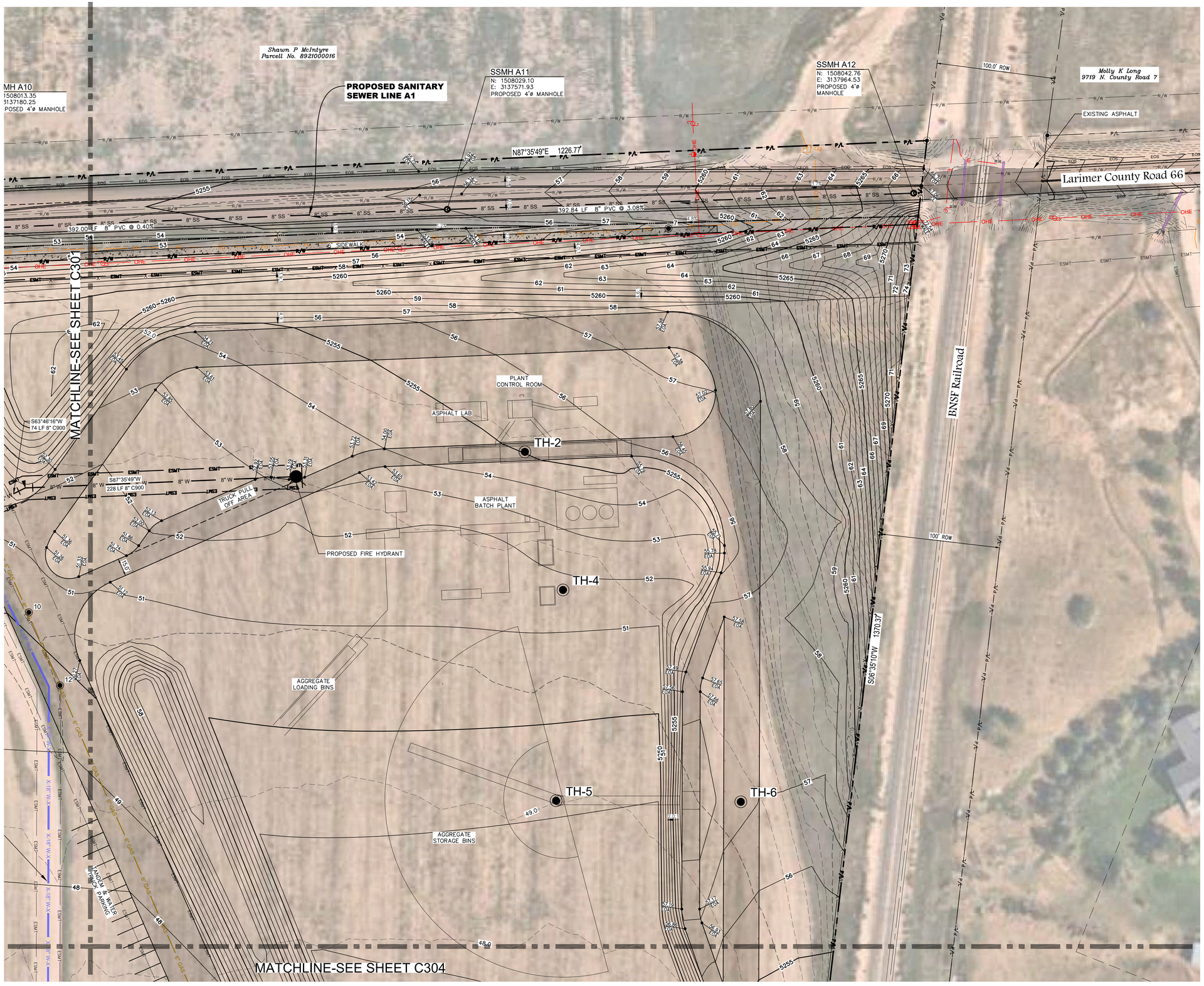
CONNELL

PROJECT NUMBER:
XXXX

SHEET NUMBER
C301

SHEET INDEX: 9

Drawing Name: D:\Projects\Wellington Batch Plant\Dwg\Sheets\Batch Plant Site Grading.dwg Wednesday, February 08, 2023 5:08 PM By: Rhonda Bunner



40' 0 40' 80' 120'

SCALE: 1" =40'
(True scale for 22x34 sheet size)

LEGEND:

- EXISTING CONTOURS — 4987
- PROPOSED CONTOURS — 4987
- SITE PROPERTY LINE — P/L
- EXISTING RIGHT OF WAY — R/W
- PROPOSED RIGHT OF WAY — R/W
- PROPOSED EDGE OF ASPHALT
- PROPOSED EDGE OF SHOULDER — EOS
- EDGE OF GRAVEL ROAD
- PROPOSED SWALE
- PROPOSED CHAIN LINK FENCE
- PROPOSED 2-STRAND BARB-WIRE — X
- EXISTING EASEMENT — ESMT
- PROPOSED EASEMENT — ESMT
- EXISTING WATER — 18" W
- PROPOSED WATER — 8" W
- PROPOSED 3/4" WATER SERVICE — 3/4"W
- EXISTING SANITARY SEWER — 8" SS
- PROPOSED SANITARY SEWER — 8" SS
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- EXISTING OVERHEAD ELECTRIC — OHE
- EXISTING SINCLAIR GASOLINE PIPELINE — 6" GAS
- EXISTING FIBER OPTIC — FO
- EXISTING GATE VALVE
- EXISTING WATER MANHOLE
- EXISTING SANITARY SEWER MANHOLE
- PROPOSED SANITARY SEWER MANHOLE
- PROPOSED FIRE HYDRANT
- PROPOSED GATE VALVE
- PROPOSED THRUST BLOCK
- EXISTING POWER POLE
- EXISTING ELECTRIC BOX
- EXISTING TELEPHONE PEDESTAL
- EXISTING MAILBOX
- PLANT ACCESS ROAD (ASPHALT)
- GRAVEL ROAD
- BORE HOLES — TH2
- UTILITY POTHOLE — 20

NOTES:

1. THE SIZE, TYPE AND LOCATION OF ALL KNOWN UNDERGROUND UTILITIES ARE APPROXIMATE WHEN SHOWN ON THESE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE OF ALL UNDERGROUND UTILITIES IN THE AREA OF THE WORK.
2. ALL SYMBOLS ARE ONLY GRAPHICALLY REPRESENTED AND ARE NOT TO SCALE.

TAG NOTES:

(A) PARKING STALLS SHOWN FOR LAYOUT PURPOSES ONLY. STRIPING WILL NOT BE INSTALLED.

dltesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado 80525
Phone: 970.530.8863
www.dltescoservices.com

P.E. Seal

Sheet Revisions

No.	Revisions:	By	Date:

UTILITY AND GRADING PLAN

DESIGNED BY:	D. Egger	DATE:	February 8, 2023
DRAWN BY:	R. Bunner	SCALE:	1" = 40'
APPROVED BY:	J. Burrell	FILE NAME:	Batch Plant Site Grading.dwg

WELLINGTON BATCH PLANT
CONNELL RESOURCES

CONNELL

PROJECT NUMBER: XXXX

SHEET NUMBER
C302

SHEET INDEX: 10

Drawing Name: D:\Projects\Wellington Batch Plant\Dwg\Sheets\Batch Plant Site Grading.dwg Wednesday, February 08, 2023 5:08 PM By: Rhonda Bunner

40' 0 40' 80' 120'

SCALE: 1" =40'
(True scale for 22x34 sheet size)

LEGEND:

EXISTING CONTOURS	4987
PROPOSED CONTOURS	4987
SITE PROPERTY LINE	P/L
EXISTING RIGHT OF WAY	R/W
PROPOSED RIGHT OF WAY	R/W
PROPOSED EDGE OF ASPHALT	
PROPOSED EDGE OF SHOULDER	EOS
EDGE OF GRAVEL ROAD	
PROPOSED SWALE	
PROPOSED CHAIN LINK FENCE	
PROPOSED 2-STRAND BARB-WIRE	X
EXISTING EASEMENT	ESMT
PROPOSED EASEMENT	ESMT
EXISTING WATER	18" W
PROPOSED WATER	8" W
PROPOSED 3/4" WATER SERVICE	3/4"W
EXISTING SANITARY SEWER	8" SS
PROPOSED SANITARY SEWER	8" SS
EXISTING STORM DRAIN	
PROPOSED STORM DRAIN	
EXISTING OVERHEAD ELECTRIC	OHE
EXISTING SINCLAIR GASOLINE PIPELINE	6" GAS
EXISTING FIBER OPTIC	FO
EXISTING GATE VALVE	
EXISTING WATER MANHOLE	
EXISTING SANITARY SEWER MANHOLE	
PROPOSED SANITARY SEWER MANHOLE	
PROPOSED FIRE HYDRANT	
PROPOSED GATE VALVE	
PROPOSED THRUST BLOCK	
EXISTING POWER POLE	
EXISTING ELECTRIC BOX	
EXISTING TELEPHONE PEDESTAL	T
EXISTING MAILBOX	M
PLANT ACCESS ROAD (ASPHALT)	
GRAVEL ROAD	
BORE HOLES	TH2
UTILITY POTHOLE	20

NOTES:

1. THE SIZE, TYPE AND LOCATION OF ALL KNOWN UNDERGROUND UTILITIES ARE APPROXIMATE WHEN SHOWN ON THESE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE OF ALL UNDERGROUND UTILITIES IN THE AREA OF THE WORK.
2. ALL SYMBOLS ARE ONLY GRAPHICALLY REPRESENTED AND ARE NOT TO SCALE.

ditesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado 80525
Phone: 970.530.8060
www.ditescoservices.com

P.E. Seal

Sheet Revisions

No.	Revisions:	By	Date:

UTILITY AND GRADING PLAN

DESIGNED BY:	D. Egger	DATE:	February 8, 2023
DRAWN BY:	R. Bunner	SCALE:	1" = 40'
APPROVED BY:	J. Burrell	FILE NAME:	Batch Plant Site Grading.dwg

WELLINGTON BATCH PLANT
CONNELL RESOURCES

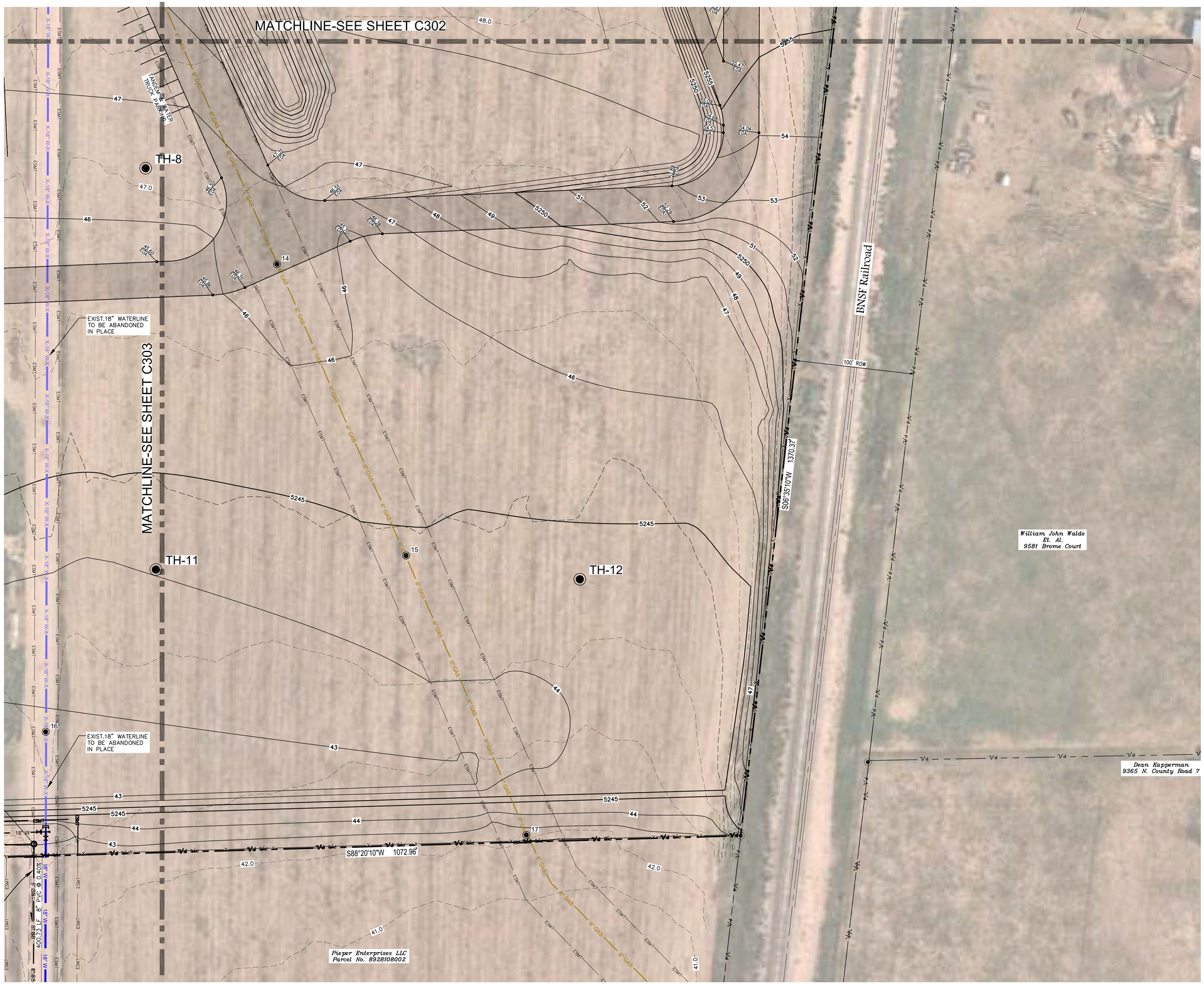
CONNELL

PROJECT NUMBER: XXXX

SHEET NUMBER
C303

SHEET INDEX: 11

Drawing Name: D:\Projects\Wellington Batch Plant\Dwg\Sheets\Batch Plant Site Grading.dwg Wednesday, February 08, 2023 5:08 PM By: Rhonda Bunner



40' 0 40' 80' 120'

SCALE: 1" =40'
(True scale for 22x34 sheet size)

LEGEND:

EXISTING CONTOURS	4987
PROPOSED CONTOURS	4987
SITE PROPERTY LINE	P/L
EXISTING RIGHT OF WAY	R/W
PROPOSED RIGHT OF WAY	R/W
PROPOSED EDGE OF ASPHALT	
PROPOSED EDGE OF SHOULDER	EOS
EDGE OF GRAVEL ROAD	
PROPOSED SWALE	
PROPOSED CHAIN LINK FENCE	
PROPOSED 2-STRAND BARB-WIRE	X
EXISTING EASEMENT	ESMT
PROPOSED EASEMENT	ESMT
EXISTING WATER	18" W
PROPOSED WATER	8" W
PROPOSED 3/4" WATER SERVICE	3/4"W
EXISTING SANITARY SEWER	8" SS
PROPOSED SANITARY SEWER	8" SS
EXISTING STORM DRAIN	
PROPOSED STORM DRAIN	
EXISTING OVERHEAD ELECTRIC	OHE
EXISTING SINCLAIR GASOLINE PIPELINE	6" GAS
EXISTING FIBER OPTIC	FO
EXISTING GATE VALVE	
EXISTING WATER MANHOLE	
EXISTING SANITARY SEWER MANHOLE	
PROPOSED SANITARY SEWER MANHOLE	
PROPOSED FIRE HYDRANT	
PROPOSED GATE VALVE	
PROPOSED THRUST BLOCK	
EXISTING POWER POLE	
EXISTING ELECTRIC BOX	
EXISTING TELEPHONE PEDESTAL	T
EXISTING MAILBOX	M
PLANT ACCESS ROAD (ASPHALT)	
GRAVEL ROAD	
BORE HOLES	TH2
UTILITY POTHOLE	20

NOTES:

1. THE SIZE, TYPE AND LOCATION OF ALL KNOWN UNDERGROUND UTILITIES ARE APPROXIMATE WHEN SHOWN ON THESE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE OF ALL UNDERGROUND UTILITIES IN THE AREA OF THE WORK.
2. ALL SYMBOLS ARE ONLY GRAPHICALLY REPRESENTED AND ARE NOT TO SCALE.

dltesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado 80525
Phone 970.226.0860
www.dltescoservices.com

P.E. Seal

Sheet Revisions

No.	Revisions:	By	Date:

UTILITY AND GRADING PLAN

DESIGNED BY:	D. Egger
DRAWN BY:	R. Bunner
APPROVED BY:	J. Burrell
DATE:	February 8, 2023
SCALE:	1" = 40'
FILE NAME:	Batch Plant Site Grading.dwg

WELLINGTON BATCH PLANT
CONNELL RESOURCES

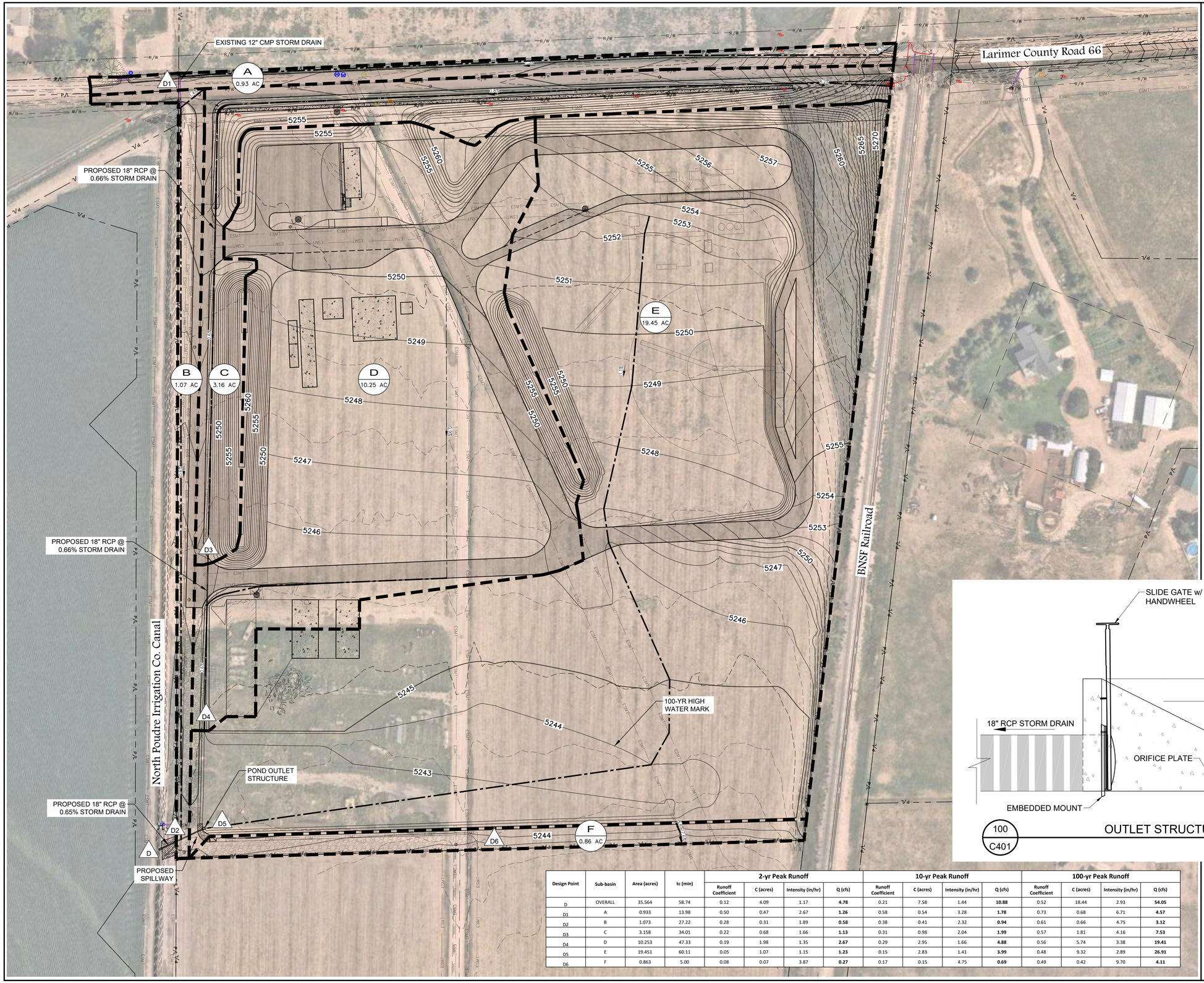
CONNELL

PROJECT NUMBER: XXXX

SHEET NUMBER
C304

SHEET INDEX: 12

Drawing Name: D:\Projects\Wellington Batch Plant\Dwg\Sheets\Batch Plant Site Grading.dwg Wednesday, February 08, 2023 5:08 PM By: Rhonda Bunner



Design Point	Sub-basin	Area (acres)	tc (min)	2-yr Peak Runoff				10-yr Peak Runoff				100-yr Peak Runoff			
				Runoff Coefficient	C (acres)	Intensity (in/hr)	Q (cfs)	Runoff Coefficient	C (acres)	Intensity (in/hr)	Q (cfs)	Runoff Coefficient	C (acres)	Intensity (in/hr)	Q (cfs)
D	OVERALL	35.564	58.74	0.12	4.09	1.17	**4.78**	0.21	7.58	1.44	**10.88**	0.52	18.44	2.93	**54.05**
D1	A	0.933	13.98	0.50	0.47	2.67	**1.26**	0.58	0.54	3.28	**1.78**	0.73	0.68	6.71	**4.57**
D2	B	1.073	27.22	0.28	0.31	1.89	**0.58**	0.38	0.41	2.32	**0.94**	0.61	0.66	4.75	**3.12**
D3	C	3.158	34.01	0.22	0.68	1.66	**1.13**	0.31	0.98	2.04	**1.99**	0.57	1.81	4.16	**7.53**
D4	D	10.253	47.33	0.19	1.98	1.35	**2.67**	0.29	2.95	1.66	**4.88**	0.56	5.74	3.38	**19.41**
D5	E	19.451	60.11	0.05	1.07	1.15	**1.23**	0.15	2.83	1.41	**3.99**	0.48	9.32	2.89	**26.91**
D6	F	0.863	5.00	0.08	0.07	3.87	**0.27**	0.17	0.15	4.75	**0.69**	0.49	0.42	9.70	**4.11**

80' 0 80' 160' 240'

SCALE: 1" = 80'
(True scale for 22x34 sheet size)

LEGEND:

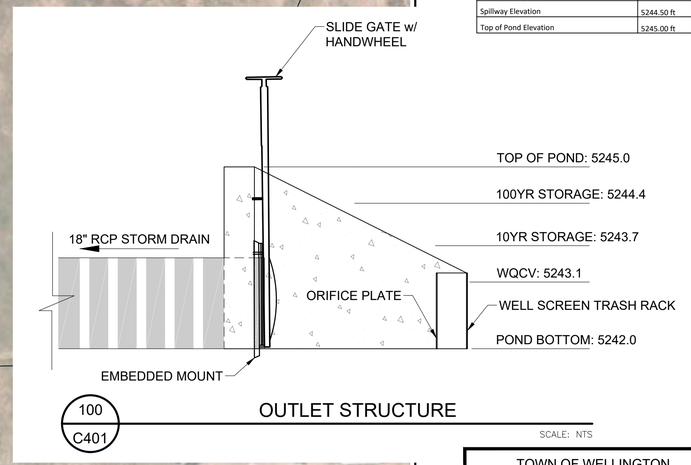
- PROPOSED CONTOUR — 28
- EXISTING CONTOUR — 5028
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- DRAINAGE BASIN LABEL — BASIN DESIGNATION: A; BASIN AREA (AC): 1.23 ac
- DRAINAGE DESIGN POINT — 9B
- DRAINAGE BASIN BOUNDARY
- FLOW PATH

NOTES:

FOR DRAINAGE REVIEW ONLY NOT FOR CONSTRUCTION

1. REFER TO THE "CONNELL BATCH PLANT DRAINAGE REPORT" BY DITESCO, DATED NOVEMEBER 11, 2022 FOR ADDITIONAL INFORMATION.
2. REFER TO SITE PLAN AND GRADING AND UTILITY PLANS FOR ADDITIONAL INFORMATION.

Pond Summary Table	
Pond Bottom Elevation	5244.00 ft
Water Quality Capture Volume (WQCV)	0.34 ac-ft
WQCV Elevation	5243.10 ft
100-Year Storage Volume	2.23 ac-ft
100-Year Elevation	5244.40 ft
Spillway Elevation	5244.50 ft
Top of Pond Elevation	5245.00 ft



100 / C401 OUTLET STRUCTURE

SCALE: NTS

TOWN OF WELLINGTON DRAWING APPROVAL

REVIEW IS FOR GENERAL COMPLIANCE WITH TOWN STANDARDS. NO RESPONSIBILITY IS ASSUMED FOR CORRECTNESS OF DESIGN.

DATE_____BY _____ TOWN ENGINEER

DATE_____BY _____ PUBLIC WORKS DIRECTOR

ditesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado 80525
Phone: 970.226.0861
www.ditescoservices.com

P.E. Seal

Sheet Revisions

No.	Revisions:	By	Date:

DEVELOPED DRAINAGE EXHIBIT

DESIGNED BY: D. Egger
DRAWN BY: R. Bunner
APPROVED BY: J. Burrell
DATE: February 8, 2023
SCALE: 1" = 80'
FILE NAME: Batch Plant Drainage Site.dwg

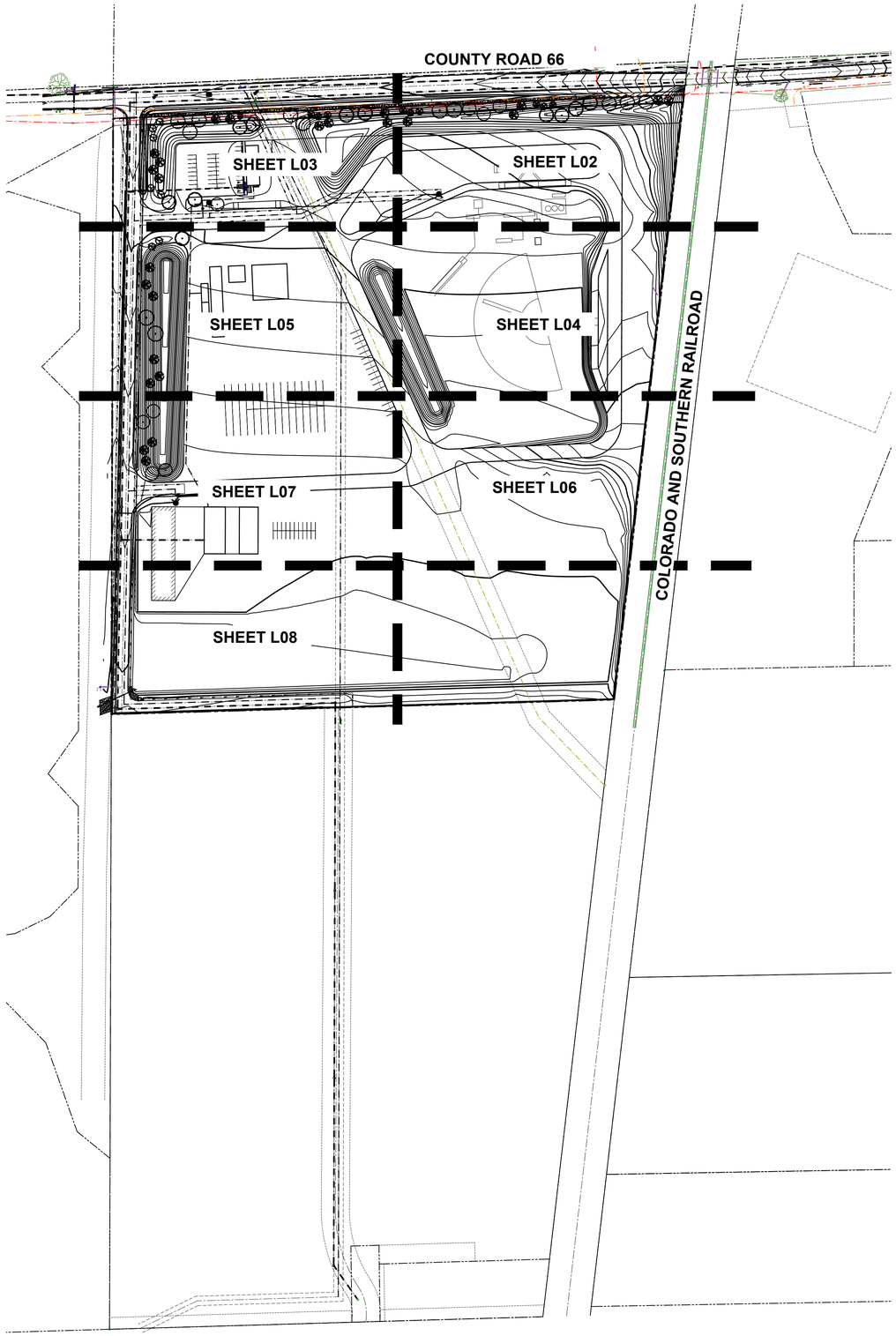
WELLINGTON BATCH PLANT
CONNELL RESOURCES

PROJECT NUMBER: XXXX

SHEET NUMBER
C401

SHEET INDEX: 13

Drawing Name: D:\Projects\Wellington Batch Plant\Dwg\Sheets\Batch Plant Drainage Site.dwg Wednesday, February 08, 2023 5:07 PM By: Rhonda Bunner



GENERAL LANDSCAPE NOTES

1. PLANT QUALITY: ALL PLANT MATERIAL SHALL BE A-GRADE OR NO. 1 GRADE - FREE OF ANY DEFECTS, OF NORMAL HEALTH, HEIGHT, LEAF DENSITY AND SPREAD APPROPRIATE TO THE SPECIES AS DEFINED BY THE AMERICAN ASSOCIATION OF NURSERYMEN (AAN) STANDARDS. ALL TREES SHALL BE BALL AND BURLAP OR EQUIVALENT.
2. IRRIGATION: ALL LANDSCAPE AREAS WITHIN THE SITE INCLUDING TURF, SHRUB BEDS AND TREE AREAS SHALL BE IRRIGATED WITH AN AUTOMATIC IRRIGATION SYSTEM. THE IRRIGATION PLAN MUST BE REVIEWED AND APPROVED BY THE TOWN OF WELLINGTON WATER UTILITIES DEPARTMENT PRIOR TO THE ISSUANCE OF A BUILDING PERMIT. ALL TURF AREAS SHALL BE IRRIGATED WITH AN AUTOMATIC POP-UP IRRIGATION SYSTEM. ALL SHRUB BEDS AND TREES, INCLUDING IN NATIVE SEED AREAS, SHALL BE IRRIGATED WITH AN AUTOMATIC DRIP (TRICKLE) IRRIGATION SYSTEM, OR WITH AN ACCEPTABLE ALTERNATIVE APPROVED BY THE CITY WITH THE IRRIGATION PLANS. THE IRRIGATION SYSTEM SHALL BE ADJUSTED TO MEET THE WATER REQUIREMENTS OF THE INDIVIDUAL PLANT MATERIAL.
3. TOPSOIL: TO THE MAXIMUM EXTENT FEASIBLE, TOPSOIL THAT IS REMOVED DURING CONSTRUCTION ACTIVITY SHALL BE CONSERVED FOR LATER USE ON AREAS REQUIRING REVEGETATION AND LANDSCAPING.
4. SOIL AMENDMENTS: THE SOIL IN ALL LANDSCAPE AREAS, INCLUDING PARKWAYS AND MEDIANS, SHALL BE THOROUGHLY LOOSENED TO A DEPTH OF NOT LESS THAN EIGHT(8) INCHES AND SOIL AMENDMENT SHALL BE THOROUGHLY INCORPORATED INTO THE SOIL OF ALL LANDSCAPE AREAS TO A DEPTH OF AT LEAST SIX(6) INCHES BY TILLING, DISCING OR OTHER SUITABLE METHOD, AT A RATE OF AT LEAST FOUR (4) CUBIC YARDS OF SOIL AMENDMENT PER ONE THOUSAND (1,000) SQUARE FEET OF LANDSCAPE AREA. NATIVE GRASS SEED MIXES CAN REDUCE THE COMPOST RATE TO TWO (2) CUBIC YARDS OF SOIL AMENDMENT PER ONE THOUSAND (1,000) SQUARE FEET.
5. INSTALLATION AND GUARANTEE: ALL LANDSCAPING SHALL BE INSTALLED ACCORDING TO SOUND HORTICULTURAL PRACTICES IN A MANNER DESIGNED TO ENCOURAGE QUICK ESTABLISHMENT AND HEALTHY GROWTH. ALL LANDSCAPING FOR EACH PHASE MUST BE EITHER INSTALLED OR THE INSTALLATION MUST BE SECURED WITH AN IRREVOCABLE LETTER OF CREDIT, PERFORMANCE BOND, OR ESCROW ACCOUNT FOR 125% OF THE VALUATION OF THE MATERIALS AND LABOR PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY FOR ANY BUILDING IN SUCH PHASE.
6. MAINTENANCE: TREES AND VEGETATION, IRRIGATION SYSTEMS, FENCES, WALLS AND OTHER LANDSCAPE ELEMENTS WITH THESE FINAL PLANS SHALL BE CONSIDERED AS ELEMENTS OF THE PROJECT IN THE SAME MANNER AS PARKING, BUILDING MATERIALS AND OTHER SITE DETAILS. THE APPLICANT, LANDOWNER OR SUCCESSORS IN INTEREST SHALL BE JOINTLY AND SEVERALLY RESPONSIBLE FOR THE REGULAR MAINTENANCE OF ALL LANDSCAPING ELEMENTS IN GOOD CONDITION. ALL LANDSCAPING SHALL BE MAINTAINED FREE FROM DISEASE, PESTS, WEEDS AND LITTER, AND ALL LANDSCAPE STRUCTURES SUCH AS FENCES AND WALLS SHALL BE REPAIRED AND REPLACED PERIODICALLY TO MAINTAIN A STRUCTURALLY SOUND CONDITION.
7. REPLACEMENT: ANY LANDSCAPE ELEMENT THAT DIES, OR IS OTHERWISE REMOVED, SHALL BE PROMPTLY REPLACED IN ACCORDANCE WITH THE REQUIREMENTS OF THESE PLANS.
8. THE FOLLOWING SEPARATIONS SHALL BE PROVIDED BETWEEN TREES/SHRUBS AND UTILITIES:

   40 FEET BETWEEN CANOPY TREES AND STREET LIGHTS
   15 FEET BETWEEN ORNAMENTAL TREES AND STREETLIGHTS
   10 FEET BETWEEN TREES AND PUBLIC WATER, SANITARY AND STORM SEWER MAIN LINES
   10 FEET BETWEEN SHRUBS AND PUBLIC WATER AND SANITARY AND STORM SEWER LINES
   6 FEET BETWEEN TREES AND GAS LINES
9. ALL STREET TREES SHALL BE PLACED A MINIMUM EIGHT (8) FEET AWAY FROM THE EDGES OF DRIVEWAYS AND ALLEYS
10. PLACEMENT OF ALL LANDSCAPING SHALL BE IN ACCORDANCE WITH THE SIGHT DISTANCE CRITERIA AS SPECIFIED BY THE TOWN OF WELLINGTON. NO STRUCTURES OR LANDSCAPE ELEMENTS GREATER THAN 24" SHALL BE ALLOWED WITHIN THE SIGHT DISTANCE TRIANGLE OR EASEMENTS WITH THE EXCEPTION OF DECIDUOUS TREES PROVIDED THAT THE LOWEST BRANCH IS AT LEAST 8' FROM GRADE. ANY FENCES WITHIN THE SIGHT DISTANCE TRIANGLE OR EASEMENT MUST BE NOT MORE THAN 42" IN HEIGHT AND OF AN OPEN DESIGN.
11. THE FINAL LANDSCAPE PLAN SHALL BE COORDINATED WITH ALL OTHER FINAL PLAN ELEMENTS SO THAT THE PROPOSED GRADING, STORM DRAINAGE, AND OTHER DEVELOPMENT IMPROVEMENTS DO NOT CONFLICT WITH NOR PRECLUDE INSTALLATION AND MAINTENANCE OF LANDSCAPE ELEMENTS ON THIS PLAN.
12. MINOR CHANGES IN SPECIES AND PLANT LOCATIONS MAY BE MADE DURING CONSTRUCTION -- AS REQUIRED BY SITE CONDITIONS OR PLANT AVAILABILITY. OVERALL QUANTITY, QUALITY, AND DESIGN CONCEPT MUST BE CONSISTENT WITH THE APPROVED PLANS. IN THE EVENT OF CONFLICT WITH THE QUANTITIES INCLUDED IN THE PLANT LIST, SPECIES AND QUANTITIES ILLUSTRATED SHALL BE PROVIDED. ALL CHANGES OF PLANT SPECIES AND LOCATION MUST HAVE WRITTEN APPROVAL BY THE CITY PRIOR TO INSTALLATION.
13. ALL PLANTING BEDS SHALL BE MULCHED TO A MINIMUM DEPTH OF THREE INCHES.
14. EDGING BETWEEN GRASS AND SHRUB BEDS SHALL BE 18" X 4" STEEL SET LEVEL WITH TOP OF SOD OR APPROVED EQUAL.
15. ONE YEAR WARRANTY TO BE PROVIDED ON ALL PLANT MATERIAL BY THE LANDSCAPE CONTRACTOR.
16. MULCH SHALL BE COMPRISED OF A ROCK MULCH MIX:
    40% WASHED PEA GRAVEL
    60% 3/4-1.5" DIA. WASHED WESTERN RIVER ROCK
17. DRIP IRRIGATION OF PLANT MATERIAL SHALL BE INCLUDED IN THE DRYLAND SEEDED AREAS PER THE APPROVED IRRIGATION PLANS.

NATIVE SEED MIX NOTES

1. PREPARE SOIL AS NECESSARY AND APPROPRIATE FOR NATIVE SEED MIX SPECIES THROUGH AERATION AND ADDITION OF AMENDMENTS, THEN SEED IN TWO DIRECTIONS TO DISTRIBUTE SEED EVENLY OVER ENTIRE AREA.
2. IF CHANGES ARE TO BE MADE TO SEED MIX BASED ON SITE CONDITIONS THEN APPROVAL MUST BE PROVIDED BY CITY ENVIRONMENTAL PLANNER.
3. APPROPRIATE NATIVE SEEDING EQUIPMENT WILL BE USED (STANDARD TURF SEEDING EQUIPMENT OR AGRICULTURE EQUIPMENT SHALL NOT BE USED).
4. DRILL SEED APPLICATION RECOMMENDED PER SPECIFIED APPLICATION RATE TO NO MORE THAN ½ INCH DEPTH. FOR BROADCAST SEEDING INSTEAD OF DRILL SEEDING METHOD DOUBLE SPECIFIED APPLICATION RATE. REFER TO NATIVE SEED MIX TABLE FOR SPECIES, PERCENTAGES AND APPLICATION RATES.
5. TREAT NATIVE SEED MIX AREA PRIOR TO INSTALLATION OF SEED WITH APPROPRIATE HERBICIDE TO PROACTIVELY MITIGATE HERBACEOUS WEED SPECIES GROWTH DURING ESTABLISHMENT PERIOD THEN AFTER APPROPRIATE TIME PERIOD APPLY NATIVE SEED AS CALLED FOR ON APPROVED PLANS.
6. AFTER SEEDING THE AREA SHALL BE COVERED WITH CRIMPED STRAW OR OTHER APPROPRIATE METHODS AND PROVIDED TEMPORARY IRRIGATION UNTIL SEED IS ESTABLISHED.
7. CONTRACTOR SHALL MONITOR SEEDED AREA FOR PROPER IRRIGATION, EROSION CONTROL, GERMINATION AND RESEEDING AS NEEDED TO ESTABLISH COVER.
8. THE APPROVED SEED MIX AREA IS INTENDED TO BE MAINTAINED IN A NATURAL LIKE LANDSCAPE AESTHETIC. IF AND WHEN MOWING OCCURS IN NATIVE GRASS SEED MIX AREAS DO NOT MOW LOWER THAN 6-8 INCHES IN HEIGHT TO AVOID INHIBITING NATIVE PLANT GROWTH.
9. NATIVE SEED AREA WILL BE CONSIDERED ESTABLISHED WHEN SEVENTY PERCENT TOTAL COVER IS REACHED WITH NO LARGER THAN ONE FOOT SQUARE BARE SPOTS AND/OR UNTIL DEEMED ESTABLISHED BY CITY PLANNING SERVICES.
10. THE DRYLAND GRASSES SHALL BE IRRIGATED WITH A WATER TRUCK ONCE EVERY THREE DAYS DURING THE FIRST MONTH TO AID IN ESTABLISHMENT, AND ONCE A WEEK THEREAFTER FOR THE FIRST GROWING SEASON. DURING THE SECOND GROWING SEASON, THE DRYLAND GRASSES SHALL BE WATERED WITH THE SAME METHOD EVERY OTHER WEEK DURING THE GROWING SEASON. AFTER THE FIRST TWO GROWING SEASONS, WATERING WILL BE ON AN AS NEEDED BASIS.

PLANT LIST

Code	Scientific Name	Common Name	Qty.	Size	Diversity	Water Use	Comments
DECIDUOUS SHADE TREES			**29**				
CASP	Catalpa speciosa	Western Catalpa	8	2" cal	13.1%	Low	
CEOC	Celtis occidentalis	Western Hackberry	8	2" cal	13.1%	Xeric	
GLTS	Gleditsia triacanthos interims 'Skyline'	Skyline Honeylocust	9	2" cal	14.8%	Low	
GYDI	Gymnocladus diocia 'Espresso'	Espresso Kentucky Coffetree	4	2" cal	6.6%	Low	Seedless Clone
ORNAMENTAL TREES			**7**				
CVWG	Crataegus viridis 'Winter King'	Wintergreen Hawthorne Hawthorne	7	1.5" cal	11.5%	Low	
EVERGREEN TREES			**25**				
PIPG	Picea pungens glauca	Colorado Blue Spruce	12	6' B&B	19.7%	Med	
PINI	Pinus nigra	Austrian Pine	13	6' B&B	21.3%	Low	
TOTAL TREES			**61**				
DECIDUOUS SHRUBS			**31**				
ERNN	Ericameria nauseosa ssp. nauseosa var. speciosa	Tall Blue Rabbitbrush	26	#5		Xeric	
RHTR	Rhus trilobata	Three Leaf Sumac	5	#5		Low	
EVERGREEN SHRUBS			**40**				
JUCH	Juniperus chinensis 'Holbert'	Holbert Juniper	21	#5		Xeric	
JUHH	Juniperus horizontalis 'Hughes'	Hughes Juniper	14	#5		Xeric	
JUTT	Juniperus scopulorum 'Table Top'	Table Top Blue Juniper	5	#5		Xeric	
ORNAMENTAL GRASSES			**37**				
PAVS	Panicum virgatum 'Shenandoah'	Shenandoah Switchgrass	37	#1		Low	

SEED MIXES

DRYLAND NATIVE GRASS SEED MIX

Scientific Name	Common Name	Percent of Mix	Seeded Rate Lbs/ Acre (drilled)
Schizachyrium scoparium 'Cimarron'	**Little Bluestem**	**5.0%**	**0.50**
Pasopyrum smithii 'Arriba'	**Western Wheatgrass**	**23.0%**	**5.46**
Bouteloua gracilis 'Hachita'	**Blue Grama**	**25.0%**	**0.79**
Sporobolus airoides	**Alkali sacaton**	**9.0%**	**0.13**
Achnatherum hymenoides	**Indian Ricegrass**	**5.0%**	**0.93**
Elymus Trachycaulus 'Prior'	**Slender Wheatgrass**	**15.0%**	**2.47**
Artemisia millefolium	**Prairie Sage***	**1.0%**	**0.01**
Nassila Viridula 'Lodorm'	**Green Needle Grass**	**15.0%**	**2.17**
Achillea millefolium	**White Yarrow***	**0.1%**	**0.001**
Sphaeralcea coccinea	**Scarlet Globemallow**	**0.9%**	**0.05**
Ratibida columnifera	**Prairie Coneflower**	**1.0%**	**0.04**
		100%	**12.54**

***Package seed separately**
Seeding rate: 60 seeds per square foot, drilled

WATER USE

Water Usage Category	Total Area Per Category	Gallons per sf	Total Gallons of Water per Square foot of Category
High Water Use	0	12	0
Medium Water Use	0	9	0
Low Water Use (shrub beds)	5,997	3	17,991
Xeric (very low) Water Use (dryland turf)	263,087	1	263,087
Totals	269,084		281,078

LANDSCAPE USE CATEGORIES

Category	Area/ length			
Total Site Area	1,463,725			
Landscape Area	269,084			
Percent of Site	18.38%			
			Trees Required	Trees Provided
County Road 66	1,160	1 tree/ 40 Linear Foot	29	29
Site Perimeter	1,235	1 tree/ 40 Linear Foot	30.875	38
On Site Landscaping	3,100	1 tree/ 1000 sf	3.1	4
Total Trees Provided			59.875	71
Notes				
1) Due to the drainage swale along CR 66, street trees were placed behind the walk, but in front of the fence.				

VIGNETTE studios
Planning • Landscape Architecture • Graphics
PO Box 1889
FORT COLLINS, COLORADO
80522-1889
970.472.9125 T
970.494.0728 F
www.vignettestudios.com

NORTH

SCALE-1 SCALE-2 SCALE-3 SCALE-4
SCALE

ditesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado 80525
970.226.5686 Fax 970.226.5687
www.ditescoservices.com

P.E. Seal

SHEET STATUS

90% PLAN SET
NOT FOR CONSTRUCTION

COVER SHEET

DESIGNED BY: TCH
DRAWN BY: TCH
APPROVED BY: TCH
DATE: February 7, 2023
SCALE: NTS
FILE NAME: 25034-L.dwg

WELLINGTON BATCH PLANT
CONNELL RESOURCES

CONNELL

PROJECT NUMBER: 25034
SHEET NUMBER
L01
SHEET INDEX: 14

Drawing Name: \\Mac\Dropbox\Vignette 2\25034 Connell\Drawings\PDP1\25034L1.dwg Tuesday, February 07, 2023 12:40 PM By: Terenceahoglund Bunner

COUNTY ROAD 66

ROADSIDE DITCH
OVERHEAD POWER LINE
6' WALK

COLORADO AND SOUTHERN RAILROAD

(1) PINI
(3) PICE
(2) GYDI
(3) CEOC
(2) PINI
(3) PICE
(2) GLTS
(2) QUMA
(3) CASP
(2) PINI

MATCHLINE SHEET L03

MATCHLINE SHEET L04

LANDSCAPE PLAN LEGEND

- PRAIRIE SEED MIX
- ROCK MULCH
- SHADE TREES
- ORNAMENTAL TREES
- EVERGREEN TREES
- DECIDUOUS SHRUBS
- ORNAMENTAL GRASSES
- EVERGREEN SHRUBS

NORTH

0 10 20 40
SCALE 1"=20'

VIGNETTE studios
Planning • Landscape Architecture • Graphics
PO Box 1889
FORT COLLINS, COLORADO
80522-1889
970.472.9125 T
970.494.0728 F
www.vignettestudios.com

ditesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado, 80525
970.221.5956 Fax 970.221.5955
www.ditescoservices.com

P.E. Seal

SHEET STATUS
90% PLAN SET
NOT FOR CONSTRUCTION

LANDSCAPE PLAN NORTHEAST

DESIGNED BY:	TCH	DATE: 02/07/2023
DRAWN BY:	TCH	SCALE: NTS
APPROVED BY:	TCH	FILE NAME: 25034_L.dwg

WELLINGTON BATCH PLANT
CONNELL RESOURCES

CONNELL

PROJECT NUMBER: 25034
SHEET NUMBER L02
SHEET INDEX: 15

Drawing Name: \\Mac\Dropbox\VIgnette 2\25034 Connell\Drawings\PDF\25034L1.dwg Tuesday, February 07, 2023 12:40 PM By: Terencehoglund Bunner

COUNTY ROAD 66

NORTH POUDRE IRRIGATION COMPANY CANAL

ACCESS ROAD

OFFICE

ROADSIDE DITCH
OVERHEAD POWER LINE
6' WALK
50' SINCLAIR EASEMENT
20' UTILITY EASEMENT

(3) CVWG
(3) CASP
(2) PINI
(2) GLTS
(4) PIPG
(2) CVWG
(1) GLTS
(3) JUHH
(6) ERNN
(7) JUCH
(21) PAVS
(6) ERNN
(1) GLTS
(5) RHTR
(3) ERNN
(3) JUCH
(1) CEOC
(11) JUHH
(16) PAVS
(2) QUMA
(3) PICE
(2) PIPG
(2) CASP
(2) PINI

MATCHLINE SHEET L05

MATCHLINE SHEET L02

SCALE

LANDSCAPE PLAN LEGEND

- PRAIRIE SEED MIX
- ROCK MULCH
- SHADE TREES
- ORNAMENTAL TREES
- EVERGREEN TREES
- DECIDUOUS SHRUBS
- ORNAMENTAL GRASSES
- EVERGREEN SHRUBS

NORTH

0 10 20 40
SCALE 1"=20'

VIGNETTE studios
Planning • Landscape Architecture • Graphics
PO Box 1889
FORT COLLINS, COLORADO
80522-1889
970.472.9125 T
970.494.0728 F
www.vignettestudios.com

ditesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado, 80525
Phone: 970.672.8660
www.ditescoservices.com

P.E. Seal

SHEET STATUS
90% PLAN SET
NOT FOR CONSTRUCTION

LANDSCAPE PLAN NORTHWEST

DESIGNED BY:	TCH	DATE:
DRAWN BY:	TCH	SCALE: NTS
APPROVED BY:	TCH	FILE NAME: 25034L.dwg

WELLINGTON BATCH PLANT
CONNELL RESOURCES

CONNELL

PROJECT NUMBER: 25034

SHEET NUMBER
L03

SHEET INDEX: 16

Drawing Name: \\Mac\Dropbox\Vignette 2\25034 Connell\Drawings\PDF\25034L1.dwg Tuesday, February 07, 2023 12:40 PM By: Terencehoaglund Bunner

MATCHLINE SHEET L02

MATCHLINE SHEET L05

MATCHLINE SHEET L06

COLORADO AND SOUTHERN RAILROAD

LANDSCAPE PLAN LEGEND

- PRAIRIE SEED MIX
- ROCK MULCH
- SHADE TREES
- ORNAMENTAL TREES
- EVERGREEN TREES
- DECIDUOUS SHRUBS
- ORNAMENTAL GRASSES
- EVERGREEN SHRUBS

NORTH

0 10 20 40
SCALE 1"=20'

VIGNETTE studios
Planning • Landscape Architecture • Graphics
PO Box 1889
FORT COLLINS, COLORADO
80522-1889
970.472.9125 T
970.494.0728 F
www.vignettestudios.com

ditesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado 80525
970.221.6868 phone 970.221.6869 fax
www.ditescoservices.com

P.E. Seal

SHEET STATUS

90% PLAN SET
NOT FOR
CONSTRUCTION

LANDSCAPE PLAN MIDDLE EAST

DESIGNED BY:	TCH	DATE: 2/7/2023
DRAWN BY:	TCH	SCALE: NTS
APPROVED BY:	TCH	FILE NAME: 25034LI.dwg

WELLINGTON BATCH PLANT
CONNELL RESOURCES

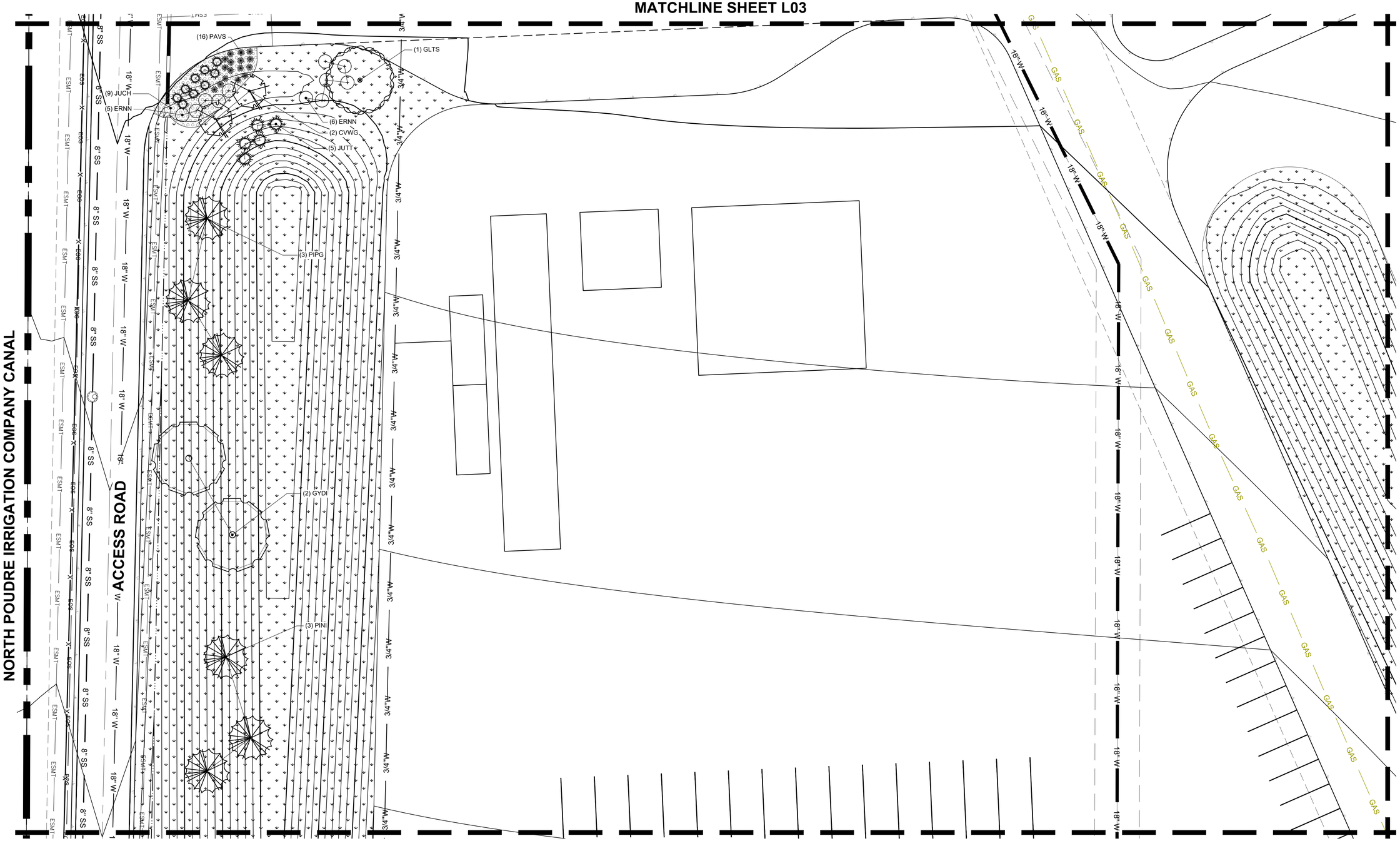
CONNELL

PROJECT NUMBER: 25034

SHEET NUMBER
L04

SHEET INDEX: 17

Drawing Name: \\Mac\Dropbox\Vignette 2\25034 Connell\Drawings\PDP1\25034LI.dwg Tuesday, February 07, 2023 12:40 PM By: Terenceheaglund Bunner



LANDSCAPE PLAN LEGEND

- PRAIRIE SEED MIX
- ROCK MULCH
- SHADE TREES
- ORNAMENTAL TREES
- EVERGREEN TREES
- DECIDUOUS SHRUBS
- ORNAMENTAL GRASSES
- EVERGREEN SHRUBS

NORTH

0 10 20 40
SCALE 1"=20'

VIGNETTE studios
Planning • Landscape Architecture • Graphics
PO Box 1889
FORT COLLINS, COLORADO
80522-1889
970.472.9125 T
970.494.0728 F
www.vignettestudios.com

ditesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado, 80525
Phone: 970.622.0600
www.ditescoservices.com

P.E. Seal

SHEET STATUS
90% PLAN SET
NOT FOR CONSTRUCTION

LANDSCAPE PLAN MIDDLE

DESIGNED BY:	TCH	DATE:
DRAWN BY:	TCH	SCALE: NTS
APPROVED BY:	TCH	FILE NAME: 25034L.dwg

WELLINGTON BATCH PLANT
CONNELL RESOURCES

CONNELL

PROJECT NUMBER: 25034

SHEET NUMBER
L05

SHEET INDEX: 18

Drawing Name: \\Mac\Dropbox\VIgnette 2\25034 Connell\Drawings\PDF\125034L1.dwg Tuesday, February 07, 2023 12:40 PM By: Terencehoagland Bunner

MATCHLINE SHEET L04

MATCHLINE SHEET L07

GAS

COLORADO AND SOUTHERN RAILROAD

LANDSCAPE PLAN LEGEND

- PRAIRIE SEED MIX
- ROCK MULCH
- SHADE TREES
- ORNAMENTAL TREES
- EVERGREEN TREES
- DECIDUOUS SHRUBS
- ORNAMENTAL GRASSES
- EVERGREEN SHRUBS

NORTH

0 10 20 40
SCALE 1"=20'

VIGNETTE studios
Planning • Landscape Architecture • Graphics
PO Box 1889
FORT COLLINS, COLORADO
80522-1889
970.472.9125 T
970.494.0728 F
www.vignettestudios.com

ditesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado 80525
Phone: 970.632.5868
www.ditescoservices.com

P.E. Seal

SHEET STATUS
90% PLAN SET
NOT FOR CONSTRUCTION

LANDSCAPE PLAN SOUTH EAST

DESIGNED BY:	TCH	DATE: Tuesday, February 07, 2023
DRAWN BY:	TCH	SCALE: NTS
APPROVED BY:	TCH	FILE NAME: 25034_L06.dwg

WELLINGTON BATCH PLANT
CONNELL RESOURCES

CONNELL

PROJECT NUMBER: 25034

SHEET NUMBER
L06

SHEET INDEX: 19

Drawing Name: \\Mac\Dropbox\Vignette 2\25034 Connell\Drawings\PDP\125034L1.dwg Tuesday, February 07, 2023 12:40 PM By: Terenceheaglund Bunner

MATCHLINE SHEET L07

NORTH POUDRE IRRIGATION COMPANY CANAL

ACCESS ROAD

(2) CEOC

(3) PINI

(2) CEOC

MATCHLINE SHEET L06

MATCHLINE SHEET L08

LANDSCAPE PLAN LEGEND

- PRAIRIE SEED MIX
- ROCK MULCH
- SHADE TREES
- ORNAMENTAL TREES
- EVERGREEN TREES
- DECIDUOUS SHRUBS
- ORNAMENTAL GRASSES
- EVERGREEN SHRUBS

NORTH

0 10 20 40

SCALE 1"=20'

VIGNETTE studios

Planning • Landscape Architecture • Graphics

PO Box 1889
FORT COLLINS, COLORADO
80522-1889

970.472.9125 T
970.494.0728 F
www.vignettestudios.com

ditesco
Project & Construction Services

2133 S. Timberline Road, Suite 110
Fort Collins, Colorado, 80525
Phone: 970.672.5600
www.ditescoservices.com

P.E. Seal

SHEET STATUS

90% PLAN SET
NOT FOR
CONSTRUCTION

LANDSCAPE PLAN SOUTHWEST

DESIGNED BY:	TCH
DRAWN BY:	TCH
APPROVED BY:	TCH
DATE:	FEBRUARY 7, 2023
SCALE:	NTS
FILE NAME:	25034_L.dwg

WELLINGTON BATCH PLANT
CONNELL RESOURCES

CONNELL

PROJECT NUMBER: 25034

SHEET NUMBER
L07

SHEET INDEX: 20

Drawing Name: \\Mac\Dropbox\Vignette 2\25034 Connell\Drawings\PDP1\25034L1.dwg Tuesday, February 07, 2023 12:40 PM By: Terancehoaglund Bunner

MATCHLINE SHEET L07

LEAN 2

NORTH POUDRE IRRIGATION COMPANY CANAL

LANDSCAPE PLAN LEGEND

- PRAIRIE SEED MIX
- ROCK MULCH
- SHADE TREES
- ORNAMENTAL TREES
- EVERGREEN TREES
- DECIDUOUS SHRUBS
- ORNAMENTAL GRASSES
- EVERGREEN SHRUBS

NORTH

0 10 20 40
SCALE 1"=20'

VIGNETTE studios
Planning • Landscape Architecture • Graphics
PO Box 1889
FORT COLLINS, COLORADO
80522-1889
970.472.9125 T
970.494.0728 F
www.vignettestudios.com

ditesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado, 80525
Phone: 970.632.5068
www.ditescoservices.com

P.E. Seal

SHEET STATUS
90% PLAN SET
NOT FOR CONSTRUCTION

LANDSCAPE PLAN SOUTH

DESIGNED BY:	TCH	DATE: February 17, 2023
DRAWN BY:	TCH	SCALE: NTS
APPROVED BY:	TCH	FILE NAME: 25034L.dwg

WELLINGTON BATCH PLANT
CONNELL RESOURCES

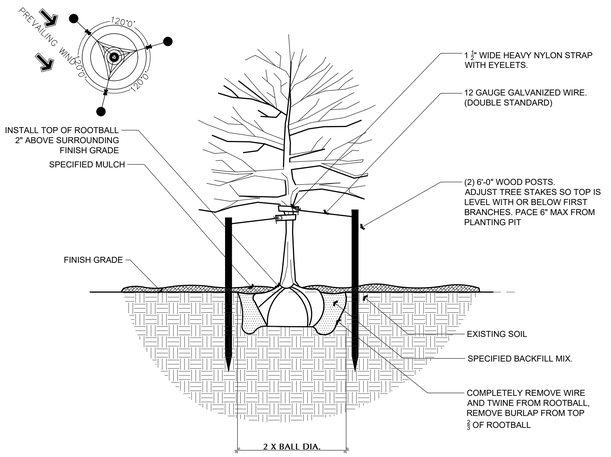
CONNELL

PROJECT NUMBER: 25034

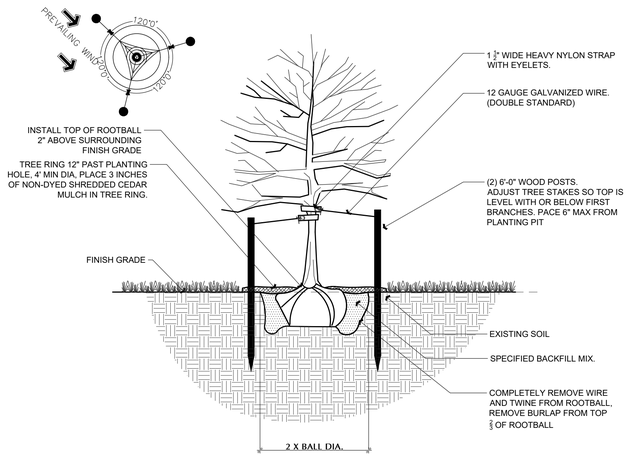
SHEET NUMBER
L08

SHEET INDEX: 21

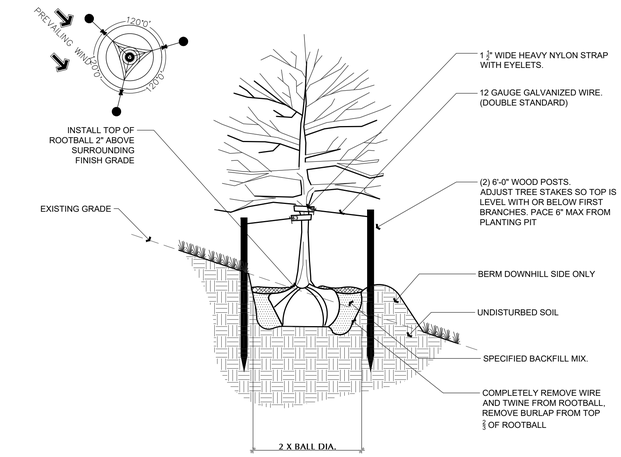
Drawing Name: \\Mac\Dropbox\VIgnette 2\25034 Connell\Drawings\PDP1\25034L1.dwg Tuesday, February 07, 2023 12:40 PM By: Terencehoagland Bunner



1 DECIDUOUS TREE PLANTING DETAIL/ SHRUB BED
NOT TO SCALE



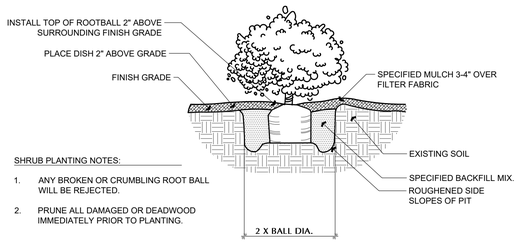
2 DECIDUOUS TREE PLANTING DETAIL/ TURF
NOT TO SCALE



DECIDUOUS TREE PLANTING NOTES

1. DO NOT CUT OR DAMAGE LEADER. PRUNE DAMAGED OR DEAD WOOD IMMEDIATELY PRIOR TO PLANTING. NEVER LEAVE "V" CROTCHES OR DOUBLE LEADER UNLESS TYPICAL OF SPECIES.
2. CUT TWINE AND BURLAP FROM AROUND TRUNK, PULL BACK. REMOVE ALL BURLAP AND WIRE BASKETS BEFORE PLACING IN TREE PIT.
3. ANY BROKEN OR CRUMBLING ROOT BALL WILL BE REJECTED. REMOVING THE WIRE WILL NOT BE AN EXCUSE FROM DAMAGED ROOT BALLS.
4. STAKE TREE LEAVING ENOUGH SLACK SO TREE CAN SWAY IN WIND.
5. USE 2 STAKES FOR TREES 2 1/2" CAL. AND SMALLER. USE 3 STAKES FOR TREES LAGER THAN 2 1/2" CAL. REMOVE ALL STAKES 1 YEAR AFTER PLANTING.
6. FOR WINTERIZATION WRAP ENTIRE SURFACE OF TRUNK TO SECOND BRANCH WITH TREE WRAPPING. SECURE AT 2' INTERVALS WITH VINYL ELECTRICAL TAPE. (REMOVE IN SUMMER)

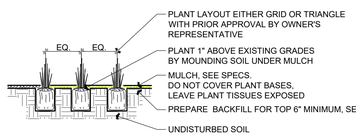
3 TREE PLANTING DETAIL/ SLOPE
NOT TO SCALE



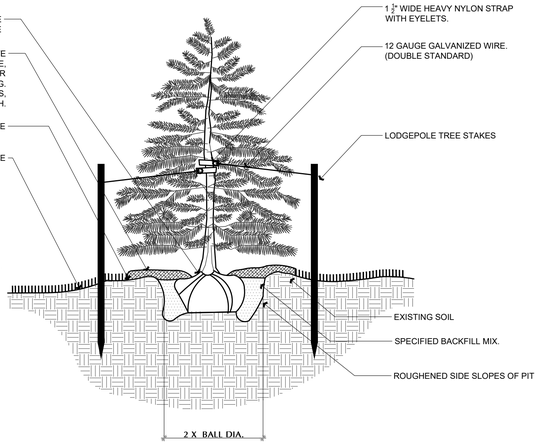
SHRUB PLANTING NOTES:

1. ANY BROKEN OR CRUMBLING ROOT BALL WILL BE REJECTED.
2. PRUNE ALL DAMAGED OR DEADWOOD IMMEDIATELY PRIOR TO PLANTING.

4 SHRUB PLANTING DETAIL
NOT TO SCALE



5 PERENNIAL/ ORN GRASS PLANTING DETAIL
NOT TO SCALE



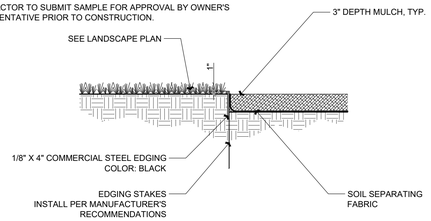
CONIFEROUS TREE PLANTING NOTES

1. DO NOT CUT OR DAMAGE LEADER. PRUNE DAMAGED OR DEAD WOOD IMMEDIATELY PRIOR TO PLANTING.
2. CUT TWINE AND BURLAP FROM AROUND TRUNK, PULL BACK. REMOVE ALL BURLAP AND WIRE BASKETS BEFORE PLACING IN TREE PIT.
3. ANY BROKEN OR CRUMBLING ROOT BALL WILL BE REJECTED. REMOVING THE WIRE WILL NOT BE AN EXCUSE FROM DAMAGED ROOT BALLS.
4. STAKE TREE LEAVING ENOUGH SLACK SO TREE CAN DANCE.
5. USE 2 STAKES FOR TREES 8' AND SMALLER. USE 3 OR MORE STAKES FOR TREES LARGER THAN 8'.
6. REMOVE ALL STAKES 1 YEAR AFTER PLANTING.

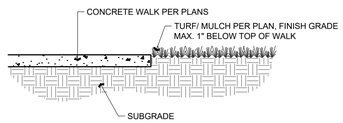
6 CONIFEROUS TREE PLANTING DETAIL
NOT TO SCALE

STEEL EDGING NOTES

1. FINISHED GRADE FOR SOD TO BE 1/2" BELOW TOP OF EDGING.
2. TAMPER MULCH AT EDGING SO THAT IT DOES NOT SPILL INTO TURF.
3. CONTRACTOR TO SUBMIT SAMPLE FOR APPROVAL BY OWNER'S REPRESENTATIVE PRIOR TO CONSTRUCTION.



7 EDGING DETAIL
NOT TO SCALE

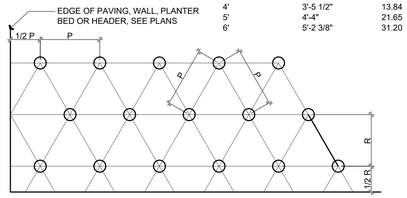


8 WALK/ PLANTING DETAIL
NOT TO SCALE

NOTE:

THIS DETAIL ILLUSTRATES TRIANGULAR SPACING FOR PERENNIALS, SHRUBS AND ORNAMENTAL GRASSES, WHERE APPLICABLE.

P TRIANGULAR	R ROW	AREA PER PLANT SQUARE FEET
6"	5 1/4"	.22
8"	7"	.385
10"	8 3/4"	.60
12"	10 3/8"	.87
18"	1'-3 5/8"	1.95
24"	1'-8 3/4"	3.46
3'	2'-7"	7.80
4'	3'-5 1/2"	13.84
5'	4'-4"	21.65
6'	5'-2 3/8"	31.20



9 SPACING PLANTING DETAIL
NOT TO SCALE

dtesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado, 80525
Phone: 970.672.3600
www.dtescoservices.com

P.E. Seal

SHEET STATUS

90% PLAN SET NOT FOR CONSTRUCTION

LANDSCAPE DETAILS

DESIGNED BY: TCH
DRAWN BY: TCH
APPROVED BY: TCH
DATE: February 07, 2023
SCALE: NTS
FILE NAME: 25034L1.dwg

WELLINGTON BATCH PLANT
CONNELL RESOURCES

CONNELL

VIGNETTE studios
Planning • Landscape Architecture • Graphics
PO Box 1889
FORT COLLINS, COLORADO
80522-1889
970.472.9125 T
970.494.0728 F
www.vignettestudios.com

PROJECT NUMBER: 25034

SHEET NUMBER
L09

SHEET INDEX: 22

Drawing Name: \\Mac\Dropbox\Vignette 2\25034 Connell\Drawings\PDP1\25034L1.dwg Tuesday, February 07, 2023 12:40 PM By: Terencehoaglund Bunner

IRRIGATION_SCHEDULE

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	RAIN BIRD XCZ-100-PRB-COM WIDE FLOW DRIP CONTROL KIT FOR COMMERCIAL APPLICATIONS. 1" BALL VALVE WITH 1" PESB VALVE AND 1" PRESSURE REGULATING 40PSI QUICK-CHECK BASKET FILTER. 0.3 GPM-20 GPM
	DRIP FLUSH VALVE 3/4" PVC BALL VALVE

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	QUICK COUPLER VALVE ASSEMBLY HUNTER HQ-5RC; VALVE WITH YELLOW RUBBER COVER, RED BRASS AND STAINLESS STEEL, WITH 1" NPT INLET, 1-PIECE BODY.
	ISOLATION GATE VALVE ASSEMBLY MATCO-NORCA 514TX. 1/2"-4" BRASS GATE VALVE, FULL PORT, WITH SOLID WEDGE. IPS. CROSS HANDLE. SAME SIZE AS MAINLINE PIPE.
	MASTER VALVE ASSEMBLY BUCKNER-SUPERIOR 3100, NORMALLY OPEN BRASS MASTER VALVE THAT PROVIDES DIRTY WATER PROTECTION. SIZE TO MATCH POC
	REDUCED PRESSURE BACKFLOW PREVENTER WILKINS 375B; BACKFLOW PREVENTER WITH BLOW OUT/FLUSH FITTING. REINFORCED NYLON HOUSING AND CAST BRONZE BALL VALVES. SIZED TO MATCH TAP & METER (RE: POC NOTE).
A	PEDESTAL MOUNT CONTROLLER HUNTER A2C-1200-PP: 12-STATION CONTROLLER IN AN OUTDOOR PLASTIC PEDESTAL. INSTALL WITH WIRELESS RAIN SENSOR AND SOLAR SYNC UNIT.
F	CREATIVE SENSOR TECHNOLOGY FSI-T 1" PVC TEE TYPE FLOW SENSOR W/SOCKET ENDS, CUSTOM MOUNTING TEE AND ULTRA-LIGHTWEIGHT IMPELLER ENHANCES LOW FLOW MEASUREMENT. 2 WIRE DIGITAL OUTPUT. FLOW RANGE: .86-52 GPM.
	PLANTING BED DRIP IRRIGATION LATERAL LINE: 3/4-INCH BLANK UV RADIATION RESISTANT POLYETHYLENE PIPE TO SINGLE OUTLET EMITTERS PER ADJACENT EMITTER CHART.
	NATIVE PLANTING DRIP IRRIGATION LATERAL LINE: 3/4-INCH BLANK UV RADIATION RESISTANT POLYETHYLENE PIPE TO TREE RINGS, NETAFIM INLINE DRIP TUBING MODEL TLCV6-18, AND SINGLE OUTLET EMITTERS FOR SHRUBS PER ADJACENT EMITTER CHART
	IRRIGATION MAINLINE: PVC CLASS 200 SDR 21 1.25-INCH UNLESS OTHERWISE NOTED.
	PIPE SLEEVE: PVC SCHEDULE 40 TYPICAL PIPE SLEEVE FOR IRRIGATION PIPE. REFER TO SPECIFCATIONS.

Valve Callout

INSTALLATION GENERAL NOTES

1. DESIGN ASSUMES A MINIMUM DYNAMIC PRESSURE AVAILABLE FOR THE IRRIGATION SYSTEM (PROVIDED BY ENGINEER) OF 40 PSI- 50 PSI, AT A MAXIMUM PEAK FLOW OF 10 GPM AT THE 3/4-INCH POINT-OF-CONNECTION (POC). VERIFY PRESSURE AND FLOW ON SITE PRIOR TO CONSTRUCTION. CONTACT GENERAL CONTRACTOR OR OWNER'S REPRESENTATIVE IMMEDIATELY IF FLOW OR PRESSURE ARE LOWER THAN LISTED ABOVE.
   1.1. IRRIGATION IS CONNECTED DOWNSTREAM OF THE 3/4-INCH DOMESTIC METER AS INDICATED. IRRIGATION IS DESIGNED TO UTILIZE ONLY 10 GPM.
   1.2. LOWEST PRESSURE AVAILABLE AT THE TAP IS 40 PSI. IF PRESSURE TESTED AT BACKFLOW IS LOWER THAN THIS, IRRIGATION SYSTEM MAY NOT OPERATE.
   1.3. CONTRACTOR SHALL PROGRAM CONTROLLER TO ENSURE ADEQUATE PRESSURES AND FLOWS ARE MAINTAINED THROUGHOUT SYSTEM FOR EQUIPMENT MANUFACTURER'S RECOMMEND OPTIMUM OPERATION (PER TOWN OF WELLINGTON).

2. ALL MAINLINES SHALL BE INSTALLED AT LEAST 5' FROM CENTER OF TREES, WHERE POSSIBLE. DESIGN IS SHOWN FOR CLARITY, THUS MAINLINE ROUTING IN FIELD MAY LOOK SLIGHTLY DIFFERENT THAN DEPICTED IN DRAWINGS.

3. CONTRACTOR SHALL CREATE A LAMINATED CONTROLLER CHART ADHERED TO THE INSIDE OF THE CONTROLLER COVER OR A LAMINATED COLORED CONTROLLER MAP.

4. CONTRACTOR SHALL BECOME FAMILIAR WITH THE SPECIFICATIONS AND INSTALLATION DETAILS FOR THIS AND RELATED WORK PRIOR TO CONSTRUCTION. FOR CLARIFICATION, CONTACT IRRIGATION DESIGNER PRIOR TO CONSTRUCTION.

   4.1. UPON FINAL ACCEPTANCE, CONTRACTOR SHALL TURN OVER REQUIRED ADJUSTMENT KEYS INCLUDING BUT NOT LIMITED TO CONTROLLER ENCLOSURE AND BACKFLOW ENCLOSURE KEY, LOCKING VALVE BOX KEYS, QUICK COUPLER KEYS, GATE VALVE KEY, SPRINKLER HEAD AND NOZZLE ADJUSTMENT KEYS.

   4.2. UPON FINAL ACCEPTANCE, CONTRACTOR SHALL TURN OVER SPARE PARTS PERTAINING TO INSTALLED SYSTEM: BACKFLOW WINTERIZATION INSERT, TWO OF EVERY HEAD AND NOZZLE (ROTOR NOZZLE TREE INCLUDED), ONE RCV DIAPHRAGM, ETC.

5. COORDINATE UTILITY LOCATES OF UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION ("811-CALL BEFORE YOU DIG") .

6. IF DISCREPANCIES ARE NOTED IN THE FIELD BETWEEN SITE CONDITIONS AND PROVIDED DESIGNS, CONTRACTOR SHALL NOTIFY OWNER'S REPRESENTATIVE OR GENERAL CONTRACTOR IMMEDIATELY. DO NOT PROCEED WITH THE INSTALLATION OF THE IRRIGATION SYSTEM IF SUCH DISCREPANCIES IN THE FIELD AFFECT THE PROVIDED DESIGN, DETAILS, OR SPECIFICATIONS.

7. ALL IRRIGATION COMPONENTS (MAINLINE, WIRES, LATERAL LINES, ETC.) SHALL BE INSTALLED IN LANDSCAPED AREAS WHENEVER POSSIBLE, EVEN THOUGH SAID IRRIGATION COMPONENTS MAY BE SHOWN OUTSIDE PLANTING AREAS FOR CLARITY.

8. AVOID CONFLICTS BETWEEN THE IRRIGATION SYSTEM, PLANTING MATERIALS, AND ARCHITECTURAL FEATURES WHENEVER POSSIBLE. COORDINATE POTENTIAL RELOCATION OF BOULDERS AND TREES IN TURF AREAS WITH LANDSCAPE ARCHITECT PRIOR TO SPRINKLER LAYOUT. IF LANDSCAPE MATERIAL CANNOT BE RELOCATED,ADDITIONAL SPRINKLERS MAY BE REQUIRED.
   8.1. WHERE POSSIBLE, MAINTAIN 3'-5' DISTANCE FROM CENTER OF TREE TO MAINLINE AND WIRES. VALVE BOXES SHALL BE AT LEAST 3' FROM TREE CENTER. MAINLINE ROUTING AND VALVE LOCATIONS ARE SHOWN FOR CLARITY AND MAY BE SHOWN WITHIN THE 3'-5' RANGE NOTED ABOVE.

9. CROSS FITTINGS ARE NOT ALLOWED, ONLY STANDARD TEES AND ELBOWS.

10. CONTRACTOR SHALL FIELD LOCATE ANY EXISTING SLEEVES ON SITE PRIOR TO CONSTRUCTION WITH THE AID OF THE GENERAL CONTRACTOR. MISSING SLEEVES SHALL BE REPORTED IMMEDIATELY. NEW SLEEVES SHOWN ON PLANS ARE REQUIRED FOR BOTH PIPING AND ELECTRICAL WIRING AT EACH HARDSCAPE CROSSING. COORDINATE INSTALLATION OF SLEEVING WITH OTHER TRADES. ANY PIPE OR WIRE WHICH PASSES BENEATH EXISTING HARDSCAPE WHERE SLEEVING WAS NOT INSTALLED WILL REQUIRE HORIZONTAL BORING BY THE IRRIGATION CONTRACTOR.

11. INSTALL ALL ELECTRICAL POWER TO THE IRRIGATION CONTROL SYSTEM IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE AND ALL APPLICABLE LOCAL ELECTRIC UTILITY CODES.

12. THE FOLLOWING SHOULD BE NOTED REGARDING PIPE SIZING: IF A SECTION OF UNSIZED PIPE IS LOCATED BETWEEN THE IDENTICALLY SIZED SECTIONS, THE UNSIZED PIPE IS THE SAME NOMINAL SIZE AS THE TWO SIZED SECTIONS. THE UNSIZED PIPE SHOULD NOT BE CONFUSED WITH THE DEFAULT PIPE SIZE NOTED IN THE LEGEND.

   12.1. MAINLINE PIPE SIZES MAY VARY THROUGHOUT PROJECT. EACH MAINLINE LEG IS SIZED TO ACCOMMODATE LARGEST VALVE ON THAT LEG. STATED SIZE IN LEGEND MAY NOT BE THE LARGEST SIZE ON PLANS.

13. INSTALL THREE (3) COLOR-CODED#14 AWG CONTROL WIRES FROM CONTROLLER LOCATION TO EACH DEAD-END OF MAINLINE FOR USE AS SPARES INCASE OF CONTROL WIRE FAILURE. COIL 3 FEET OF WIRE IN VALVE BOX.

14. TREES AND SHRUBS PLANTED IN NATIVE SEED WILL RECEIVE DRIP IRRIGATION PER PLAN, NOTES, DETAILS.
   14.1. TREES WILL UTILIZE INLINE DRIP TREE RINGS PER DETAILS AND LEGEND. BLANK DRIP TUBING IN BETWEEN PLANTS WILL BE UTILIZED. NO DRIP TUBING SHALL BE UTILIZED IN BETWEEN PLANTINGS.

15. NO IRRIGATION EQUIPMENT, INCLUDING BUT NOT LIMITED TO, MAINLINE, VALVES, AND SPRINKLERS, SHALL BE INSTALLED WITHIN 3' OF NEW BUILDING FOUNDATION.

16. CONTRACTOR IS RESPONSIBLE TO ESTABLISH ALL NATIVE GRASSES ON THE SITE USING NON-POTABLE WATER BY UTILIZING TEMPORARY IRRIGATION METHODS. ALL AREAS THAT FAIL TO ESTABLISH SHALL BE RE-SEEDED BY THE CONTRACTOR (PER TOWN OF WELLINGTON).

17. IRRIGATION SPRING STARTUP AND WINTERIZATION SHALL BE COMPLETED PER INDUSTRY STANDARDS.

REFERENCE NOTES SCHEDULE

SYMBOL	DESCRIPTION
1	THE IRRIGATION SYSTEM POINT-OF-CONNECTION (POC) SHALL BE DOWNSTREAM OF THE DOMESTIC WATER TAP AND METER AT THE APPROXIMATE LOCATION SHOWN (REFER TO CIVIL PLANS FOR EXACT LOCATION). INSTALL BACKFLOW PREVENTION UNIT, MASTER VALVE ASSEMBLY, AND FLOW SENSOR AS INDICATED. VERIFY EXACT LOCATION OF POC WITH OWNER`S REPRESENTATIVE. VERIFY PRESSURE AND FLOW ON SITE PRIOR TO CONSTRUCTION. CONTRACTOR TO INSTALL BACKFLOW PER NATIONAL PLUMBERS CODE AND PER LOCAL CODE. BACKFLOW SHALL BE TESTED UPON INSTALLATION AND ANNUALLY THEREAFTER.
2	PEDESTAL MOUNT THE IRRIGATION CONTROLLER AT THE APPROXIMATE LOCATION SHOWN. COORDINATE ELECTRICAL POWER TO THE CONTROLLER WITH THE OWNER`S REPRESENTATIVE. CARE SHOULD BE TAKEN TO INSTALL THE IRRIGATION CONTROLLER IN A LOCATION THAT IS ACCESSIBLE FOR MAINTENANCE, AND SCREENED FROM VIEW EITHER BEHIND ENTRY WALLS, NEXT TO BUILDINGS, OR BEHIND PLANT MATERIAL. FINAL LOCATION TO BE APPROVED BY OWNER`S REPRESENTATIVE. CONTROLLER TO BE INSTALLED PER NATIONAL ELECTRIC CODE.

EMITTER SCHEDULE

PLANT TYPE	EMITTER TYPE	GPH/OUTLET	N0. OF EMITTERS	TOTAL FLOW
GROUNDCOVER	SINGLE OUTLET	1 GPH	1	1 GPH
PERENNIALS	SINGLE OUTLET	1 GPH	1	1 GPH
1 GAL. SHRUB	SINGLE OUTLET	1 GPH	1	1 GPH
5 GAL. SHRUB	SINGLE OUTLET	1 GPH	2	2 GPH
TREE IN SHRUB BED	SINGLE OUTLET	1 GPH	4-8	4-8 GPH
TREE IN NATIVE SEED	INLINE DRIP	0.6 GPH	N/A	N/A

NOTES:
1. MULTIPLE OUTLET EMITTERS CAN BE UTILIZED IN DENSELY PLANTED AREAS AND FOR TREES IN SHRUB BEDS.
2. NETAFIM TECHLINE CV DRIP TUBING MODEL TLCV6-18 FOR NATIVE TREE RINGS.
3. UTILIZE RAINBIRD PRESSURE COMPENSATING SINGLE OUTLET EMITTERS (XB-10PC), OR EQUAL AT 20PSI-30PSI OPERATING PRESSURE.

MPi Designs
PO BOX 369 • AULT, CO • 80610
970-402-3047
Michelle@MPiDesignsllc.com

0 10 20 40

NORTH

ditesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado 80525
Phone: 970.223.5556
www.ditescoservices.com

P.E. Seal

SHEET STATUS

90% PLAN SET
NOT FOR
CONSTRUCTION

IRRIGATION PLAN

DESIGNED BY: MLP
DRAWN BY: MLP
APPROVED BY: TEAM
DATE: FEBRUARY 8, 2023
SCALE:
FILE NAME:

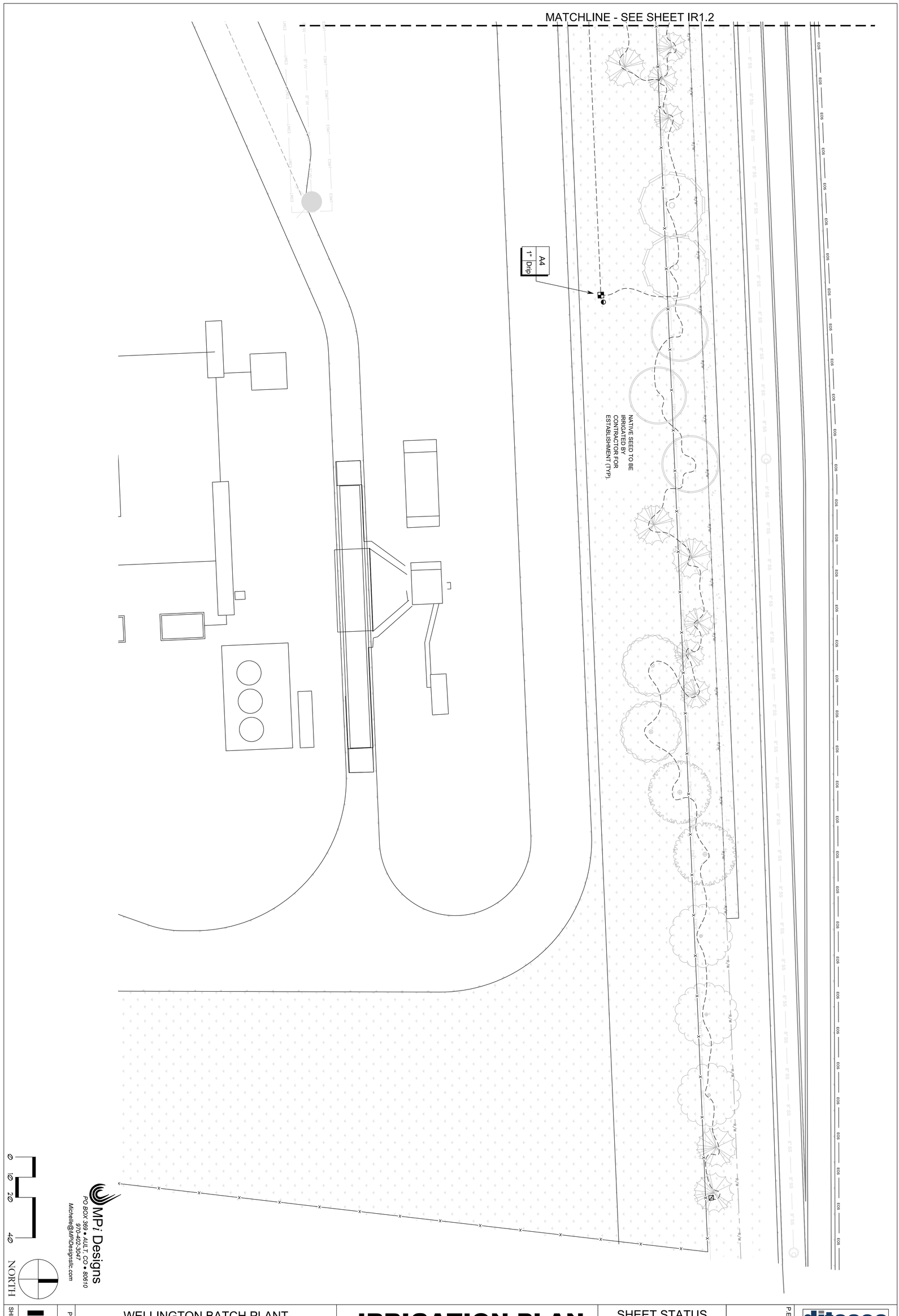
WELLINGTON BATCH PLANT
CONNELL RESOURCES

CONNELL

PROJECT NUMBER: 25034

SHEET NUMBER
IR1.0

SHEET INDEX: **23**



MPJ Designs
PO BOX 369 • AULT, CO • 80610
970-402-3047
Michelle@MPJDesignsllc.com

WELLINGTON BATCH PLANT
CONNELL RESOURCES

CONNELL

IRRIGATION PLAN

DESIGNED BY:	MLP	DATE:	FEBRUARY 8, 2023
DRAWN BY:	MLP	SCALE:	
APPROVED BY:	TEAM	FILE NAME:	

SHEET STATUS

90% PLAN SET
NOT FOR CONSTRUCTION

P.E. Seal

ditesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado 80525
Phone: 970.632.5068
www.ditescoservices.com

SHEET INDEX: 24

SHEET NUMBER
IR1.1

PROJECT NUMBER:
25034

MATCHLINE - SEE SHEET IR1.1

NATIVE SEED TO BE IRRIGATED BY CONTRACTOR FOR ESTABLISHMENT (TYP).

A3
1" | Drip

2 CONTROLLER 'A'
120 VAC POWER REQUIRED

(1)6"&(2)3"

POC NO.1 1
TAP & METER SIZE: 3/4-INCH
PEAK DEMAND: 10 GPM
AVAILABLE PRESSURE: 40-50 PSI

DOMESTIC METER. REFER TO CIVIL PLANS.

(1)6"&(2)3"

A2
1" | Drip

MATCHLINE - SEE SHEET IR1.3

0 10 20 40

NORTH

MPi Designs
PO BOX 369 • AULT, CO • 80610
970-402-3047
Michelle@MPiDesignsllc.com

ditesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado 80525
Phone: 970.221.5053
www.ditescoservices.com

P.E. Seal

SHEET STATUS

90% PLAN SET
NOT FOR CONSTRUCTION

IRRIGATION PLAN

DESIGNED BY:	MLP
DRAWN BY:	MLP
APPROVED BY:	TEAM
DATE:	FEBRUARY 8, 2023
SCALE:	
FILE NAME:	

WELLINGTON BATCH PLANT
CONNELL RESOURCES

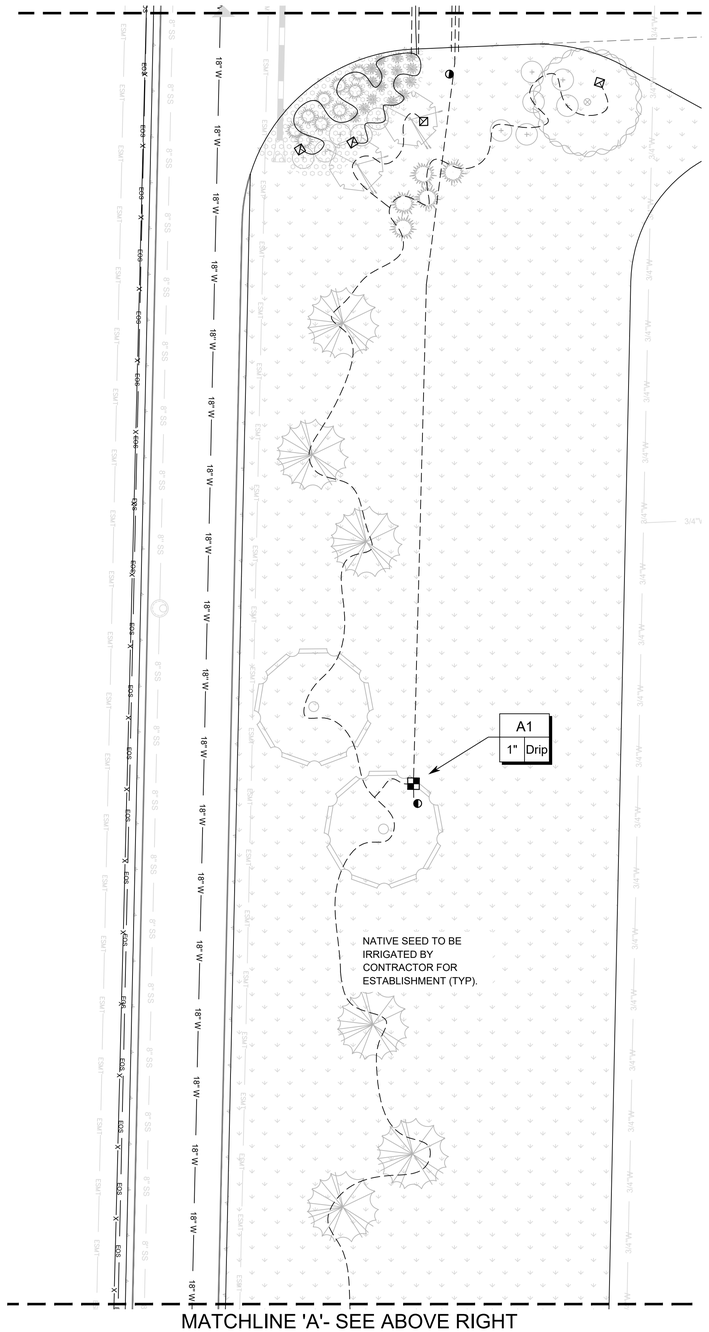
CONNELL

PROJECT NUMBER: 25034

SHEET NUMBER
IR1.2

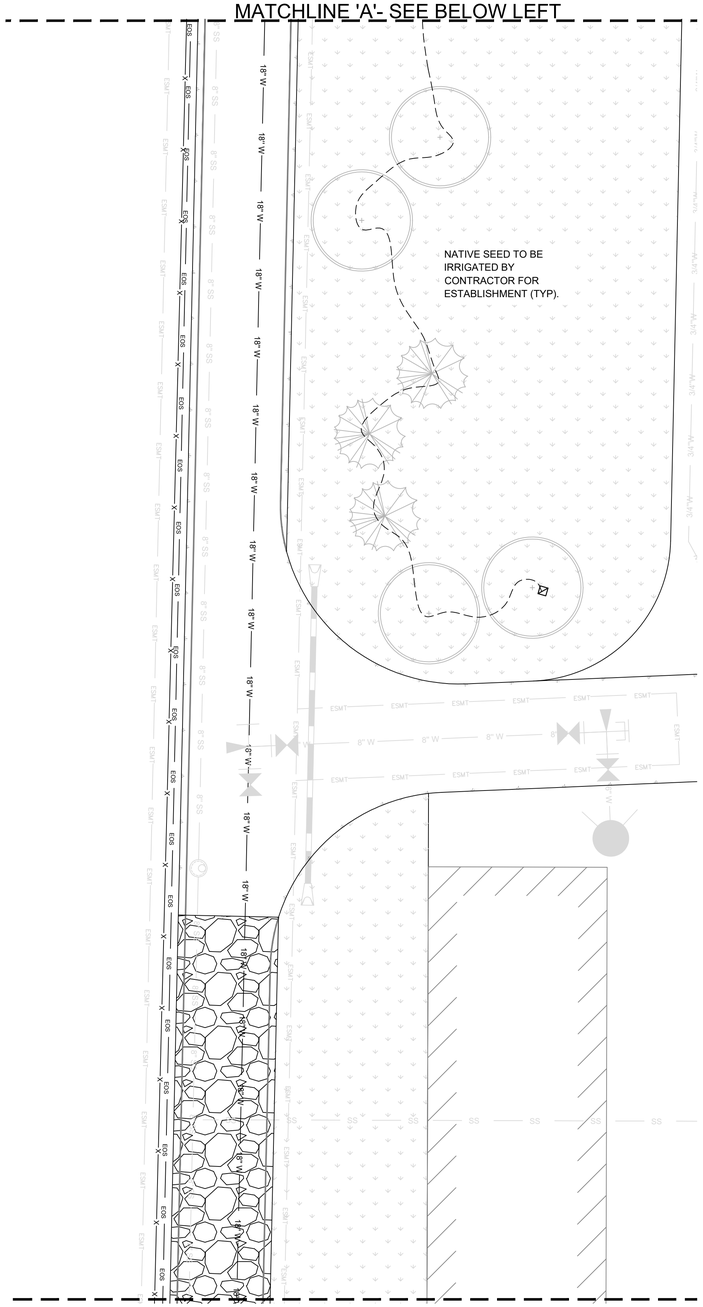
SHEET INDEX: **25**

MATCHLINE - SEE SHEET IR1.2



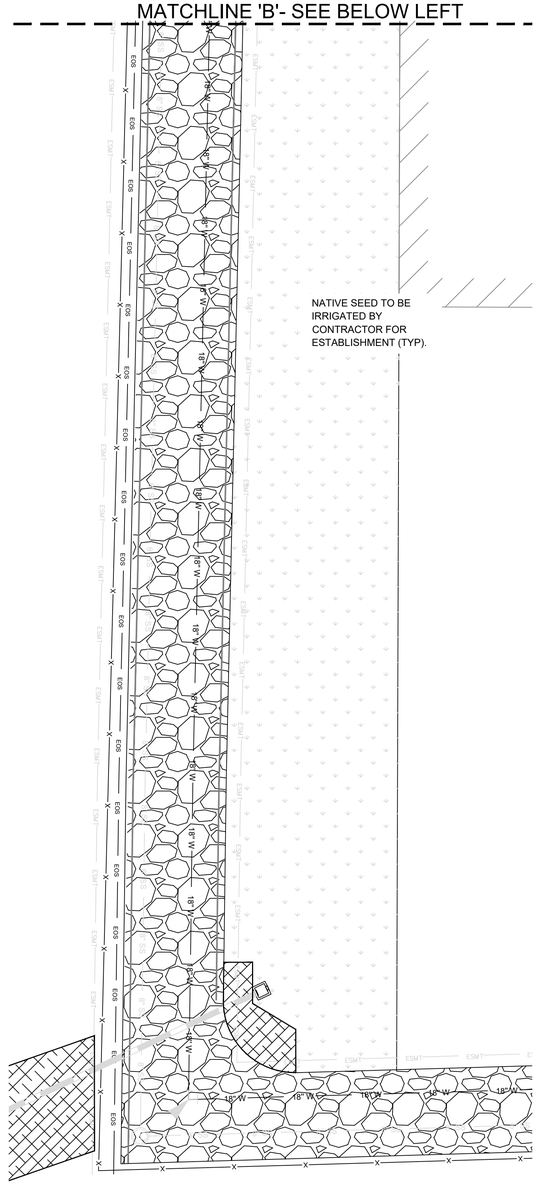
MATCHLINE 'A'- SEE ABOVE RIGHT

MATCHLINE 'A'- SEE BELOW LEFT



MATCHLINE 'B'- SEE ABOVE RIGHT

MATCHLINE 'B'- SEE BELOW LEFT



ditesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado 80525
Phone: 970.672.8064
www.ditescoservices.com

P.E. Seal

SHEET STATUS

90% PLAN SET
NOT FOR CONSTRUCTION

IRRIGATION PLAN

DESIGNED BY:	MLP
DRAWN BY:	MLP
APPROVED BY:	TEAM
DATE:	FEBRUARY 8, 2023
SCALE:	
FILE NAME:	

WELLINGTON BATCH PLANT
CONNELL RESOURCES

CONNELL

MPi Designs
PO BOX 369 • AULT, CO • 80610
970-402-3047
Michelle@MPiDesignsllc.com

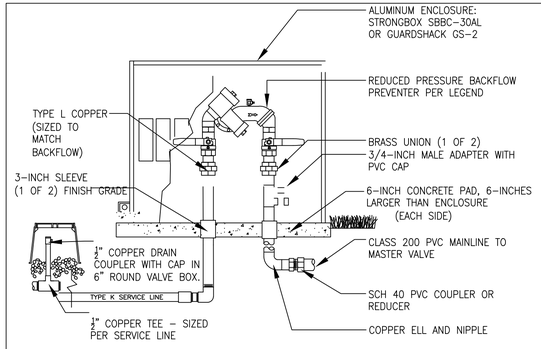
0 10 20 40

NORTH

PROJECT NUMBER: 25034

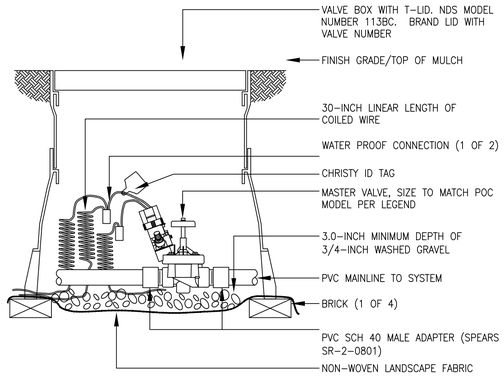
SHEET NUMBER
IR1.3

SHEET INDEX: 26



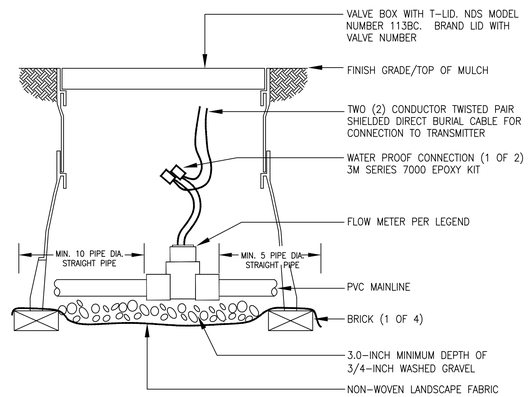
NOTES:
1. INSTALL BACKFLOW DEVICE IN ACCORDANCE WITH ALL STATE AND LOCAL CODE REQUIREMENTS.
2. SLOPE TOP SURFACE OF PAD AT 0.5 % WITH BROOM FINISH. MAKE PIPE SLEEVES WITH 1-1/2 INCH LARGER DIAMETER PIPE THAN PENETRATING PIPE SIZE.
3. ALL HINGED CONNECTION LOCATIONS AND HARDWARE TO BE TAMPER PROOF.
4. ALL WELD JOINTS SHALL BE CONTINUOUS AND GROUND SMOOTH.

1 BACKFLOW PREVENTION UNIT

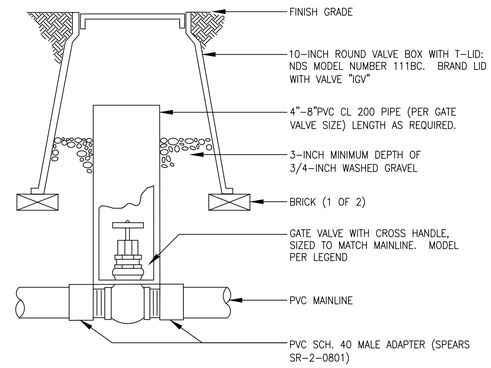


NOTE:
1. FOR 2-WIRE CONTROL SYSTEMS, DIRECT WIRE MASTER VALVE INTO MV SENSOR PORT. DECODER IS AN OPTIONAL CONNECTION.

2 MASTER VALVE ASSEMBLY

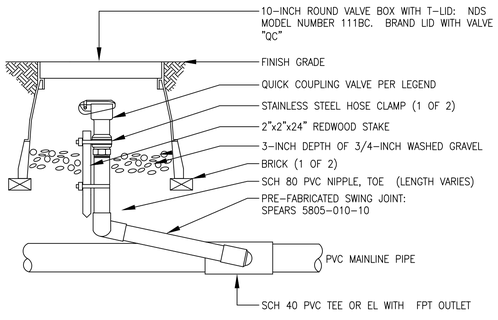


3 FLOW SENSOR ASSEMBLY

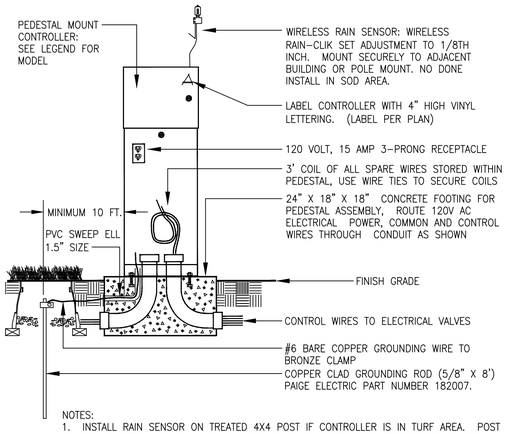


NOTES:
1. NOMINAL SIZE OF GATE VALVE TO MATCH NOMINAL MAINLINE SIZE.

4 ISOLATION GATE VALVE ASSEMBLY

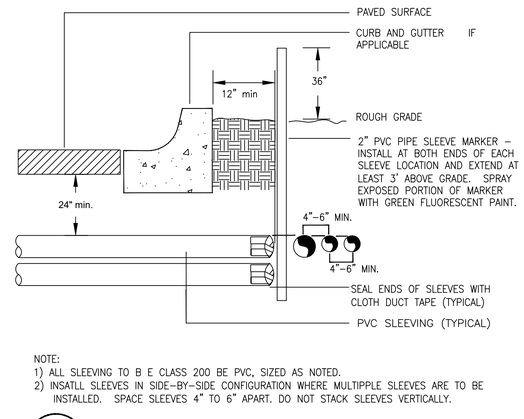


5 QUICK COUPLING VALVE ASSEMBLY



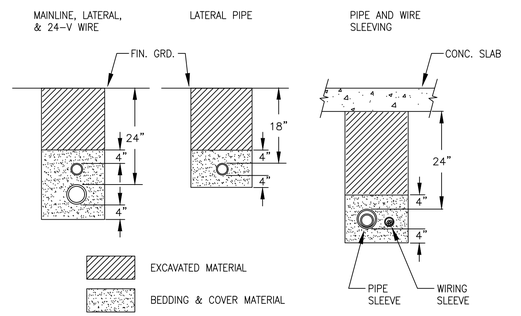
NOTES:
1. INSTALL RAIN SENSOR ON TREATED 4X4 POST IF CONTROLLER IS IN TURF AREA. POST TO BE MOUNTED IN SHRUB BED TO AVOID BEING IRRIGATED BY OVERHEAD SPRINKLERS.

6 PEDESTAL MOUNT CONTROLLER ASSEMBLY



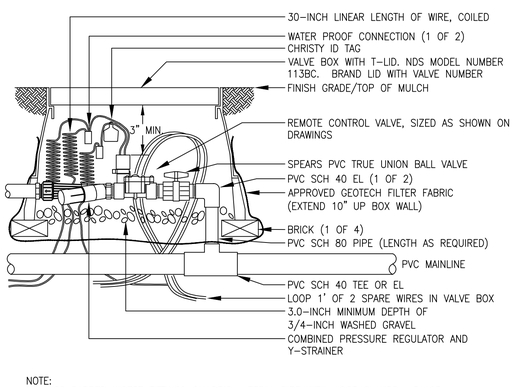
NOTE:
1) ALL SLEEVING TO B E CLASS 200 BE PVC, SIZED AS NOTED.
2) INSATLL SLEEVES IN SIDE-BY-SIDE CONFIGURATION WHERE MULTIPPLE SLEEVES ARE TO BE INSTALLED. SPACE SLEEVES 4" TO 6" APART. DO NOT STACK SLEEVES VERTICALLY.

7 TYPICAL SLEEVING DETAIL



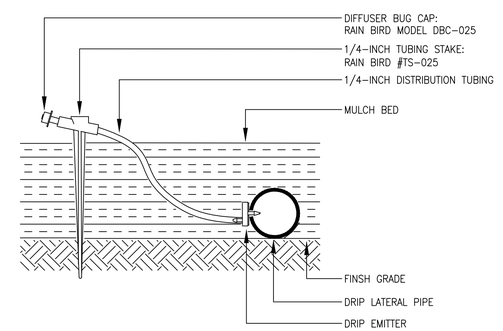
NOTES:
1. SLEEVE ALL PIPE AND WIRE SEPARATELY.
2. ALL PIPE TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. "SNAKE" UNSLEEVED PLASTIC PIPE IN TRENCH. PROVIDE A MINIMUM OF 2" CLEARANCE TO SIDE OF TRENCH AND BETWEEN PIPES.
3. ALL 120-V WIRING SHALL BE INSTALLED IN ACCORDANCE WITH LOCAL CODE REQUIREMENTS. TAPE AND BUNDLE 24-V WIRE EVERY 10' AND PROVIDE LOOSE 20" LOOP AT ALL CHANGES OF DIRECTION OVER 30 DEGREES.

8 TYPICAL TRENCHING DETAIL

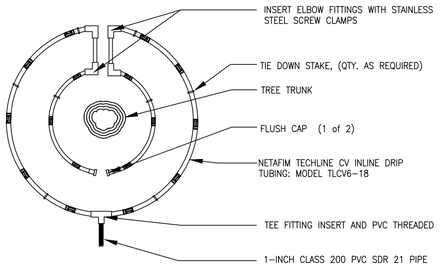


NOTE:
1. USE BARBED INSERT FITTINGS ON DRIP LATERAL PIPE WITH HOSE CLAMPS. PLACE CLAMPS ON DRIP TUBING DIRECTLY OVER BARBED AREA OF FITTING. PINCH CLAMPS ARE NOT ACCEPTABLE.
2. UTILIZE RAIN BIRF XCZ-LF-100-PRF FOR FLOWS LESS THAN 5 GPM.

9 REMOTE CONTROL DRIP VALVE ASSEMBLY

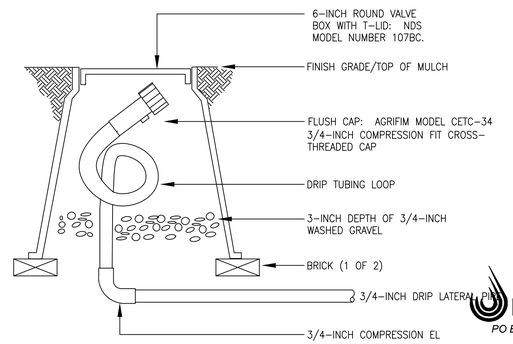


10 SINGLE OUTLET EMITTER ASSEMBLY



NOTE:
1. CONTRACTOR SHALL INSTALL ALL DRIP TUBING IN NATIVE AREAS 2-3" BELOW GRADE IF MULCH IS NOT PRESENT. IF MULCH IS PRESENT, LAY TUBING ON FINISHED GRADE BELOW MULCH.
2. DIAMETER OF DRIPLINE RINGS ARE DEPENDENT ON TREE CANOPY SIZE AND SHALL BE ADJUSTED IN THE FIELD PER CONTRACTOR. SUGGESTED PLACEMENT OF 2' DIAMETER AND 3' DIAMETER AROUND TREE.
3. SHRUBS IN NATIVE SHALL UTILIZE SINGLE OUTLET EMITTERS.

11 INLINE DRIP PIPE ASSEMBLY FOR TREES IN NATIVE



NOTE:
1. LOOP IRRIGATION DRIP TUBING INSIDE VALVE BOX FOR EXTENSION OUTSIDE OF BOX DURING BLOWOUT.

12 DRIP FLUSH CAP ASSEMBLY

MPi Designs
PO BOX 369 • AULT, CO • 80610
970-402-3047
Michelle@MPiDesignsllc.com

0 10 20 40

NORTH

ditesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado 80525
Phone: 970.221.4158
www.ditescoservices.com

P.E. Seal

SHEET STATUS
90% PLAN SET
NOT FOR CONSTRUCTION

IRRIGATION DETAILS

DESIGNED BY:	MLP	DATE:	FEBRUARY 8, 2023
DRAWN BY:	MLP	SCALE:	
APPROVED BY:	TEAM	FILE NAME:	

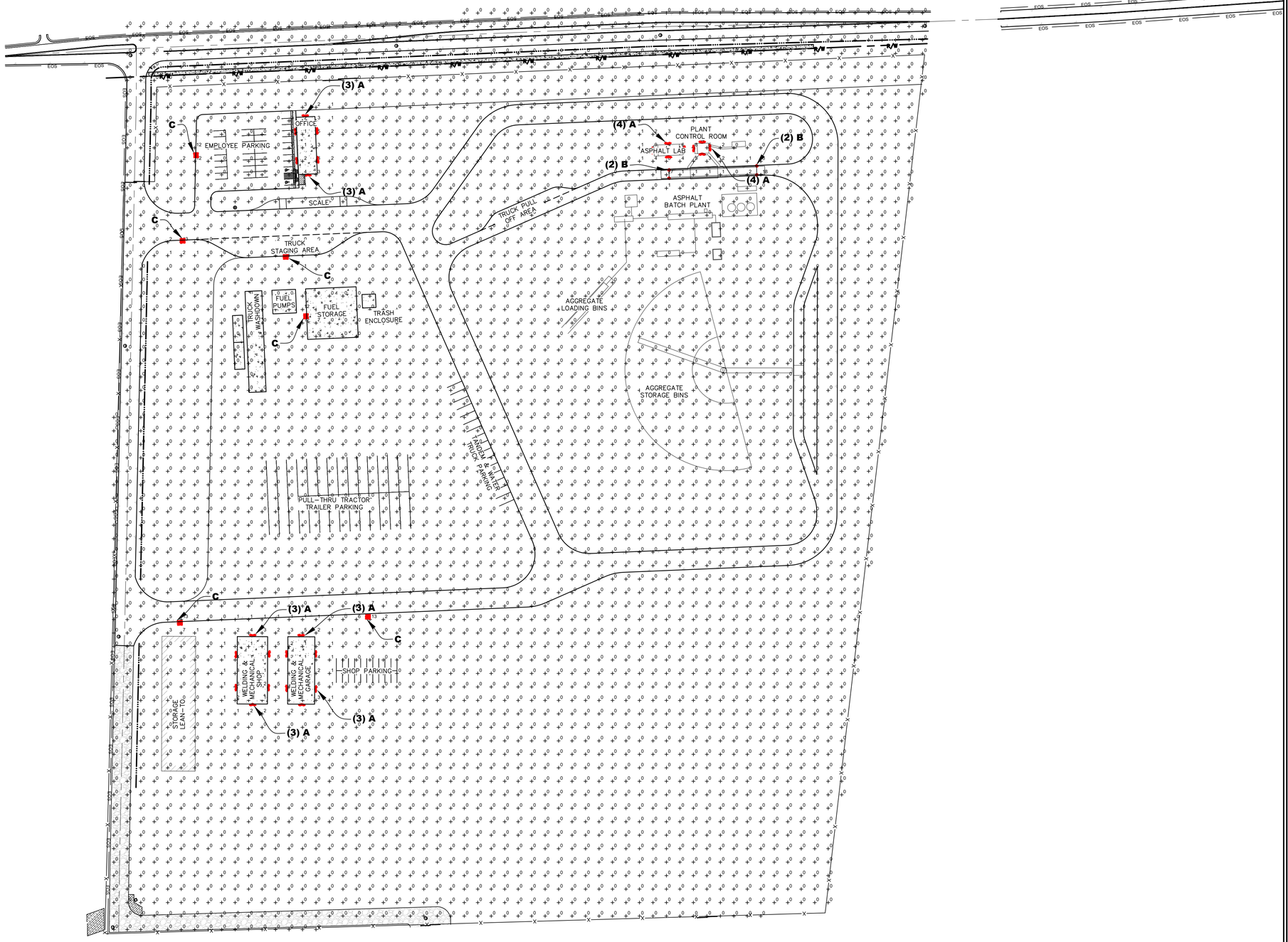
WELLINGTON BATCH PLANT
CONNELL RESOURCES

CONNELL

PROJECT NUMBER: 25034

SHEET NUMBER
IR2.1

SHEET INDEX: **27**



80' 0 80' 160' 240'

SCALE: 1" = 80'
(True scale for 22x34 sheet size)

LEGEND:

- PHOTOMETRIC CALCULATION POINT (FOOT CANDLES)
- FIXTURE TYPE A
- FIXTURE TYPE B
- FIXTURE TYPE C
- SITE PROPERTY LINE — PA —
- EXISTING RIGHT OF WAY — R/W —
- PROPOSED RIGHT OF WAY — R/W —
- PROPOSED EDGE OF ASPHALT
- PROPOSED EDGE OF SHOULDER — EOS —
- EDGE OF GRAVEL ROAD
- PROPOSED SWALE
- PROPOSED CHAIN LINK FENCE
- PROPOSED 2-STRAND BARB-WIRE — X —

NOTES:

1. PHOTOMETRIC VALUES ARE BASED UPON PLACEMENT OF FIXTURES AS SHOWN IN THE FIXTURE SCHEDULE ON P102.
2. BATCH PLANT OPERATIONS PRIMARILY OCCUR DURING DAYLIGHT HOURS. FIXTURES WILL BE INSTALLED TO PROVIDE SAFETY LIGHTING AT THE OFFICE AND A KEY OPERATIONAL LOCATIONS AROUND THE SITE.
3. ALL NEW ELECTRICAL INFRASTRUCTURE ROUTED TO NEW LIGHT POLES / WALL PACKS, AS APPLICABLE.

dltesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado 80525
Phone: 970.530.8080
www.dltescoservices.com

P.E. Seal

Sheet Revisions

No.	Revisions:	By:	Date:

PHOTOMETRICS PLAN

DATE: February 8, 2023
SCALE: 1" = 80'
FILE NAME: Batch Plant Photometrics-Plan.dwg

DESIGNED BY: D. Egger
DRAWN BY: R. Bunner
APPROVED BY: J. Burrell

WELLINGTON BATCH PLANT
CONNELL RESOURCES

CONNELL

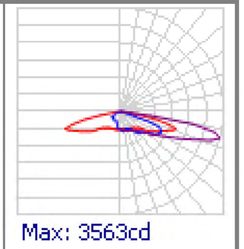
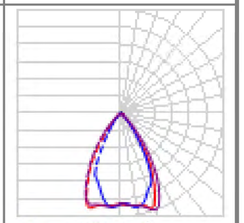
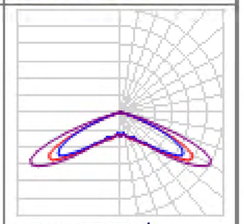
PROJECT NUMBER: XXXX

SHEET NUMBER
P101

SHEET INDEX: 28

Drawing Name: D:\Projects\Wellington Batch Plant\Dwg\Sheets\Batch Plant Photometrics-Plan.dwg Thursday, February 09, 2023 2:06 PM By: Rhonda Bunner

Schedule

Symbol	Label	Image	QTY	Manufacturer	Catalog	Description	Number Lamps	Lamp Output	LLF	Input Power	Polar Plot
	A		26	Holophane	HLWPC2 P20 30K XX T4M XXXXX 80CRI	Wallpack Full Cutoff LED, LED Performance Package P10, 3000 series CCT, Voltage, Type IV Medium with 80 CRI LEDs	1	4745	1	47	 Max: 3563cd
	B		4	Holophane	PSLED P1 XXXXX 55 30K	Predator Small LED Floodlight with P1 Performance Package, Flood (5x5) (formally FL), 3000K CCT	1	Absolute	1	37	 Max: 5477cd
	C		6	Holophane	MGLEDM P1 30K XXXXX AG	Mongoose Medium, P1 Performance Package, 3000K, Area (Type 5) with Refractor	1	15680	1	104.9	 Max: 6525cd

dtesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado 80525
Phone: 970.530.8080
www.dtescoservices.com

P.E. Seal

Sheet Revisions

No.	Revisions:	By	Date:

PHOTOMETRICS SCHEDULE

DESIGNED BY: D. Egger
DRAWN BY: R. Bunner
APPROVED BY: J. Burrell

DATE: February 8, 2023
SCALE: NTS
FILE NAME: Batch Plant Photometrics.dwg

WELLINGTON BATCH PLANT
CONNELL RESOURCES

CONNELL

PROJECT NUMBER: XXXX

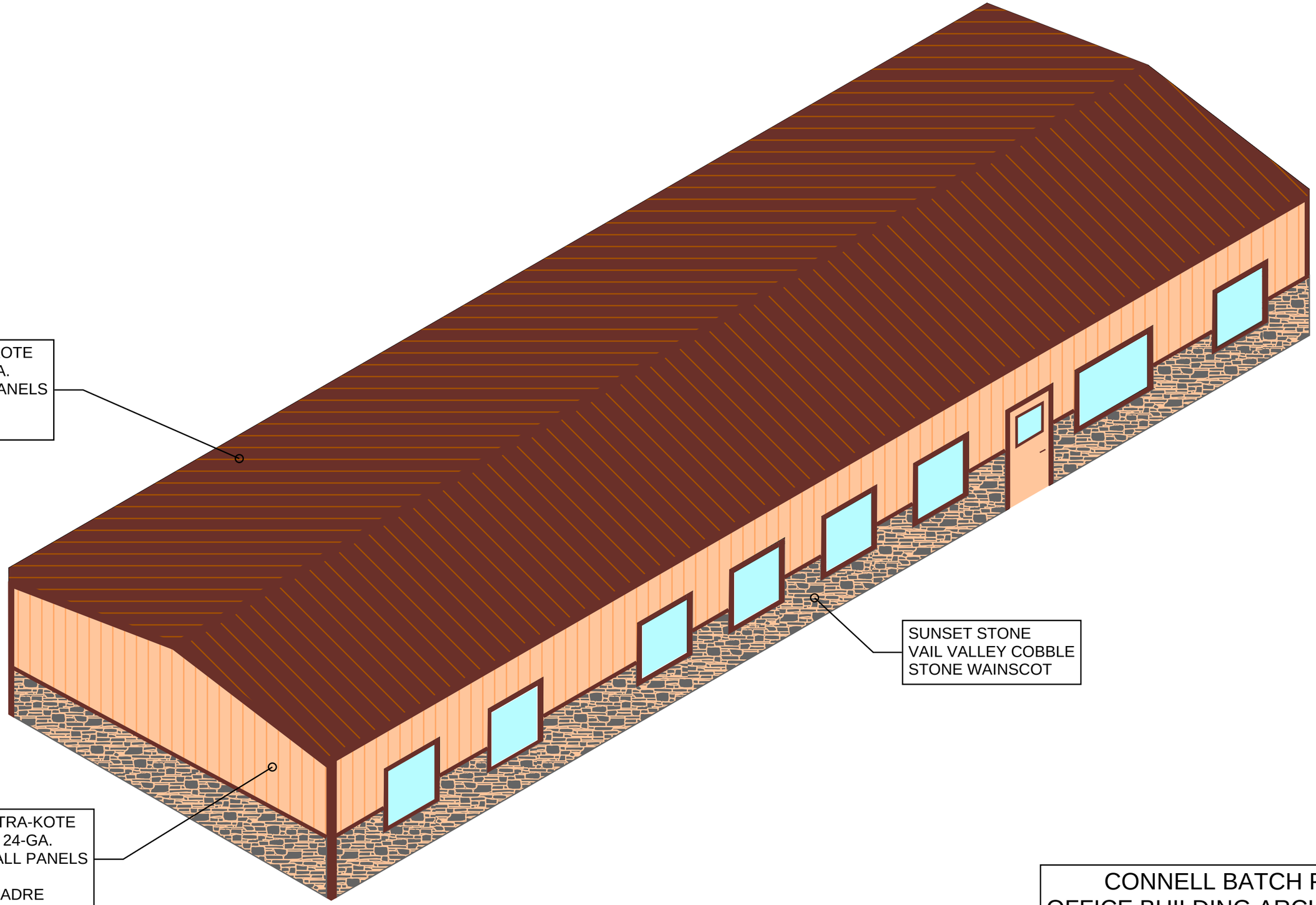
SHEET NUMBER
P102

SHEET INDEX: 29

Drawing Name: D:\Projects\Wellington Batch Plant\Dwg\Sheets\Batch Plant Photometrics.dwg Friday, January 27, 2023 3:14 PM By: Rhonda Bunner

CHIEF ULTRA-KOTE
PREMIUM 24-GA.
STEEL ROOF PANELS

CHEROKEE



SUNSET STONE
VAIL VALLEY COBBLE
STONE WAINSCOT

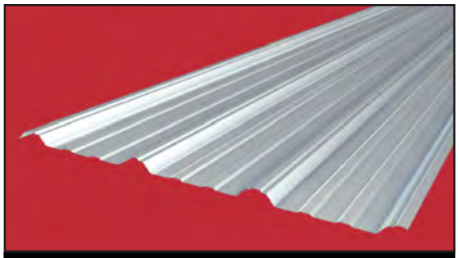
CHIEF ULTRA-KOTE
PREMIUM 24-GA.
STEEL WALL PANELS

SIERRA MADRE

CONNELL BATCH PLANT
OFFICE BUILDING ARCHITECTURE
SAMPLE MATERIAL SUBMITTALS

CS/AP Panels

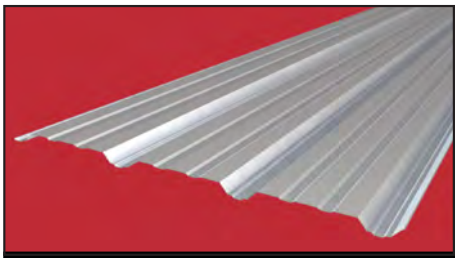
Ultra-Kote Premium (PVDF)



CS - Chief Standard
(Roof and Wall Panel)
36" Coverage

Superior materials make the difference...

Premium finishes and design give Chief's Standard Panels (CS) and Chief's Architectural Panels (AP) the edge when it comes to quality steel roof and wall panels. They're ideal for a variety of other applications as well. Interior liners, fascias, canopies, and soffits are just some of the many uses for this versatile panel. With a 1 1/8" deep corrugation for added strength, 36" panel widths for quicker erection and availability in many different colors, Chief's CS and AP ribbed panels are the perfect choice for your construction project.

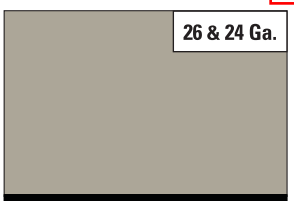


AP - Architectural Panel
(Wall Panel Only)
36" Coverage

ROOF PANELS

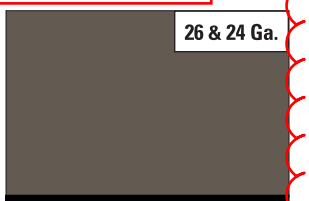
26 & 24 Ga.

Antique Bronze (AQ)



26 & 24 Ga.

Ash Gray (AG)

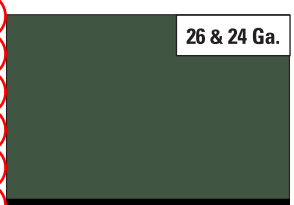


26 & 24 Ga.

Charcoal Gray (CG)

26 & 24 Ga.

Cherokee (CK)

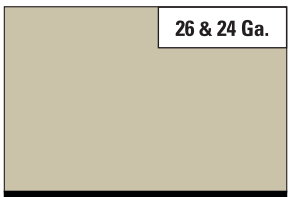


26 & 24 Ga.

Emerald Green (EG)

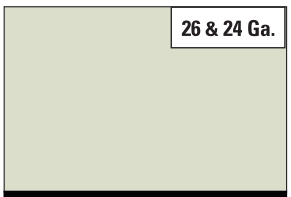
26 & 24 Ga.

Fieldstone (FS)



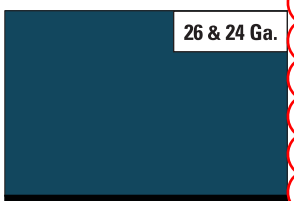
26 & 24 Ga.

Parchment (PA)



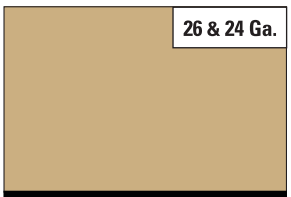
26 & 24 Ga.

Polar White (PW)



26 & 24 Ga.

Royale Blue (RB)

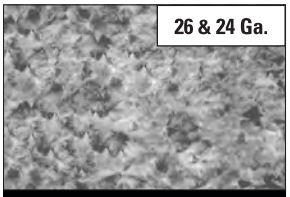


26 & 24 Ga.

Sierra Madre (SM)

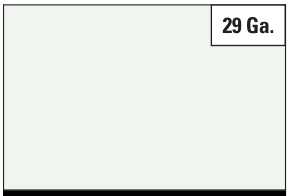
*Chief maintains inventory of all 26 Ga. Chief standard colors, 24 Ga. Polar White and 24 Ga. Galvalume. All other colors are available as Chief standard colors and may not be in stock.

WALL PANELS



26 & 24 Ga.

Galvalume (GM)



29 Ga.

White Polyester (WP)

Ultra-Kote Premium (UKP) Finish

Chief's Ultra-Kote Premium finish is made with polyvinylidene fluoride resin, where a minimum of 70% of the resin is PVDF (Kynar 500® or Hylar 5000®). This unique chemistry is combined with acrylic resin, as well as ceramic and select inorganic pigmentation. The result is Ultra-Kote Premium's proven ability to resist ultraviolet radiation in sunlight for maximum protection against general weathering effects, chalking and fading.

Acrylic Coated Galvalume® (GM)

Chief's exterior roof, wall and trim material is available in an industry standard ASTM A792 Acrylic Coated Galvalume® finish. Galvalume® is a unique coating of 55% aluminum and 45% zinc that resists corrosion. The Galvalume® sheet is coated with a thin, clear acrylic coating applied to both sides.

White Polyester (WP)

Chief's White Polyester is an economical polyester finish intended for interior applications only.
Note: 29 Ga. White polyester is a non-warranty product.

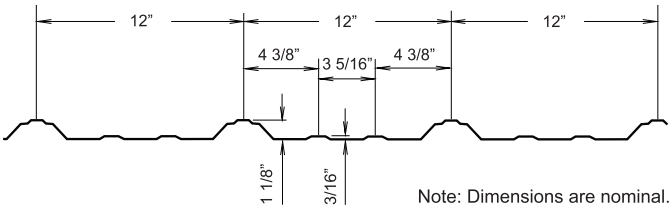
Since all color chips are affected by age, lighting conditions, heat and mechanical coating processes, the chips on this page may vary slightly in color or finish from the actual product. Oil canning in the flat areas of panels is inherent of coil steel products and shall not be a cause for product refusal. Chief reserves the right to change designs, prices and specifications at any time without notice.

Chief's Finish Warranties:

- Galvalume® Panel Limited Warranty - 25 Year
- Ultra-Kote Premium Roof Panel Finish Limited Warranty - 35 Year
- Ultra-Kote Premium Wall Panel Finish Limited Warranty - 35 Year

MEMBER MBMA METAL BUILDING MANUFACTURERS ASSOCIATION

1821 S. North Road P.O. Box 2078 Grand Island, NE 68802-2078 (308) 389-7281 fax: (308) 389-7282 http://www.chiefbuildings.com



Note: Dimensions are nominal.

Ribbed roof panel

a. Rollformed profile shall be CS (Chief Standard) configuration as manufactured by Chief Buildings. Panels shall have 1 1/8" deep major ribs spaced at 12" on center, with minor ribs between major ribs. Each panel shall provide a net coverage width of 36".
b. Panels shall be manufactured from 26 gauge or 24 gauge, 80,000 PSI material.
c. Provide roof panel assemblies with permanent resistance to air leakage through assembly of not more than 0.005 cfm/sf of fixed roof area when tested according to ASTM E1680 at a static pressure differential of 6.24 psf.
d. Provide roof panel assemblies with no water penetration as defined in the test method when tested according to ASTM E1646 at a static pressure differential of 12.0 psf.
e. Provide roof panel assemblies with UL Class 30, 60, or 90 uplift rating in accordance with UL 580 “Tests for Uplift Resistance of Roof Assemblies”.
f. Provide roof panel assemblies with UL Class A Fire Rating in accordance with UL 790 “Test Methods for Fire Tests of Roof Coverings”.
g. Provide roof panel assemblies with UL Class 4 Impact Rating in accordance with UL 2218 “Impact Resistance of Prepared Roof Covering Material”.
h. Panels shall be one piece for slope lengths less than 39'-6". Endlaps, if required, shall be 8" and occur at a purlin.
i. Panel finish shall be acrylic coated Galvalume® AZ55 coating in accordance with ASTM A792.

OR

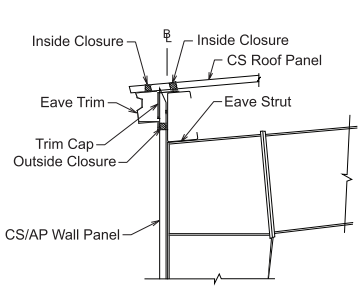
i. Substrate shall be Galvalume® AZ50 coating in accordance with ASTM A792. Sheets shall be coated with a fluoropolymer topcoat containing not less than 70% polyvinylidene fluoride (PVDF) over primer with total DFT of 0.8–1.0. The reverse side shall be coated with pigmented. Exterior color to be selected from Chief standard color choices.

Exterior wall panel

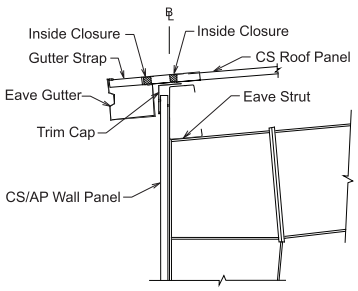
a. Rollformed profile shall be CS (Chief Standard) or AP (Architectural Panel) configuration as manufactured by Chief Buildings. Panels shall have 1 1/8" deep major ribs spaced at 12" on center, with minor ribs between major ribs. Each panel shall provide a net coverage width of 36".
b. Manufactured from 26 gauge or 24 gauge, 50,000 PSI or 80,000 PSI material.
c. Provide wall panel assemblies (when installed with mastic in the walls) with permanent resistance to air leakage through assembly of not more than 0.006 cfm/sf of fixed wall area when tested according to ASTM E283 at a static pressure differential of 6.24 psf.
d. Provide wall panel assemblies (when installed with mastic in the walls) with no water penetration as defined in the test method when tested according to ASTM E331 at a static pressure differential of 12.0 psf.
e. Substrate shall be Galvalume® AZ50 coating in accordance with ASTM A792.
f. Sheets shall be coated with a fluoropolymer topcoat containing not less than 70% polyvinylidene fluoride (PVDF) over primer with total DFT of 0.8–1.0. The reverse side shall be coated with pigmented polyester. Exterior color to be selected from Chief standard color choices.

Galvalume® is a registered trademark of BIEC International, Inc.
Kynar 500® is a registered trademark of Arkema Inc.
Hylar 5000® is a registered trademark of Solvay Solexis Inc.

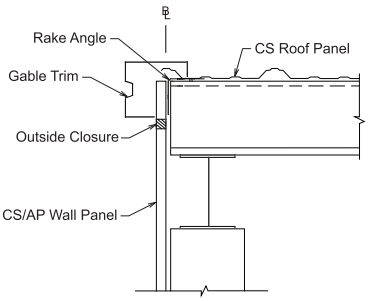
Eave Trim



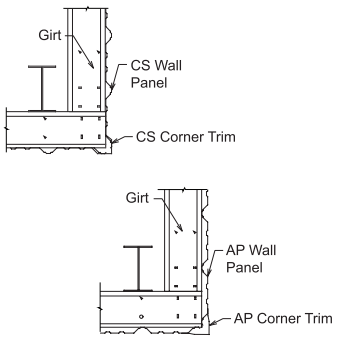
Eave Gutter



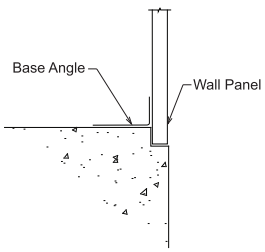
Gable Trim



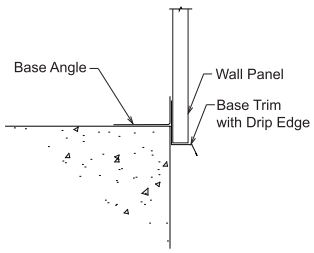
Outside Corner



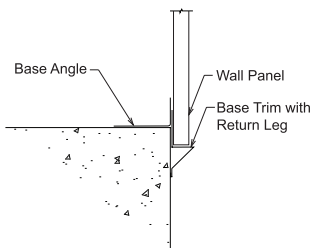
Notch in Concrete



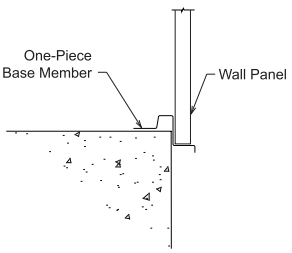
Base Trim with Drip Edge



Base Trim with Return Leg



One Piece Base Member



Natural Ledge

Welcome to Sunset Stone

Cobble

- 2½" to 8" high
- 8" to 22" long
- 1½" to 2" thick

Custom Cobble

Custom Cobble

Natural Cobble

Ponderosa Cobble

Gold Rundle Cobble

Vail Valley Cobble

Venetian Cobble

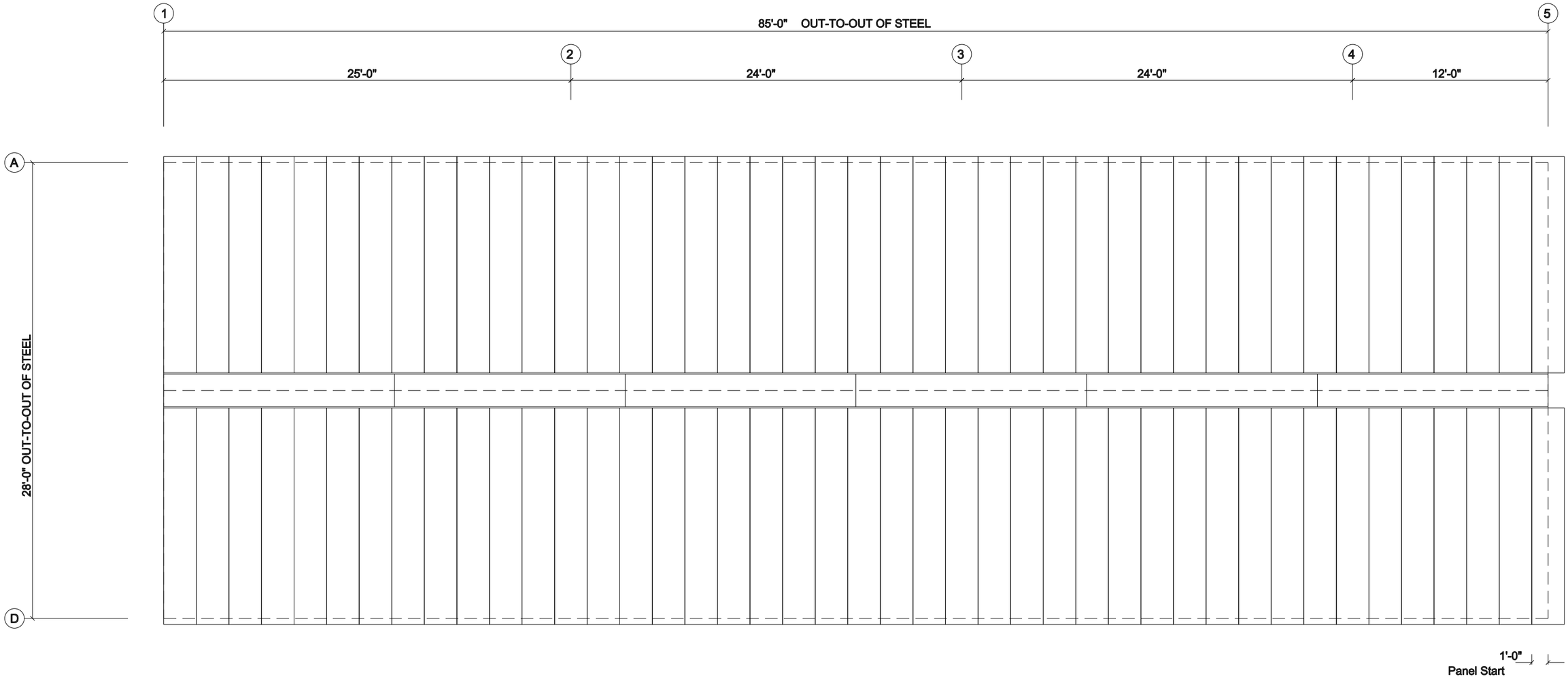
Cheyenne Cobble

Country Cobble

Alpine Cobble

Solterra Cobble

Colorado Cream Cobble



ROOF SHEETING PLAN

PANELS: 24 Ga. MSC - Galvalume (GM)

PRELIMINARY

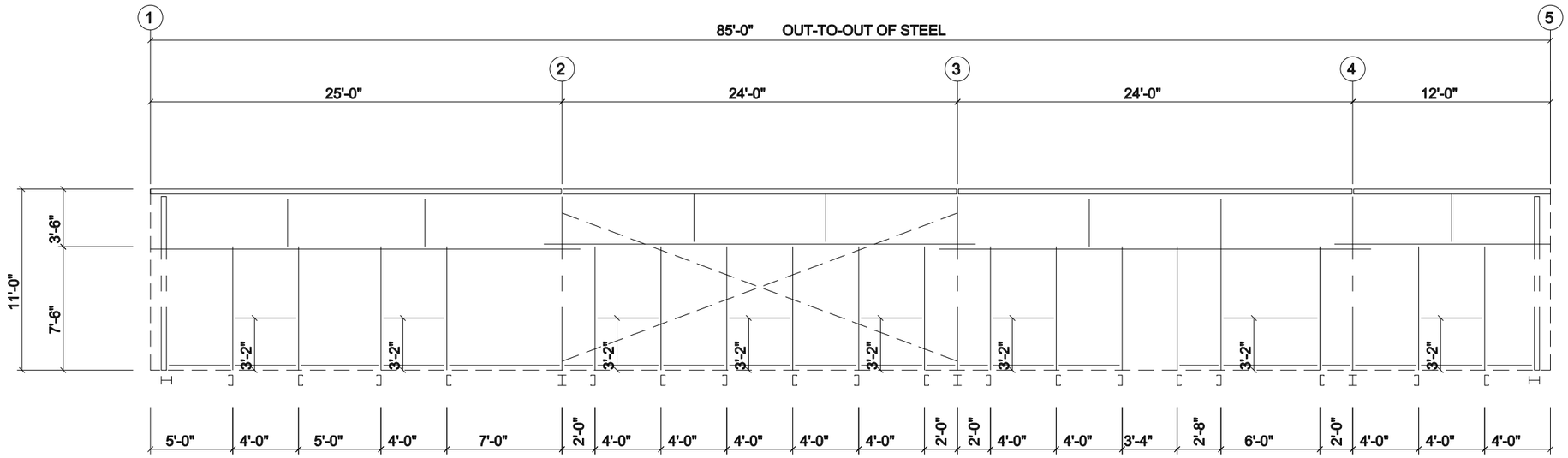
- Preliminary drawings for sales and estimating purposes only.
- Subject to change during order process.

NOT FOR CONSTRUCTION

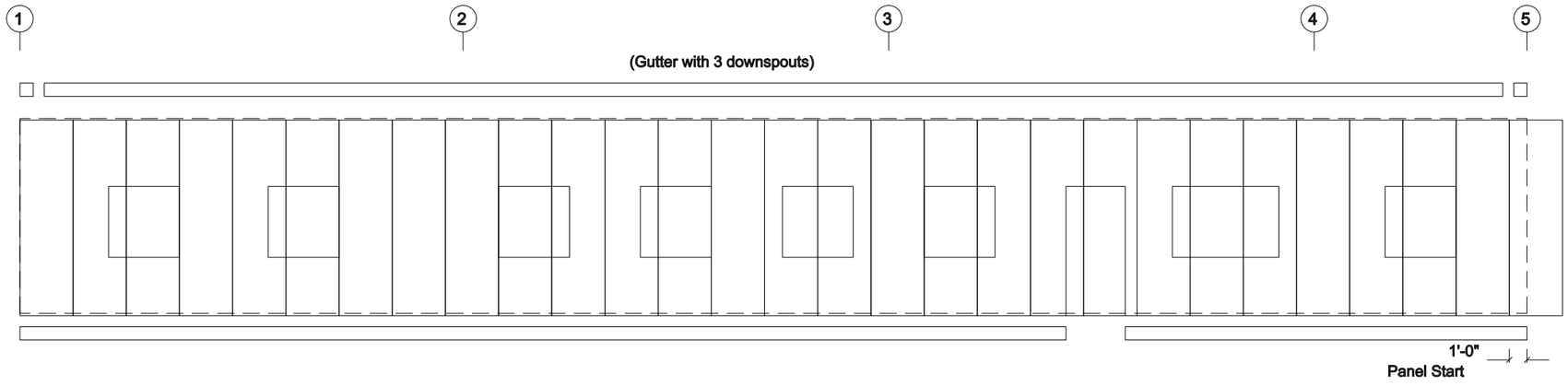
Drawing	ROOF SHEETING
Buyer	Mountain West Constructors, LLC
Customer	Connell Resources Wellington, CO 80549
Project Name	Connell Office - Wellington Batch Plant

DATE DRAWN	QUOTE NO.
11/ 1/22	Fd85201A

CHIEF BUILDINGS



SIDEWALL FRAMING: FRAME LINE D



SIDEWALL SHEETING & TRIM: FRAME LINE D

PANELS: 26 Ga. AP - Std.PVDF-FEVE Finish

GIRT DEPTH: 8.00

PRELIMINARY

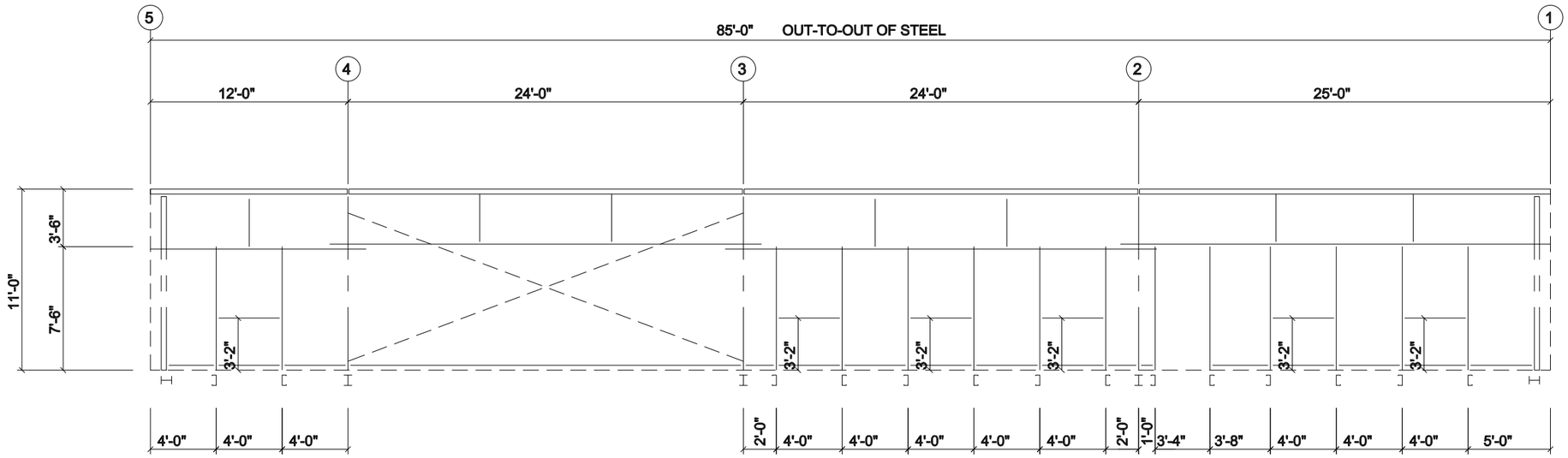
- Preliminary drawings for sales and estimating purposes only.
- Subject to change during order process.

NOT FOR CONSTRUCTION

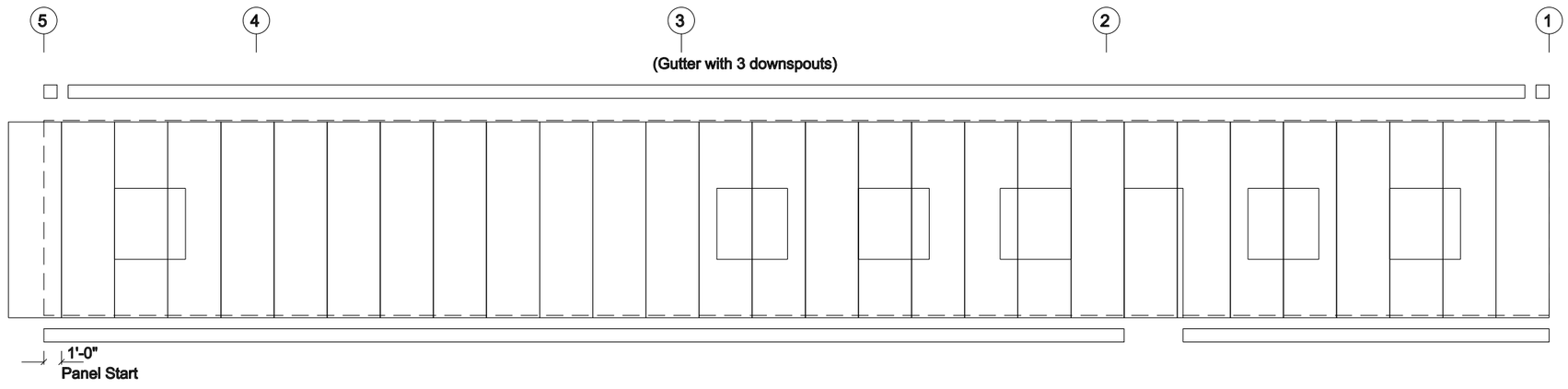
Drawing	SIDEWALL DRAWING
Buyer	Mountain West Constructors, LLC
Customer	Connell Resources Wellington, CO 80549
Project Name	Connell Office - Wellington Batch Plant

CHIEF BUILDINGS

DATE DRAWN	QUOTE NO.
11/ 1/22	FJ85201A



SIDEWALL FRAMING: FRAME LINE A



SIDEWALL SHEETING & TRIM: FRAME LINE A

PANELS: 26 Ga. AP - Std.PVDF-FEVE Finish

GIRT DEPTH: 8.00

PRELIMINARY

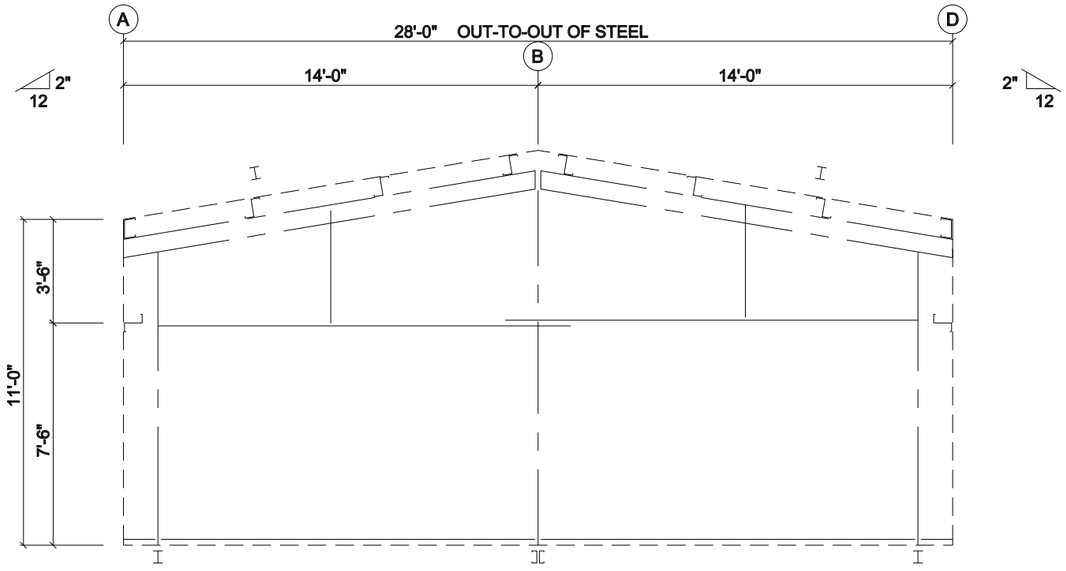
- Preliminary drawings for sales and estimating purposes only.
- Subject to change during order process.

NOT FOR CONSTRUCTION

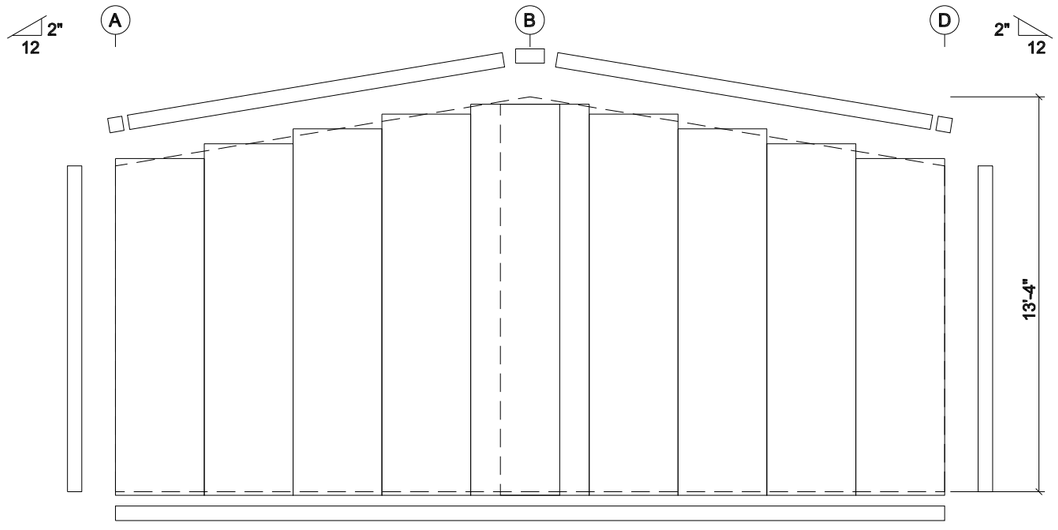
Drawing	SIDEWALL DRAWING
Buyer	Mountain West Constructors, LLC
Customer	Connell Resources Wellington, CO 80549
Project Name	Connell Office - Wellington Batch Plant

CHIEF BUILDINGS

DATE DRAWN	QUOTE NO.
11/ 1/22	FJ85201A



ENDWALL FRAMING: FRAME LINE 1



ENDWALL SHEETING & TRIM: FRAME LINE 1

PANELS: 26 Ga. AP - Std.PVDF-FEVE Finish

GIRT DEPTH: 8.00

PRELIMINARY

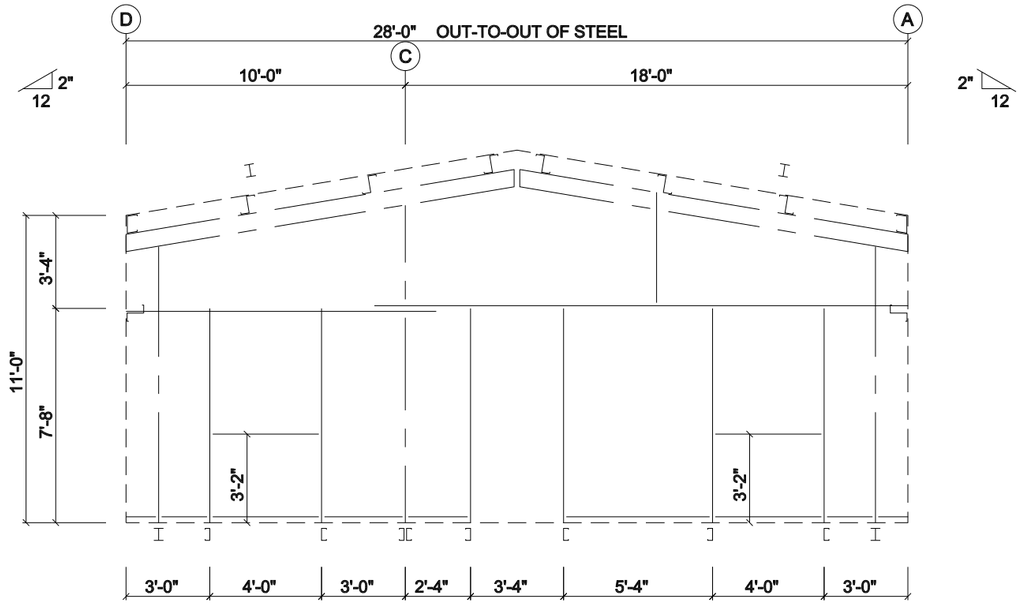
- Preliminary drawings for sales and estimating purposes only.
- Subject to change during order process.

NOT FOR CONSTRUCTION

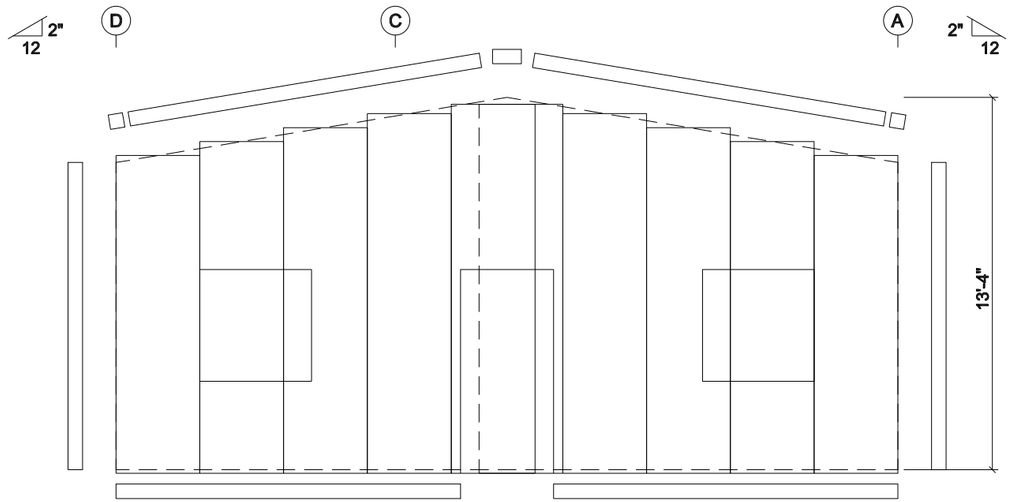
Drawing	ENDWALL DRAWING
Buyer	Mountain West Constructors, LLC
Customer	Connell Resources Wellington, CO 80549
Project Name	Connell Office - Wellington Batch Plant

CHIEF BUILDINGS

DATE DRAWN	QUOTE NO.
11/ 1/22	FJ85201A



ENDWALL FRAMING: FRAME LINE 5



ENDWALL SHEETING & TRIM: FRAME LINE 5

PANELS: 26 Ga. AP - Std.PVDF-FEVE Finish

GIRT DEPTH: 8.00

PRELIMINARY

- Preliminary drawings for sales and estimating purposes only.
- Subject to change during order process.

NOT FOR CONSTRUCTION

Drawing	ENDWALL DRAWING
Buyer	Mountain West Constructors, LLC
Customer	Connell Resources Wellington, CO 80549
Project Name	Connell Office - Wellington Batch Plant

CHIEF BUILDINGS

DATE DRAWN	QUOTE NO.
11/ 1/22	Fd852014

Brownstein

Brownstein Hyatt Farber Schreck, LLP
303.223.1100 main
410 Seventeenth Street, Suite 2200
Denver, Colorado 80202

Carolynne C. White
Attorney at Law
303.223.1197 direct
cwhite@bhfs.com

Memorandum

DATE: May 26, 2023

TO: Town of Wellington Planning Commission

FROM: Carolynne C. White

RE: Connell Resources – Site Plan Approval for the Wellington Asphalt Plant – Answers to Planning Commission Questions

Connell Resources, Inc. ("**Connell**" and/or the "**Applicant**") is requesting approval of its site plan for an asphalt mixing plant (the "**Proposed Use**") in the town of Wellington (the "**Town**"), county of Larimer (the "**County**"), state of Colorado (the "**State**") located along County Road 66 ("**CR 66**") on the north, the North Poudre Irrigation ditch along the west, and the BNSF rail line to the east (the "**Property**"). The Property is comprised of 35.56 acres and is zoned I – Industrial ("**I District**"). The Proposed Use is a use by right in the I District. The application (the "**Application**") proposes an office building, silos/plant, welding/maintenance shop, fueling facilities and workshop (the "**Project**").

The Application was presented to the Board of Adjustment ("**BOA**") on October 27, 2022 for approval of two variances (the "**Variances**"):

1. to reduce the required building setback from 1,000 feet from a residential district to 800 feet for a Heavy Industrial land use; and
2. to allow for a height increase for the silos structure from 45 ft to up to 70 ft.

The above Variances approved by the BOA are not subject to further appeal or modification by the Planning Commission or the Town Board of Trustees.

The BOA approved the Variances with the following six conditions of approval:

1. Site Plans must be reviewed and approved by the Planning Commission;
2. The height variance (up to 70-ft) is for the silos only;

3. A 15-foot earthen berm and landscaping is required along the west side of the site;
4. There is to be no signage on the silos;
5. Require signage and operator policies to disallow engine braking ("Jake Brakes");
6. Compliance with all applicable County and State permits for operation of an Asphalt Plant

The BOA also recommended that the Town-supplied potable water be reserved for office and occupied facility use only.

The Applicant then presented its application for a site plan to this Planning Commission (the "**Commission**") on March 6, 2023 (the "**Prior Hearing**"), which was continued to allow the Applicant and County staff to provide more information pertaining to the Commission and the public's questions regarding the Application. The Applicant is providing this summary memorandum to answer the Commission's questions.

1. **The site design minimizes negative impacts by placing the highest intensity uses farthest from nearby residential areas.**

The Applicant proposes a thoughtful design that locates the highest intensity activities and facilities adjacent to the railroad, which is the farthest area on the site from the residential area. Additionally, as set forth in the letters from local residents included in your packet, the residents that reside in homes that overlook the Project and the property owners directly to the west of the Property are in support of the Project.

The asphalt mixing plant and aggregate storage areas are located on the east side of the site. The plant is proposed at the base of an existing hill along the railroad tracks. This will provide natural screening and act as a background to protect the surrounding viewshed. Additionally, landscaped berms are proposed on the north, west, and southwest sides of the batch plant to help screen the industrial operations. The south half of the site will have little to no industrial usage and will be used as storage, maintenance, and stormwater detention.

The proposed office building is located in the northwest corner of the site. The office will feature attractive architectural features such as stone wainscot and decorative landscaping. The other buildings onsite will match the architecture and will be well maintained and clean.

The proposed access roads and parking lots will be paved to reduce dust. The layout of the roads was carefully designed to promote one-way traffic in an effort to reduce backup alarms onsite.

2. **The Landscape Plan provides significant perimeter and access road buffering.**

The Town requires that a minimum of 15% of the site be landscaped. The Application proposes a minimum of 18.38% of the Property be landscaped, which primarily focuses on perimeter

buffering and an 80ft to 110ft wide perimeter landscape area that includes trees, rock mulch and native grasses.

The landscaping will include alternative "buffering" techniques to effectively reduce visual impacts to the residential development, which may include site design and layout, earth berms, perimeter, walls/fences and landscape plantings. Any proposed access road along the western property line will also be lined with landscaping, berms and live-stock style welded wire fencing to create a buffering aesthetic. The proposed berms are 10 to 15 feet tall, as required by the BOA, and will block the views of the industrial activity from surrounding properties and roadways.

3. Traffic to and from the site will be mitigated.

The traffic study prepared by Delich Associates in October 2022, as amended on March 3, 2023 (the "**Traffic Study**"), which was submitted as part of the Application, concludes that the Project will generate an average of approximately 72 truck trips in and out of the Property each day.

The Applicant is committed to mitigating impacts from truck traffic traveling to and from the Property. The application proposes to mitigate traffic by improving the current roads to include new northbound right-turn lanes on County Road 7 ("**CR 7**") and paving a portion of CR 66 from the west boundary of the Property to the intersection of CR 66 and CR 7. The road improvements also include new bike lanes, a safer crossing over BNSF (in partnership with BNSF and Larimer County) and new roadway design to improve site lines at the BNSF rail crossing.

The Applicant also proposes to adjust the truck route (CR 66 to CR 7), north to Owl Canyon, then to I-25) to ensure that the trucks will not create traffic through the downtown, high school and residential areas, as demonstrated on the Haul Route Map attached hereto as Exhibit A. Truck traffic will be reduced such that that there will be fewer total trucks on the roads of Northern Colorado. Moving the plant closer to the aggregate source will reduce total traffic compared to the current facility in Timnath at Harmony Road and I-25. With truck traffic utilizing the Owl Canyon access, trucks will not be entering the general streets of the Town.

4. Potential material spills as result of trucks traveling to, from and on the Property will be sufficiently mitigated.

Under State law, spilling of loads on State highways is already prohibited, with liability attaching to the responsible party. *See, in part*, Colo. Rev. Stat. § 42-4-1407. The Applicant is responsible for cleaning up any potential materials on both the Property and connecting roadways, and will be subject to State law penalties if a spill were to occur.

a. Spills on Property

The Proposed Use does not include any materials or chemicals, hazardous or otherwise, which could spill or create environmental contamination conditions on the property. The only possible material which could theoretically create spills is fuel, and the Applicant will have a Spill,

Prevention, Containment, and Countermeasure Plan ("**SPCC Plan**") in place to properly contain any potential spill.

The storage of fuel tanks on the Property is regulated by the Environmental Protection Agency ("**EPA**") and the Colorado Department of Labor and Employment, which requires a permit. The Applicant must undergo a rigorous application process for approval of such a permit, which includes ongoing oversight, operator training, monthly and annual compliance inspections, periodic testing, continuous corrosion protection and maintaining spill prevention equipment such as spill buckets and overfill prevention devices.

Additionally, on March 1 of each year, every asphalt production facility is required by State and federal law to report the storage of any regulated onsite chemicals. This information is sent to emergency planning organizations. Concerned citizens can obtain this public information from State and federal agencies.

Potential runoff from the site will also be adequately maintained and controlled. The onsite detention pond and outlet structure on the Property have been designed to detain water from storm events and release it at a rate that matches the existing conditions on the site. The outlet structure includes a trash rack and orifice plate that restrict the release rate of the detained water. The orifice plate on the outlet structure restricts flows so that any suspended solids have time to settle to the bottom of the pond before they are released to downstream waterways. Additionally, a slide gate has been added to the outlet structure to prevent any stormwater release from the pond. The slide gate must be manually opened during storm events to allow the water to drain from the pond.

Moreover, the site earthwork and grading is completed so that all runoff is routed to the detention pond. In the event of a spill, such spills would be maintained and controlled on the site by the engineering design grades. If a spill event were to occur directly into the pond, the restricted release rate through the orifice plate, outlet structure, and slide gate would prevent the spilled material from escaping into downstream waterways.

b. Spills on Roads

As mentioned, the Applicant is committed to taking appropriate measures to mitigate any potential material spills. Pursuant to the Colorado Department of Transportation ("**CDOT**") regulations, the Applicant is responsible for cleaning up any spills that occur on the roads outside of the Property in connection with transportation of materials to the site. Trucks traveling to and from the site are considered "commercial motor vehicles" and are thus regulated as such under the CDOT rules. Moreover, the EPA has promulgated strict rules and requirements on spills. Nonetheless, studies conclude that the trucks transporting materials to the Property are not considered hazardous materials. According to the Material Safety Data Sheets (the "**MSDS**"), which are required under the OSHA Hazard Communication Standard (Subpart 1910.1200), the composition of asphalt materials used by the Applicant include asphalt and an emulsifier known as styrene-butadiene copolymer. This material, in the event of a spill, will typically harden within

48 hours depending on how quickly it cools. According to the MSDS, it can then be safely removed and disposed of in the same manner as household trash or in the Applicant's case, the material will be recycled. The spilt material will not seep into the ground and does not present any ecological hazards.

According to the Pipeline Hazardous Materials Safety Administration ("**PHMSA**"), which regulates the storage and transportation of hazardous materials, asphalt material for hot asphalt mix transported to and from the site is not considered a hazardous material, but rather an elevated temperature material. Thus, there are no placarding requirements because the material is below 300 degrees Fahrenheit.

When a permit violation or noncompliance issue leads to enforcement proceedings, corrective action is required and fines up to $15,000 per day can be levied against liable parties.

Under both the stringent State and federal regulations, no remediation plan is required until a spill occurs. The State and federal regulations set forth legal liability and requirements in the event of a spill. Thus, although no remediation plan is required at this time, the Applicant will be required to not only adhere to the strict standards, but to comply with all remediation procedures in the unlikely event of a spill. Any potential impacts to the roadways, groundwater or adjacent properties as a result of a spill are adequately protected by both State and federal regulations.

5. **The application adequately mitigates potential impacts to wildlife.**

As set forth in more detail within the Wildlife Mitigation Plan dated April 19, 2023 (the "**Wildlife Mitigation Plan**"), attached hereto as Exhibit B, there is limited wildlife located on the Property and therefore no wildlife mitigation strategies are warranted. The Wildlife Mitigation Plan concludes that there are no significant impacts to existing wildlife or habitat anticipated as a result of the Project.

6. **The Proposed Use will not generate noise in excess of applicable County and State regulations.**

The Town has not adopted an ordinance governing noise that specifics maximum decimal limits for noise; however, the Project will not exceed the County noise ordinance which sets forth appropriate noise levels for different activities and applies to properties within the incorporated County. Larimer County Noise Ordinance No. 97-03 (the "**County Ordinance**") specifies maximum sound levels at 55dbA at receiving property lines.

The Applicant has completed two Baseline Community Noise Assessments, performed and prepared by Antea Group ("**Antea**"), for both the new site in Wellington and another for the existing facility in Timnath (collectively, the "**Noise Assessments**"), attached hereto as Exhibit C, which demonstrate that noise levels generated by the facilities at both locations are well below the maximums specified by the County Ordinance. The Noise Assessments included on-site

measurement and mapping of sound levels at various locations throughout each property, along adjacent roadways, and around the entire perimeter of the properties.

Results from the Noise Assessments demonstrate that at the existing asphalt mixing facility in Timnath, recorded noise levels are 45-dbA to 50-dbA at 750 feet east of the asphalt production operation, which is well within compliance.

As set forth in the Noise Assessments, at 800 feet from the new facility in Wellington, noise levels generated by operation of the facility are expected to be below 45-dbA, which is well within the County Ordinance. However, results for the new facility in Wellington recorded current background noise levels at the site – without noise generated by the operation of the facility (because the facility has not yet been constructed) – already above the County Ordinance but still below the State's maximum noise levels of 80-dbA. Thus, the Noise Assessments conclude that these results indicate that current weather, geographical conditions, and neighboring properties near the Wellington site are contributing to higher noise levels in the area. The Noise Assessments conclude that given that background noise levels at the Wellington site are already above the County Ordinance, the Project will not be the cause of the current exceedance of the County Ordinance. The Noise Assessments also states that, "given the sound profile previously collected from the [Timnath] site, and the planned erection of dirt berms for noise attenuation, Connell Resources have properly planned to provide effective noise controls at their proposed Wellington location."

Attached hereto as Exhibit D is a decibel level comparison chart prepared by Yale University, which shows that the noise levels from the asphalt plant facility, when heard 750 feet from the facility, are at levels as low as a household refrigerator. Accordingly, this data indicates that hot asphalt mix plants are not significant generators of noise.

Moreover, the Applicant's site plan incorporates sound mitigation measures through berming and selective layout in order to absorb and direct noise away from adjacent properties. The Applicant has also committed to implementing mitigation measures to reduce noise, including restricting the use of engine brakes (Jake Brakes) for eastbound and westbound trucks on County Road 66 ("**CR 66**"). Signs will be posted in both directions of CR 66 to warn drivers of this restriction. The Applicant will also install white noise back up alarms on equipment being used at the asphalt facility in lieu of a manufactured back-up alarm that exude a loud beeping noise.

7. **The Applicant is required to obtain various State permits which shall ensure that the Applicant complies with all State environmental regulations.**

During the Prior Hearing, this Commission expressed concern regarding various environmental issues, and how the Town could be certain the Proposed Use would operate in compliance with various environmental regulations. Although BOA has already imposed a condition of approval requiring that all County and State permits be obtained and complied with, the County and State oversee and monitor the Applicant's operations which includes periodic inspection and testing.

The Applicant noted at the Prior hearing that the Proposed Use is subject to several permits in addition to the site plan and other approvals required by the Town. To help the Commission understand the scope and depth of the State's oversight of the Proposed Use, the Applicant has compiled a list of the environmental permits that the Applicant must obtain from various governmental organizations, which are set forth on Exhibit E. Asphaltic plant operations are licensed and monitored by the State for air pollutants, odor and dust particulates. The State has promulgated rules and standards to determine the safety of the operation of an asphalt plant and ensure that Applicant remains in ongoing compliance with such regulations. The State also requires regular inspection and monitoring to ensure compliance. Penalties for noncompliance with such regulations are also set forth on Exhibit E attached hereto.

As the Commission can see, the State engages in thorough oversight of projects like the Proposed Use, with the benefit of a set of detailed governing regulations, trained staff, and State funding.

8. **The Applicant has remained compliant with air quality standards, and the CDPHE Compliance Advisory from 2021 was due to a mechanical error and not noncompliance air quality standards.**

The Colorado Department of Public Health and Environment ("**CDPHE**"), which oversees and controls emissions of harmful pollutants, requires that hot mix asphalt plants test for emissions of air pollutants to demonstrate compliance with air standards. On June 25, 2021, the Applicant was performing an unobserved compliance stack test at its current facility. During the early stages of the test, the Applicant realized that an auger in the facility was experiencing a mechanical malfunction and causing an inaccurate reading. The plant staff ended the test so that the auger could be repaired. The Applicant self-reported the issue to CDPHE the same day. On July 27, 2021, the Applicant received correspondence from CDPHE that stopping a test prior to completion was considered a failed test. The Applicant disagreed with CDPHE's determination and requested that CDPHE grant the Applicant an opportunity to re-test with the facility repairs complete. CDPHE granted the Applicant's request for retesting. In October of 2021, the Applicant retested with passing emissions. The Applicant and CDPHE entered into an Early Settlement Agreement, attached hereto as Exhibit F, on December 19, 2022 wherein the parties agreed that, "Entering into this settlement shall not constitute an admission of violation of the air quality laws, or the alleged facts relating thereto, nor shall any third party infer it to be such an admission in any administrative or judicial proceeding."

As such, contrary to claims made by members of the community, there was no determination by CDPHE that the Applicant was non-compliant with air quality standards and members of the community are misinterpreting the Early Settlement Agreement between CDPHE and the Applicant. The Applicant's failed test was the result of a mechanical error, and not due to any noncompliance with air quality standards.

9. **The Proposed Use will not generate significant odor or negatively impact air quality.**

Asphalt Mixing Plants are recognized by the Environmental Protection Agency and CDPHE as minor sources of air pollution. The Applicant's current facility is permitted to a maximum emission of 19.5 tons of carbon monoxide per year. As demonstrated in the chart below of Larimer County's largest or major source generators of air pollution, the Applicant's current facility does not come close to the emissions generated by Larimer County's largest emitters.

Emitter	2014 Reportable Greenhouse Gas Emissions* (Tons of CO2)	2021 Reportable Greenhouse Gas Emissions (Tons of CO2)
Colorado State University	46,500	43,820
Anheuser Busch	50,493	43,712
Larimer County Landfill	145,812	195,915
Broadcom - Fort Collins	213,562	125,324
Rawhide	2,173,850	1,738,576

[1]

Asphalt plants must adhere to strict air requirements administered and monitored by CDPHE. Stringent limits are set for a range of pollutants based on their known effects to human health and environment. Technology and control systems are available to asphalt mixing facilities to ensure compliance with the State's air quality standards. The Applicant must submit Operation and Maintenance Plans to CDPHE to obtain approval for a permit and ensure that the facility is working in the most efficient manner. Additionally, dust control plans are required to control fugitive dust from material storage and handling areas and from trucks traveling on haul roads.

Asphalt plants are required by CDPHE to install controls or take other measures to reduce harmful air emissions. These measures and controls include counter-flow mixing equipment technology, baghouse systems to control particulate emissions, enclosed or partially enclosed conveyor systems, and top-of-silo emission recovery systems. In addition, best management practices to minimize emissions during hot mix asphalt production have been established by the asphalt industry. These best management practices include guidance on facility operation and maintenance to maximize efficiency and minimize emissions. Natural gas is a common fuel for asphalt plants. Therefore, the emissions from a plant fueled by natural gas are similar to a household furnace.

The Air Pollution Control Division (the "**APCD**"), which monitors air pollution for the State, has an enforcement staff that conducts routine inspections of asphalt plants to ensure that plant operators are properly maintaining the required air pollution equipment, keeping records, and complying with all conditions of the air permit. Most asphalt plants are inspected every 3 to 5 years, while others are inspected annually. The APCD also responds to citizen complaints on dust, odor, or noise problems at HMA plants. When a permit violation or noncompliance issue leads

[1] *See Jacy Marmaduke, Meet Larimer County's 5 Biggest Polluters,* THE COLORADAN, *https://www.coloradoan.com/story/news/2016/07/14/meet-larimer-countys-5-biggest-polluters/86818052/* (July 15, 2016).

to enforcement proceedings, corrective action is required and fines up to $15,000 per day can be levied against plants

Asphalt plants are also required to comply with federal requirements called New Source Performance Standards ("**NSPS**") provided in Colorado Regulation No. 6, Part A, Subpart I, Standards of Performance for Hot Mix Asphalt Facilities. The NSPS limits the allowable particulate emissions from an asphalt plant. To show that the asphalt plant can meet the NSPS air emission limits, the owner/operator must conduct a performance test for particulates, opacity, and sometimes CO emissions. Generally, the test is conducted within six months after the asphalt plant receives an initial approval to construct the plant.

Operators of hot mix asphalt plants are also required to submit an Air Pollution Emission Notice ("**APEN**") to the Air Pollution Control Division if air emissions exceed the reporting thresholds. Once submitted, the APEN is valid for five years. The APEN includes information on the location and ownership of the site and detailed information on the site-specific process equipment and air pollution control measures. The APCD uses the information provided on the APEN to write an air permit for the plant if it is needed.

The Proposed Use emits minimal odor. However, the Applicant conducts regular self-testing to monitor any odor and adheres to the County's standards on odor. The Applicant uses the same testing procedure as the County employs, and three of the Applicant's employees are trained to perform such testing. Pursuant to County regulations, odor nuisance is a complaint process.

10. The Applicant prepared a stormwater and drainage plan that meets the State's requirements.

Stormwater discharge is regulated by the CDPHE Water Quality Control Division and the Applicant must meet State requirements for water quality to operate the asphalt plant. The Applicant is required to obtain a Stormwater Discharge Permit from the Water Quality Control Division and the Colorado Department of Public Health and Environment. In connection with the Stormwater Discharge Permit, the Applicant must prepare a Stormwater Management Plan that must include: identification of potential sources of pollution and selection of best management practices that will be implemented to control the potential pollutants. Additionally, to maintain the Stormwater Drainage Permit, the Applicant must perform routine inspections and prepare an annual report to address compliance with the stormwater management plan.

The application proposes to construct a detention pond in the southwest corner of the parcel to drain off-site. This detention pond will regulate water quality, as well as maintaining flows offsite at no greater than the historic flow rate and quantity, as required by Colorado law.

No wetlands are located on the Property, nor does the Project propose to include a truck wash on site.

As previously mentioned, the site has been designed to capture stormwater flows in the detention pond in the southwest corner of the site. The "Rational Method" was applied to the site to size the pond and outlet structure. The Rational Method is applied by calculating existing stormwater flows on the property using area rainfall data, soil composition, impervious area, and slopes. The site is then analyzed using the proposed impervious areas and slopes. The historic and proposed stormwater flows are then compared, and the pond and outlet structure sized to properly detain and release the stormwater at historic rates.

Stormwater management and developed drainage is restricted to match existing conditions on the site. Additionally, the design must incorporate water quality control measures. The Town drainage criteria requires that the proposed drainage match the existing 10-year (minor) and 100-year (major) storm events. This means that the pond and outlet structure have been designed to detain water from storm events and release it at a rate that matches the existing conditions on the site. This protects downstream facilities from flooding due to the increased impervious area at a newly developed site. Additionally, the outlet structure includes a trash rack and orifice plate that restrict the release of the detained water. This is known as the "water quality capture volume" and is a widely accepted engineering practice. The orifice plate on the outlet structure restricts flows so that any suspended solids have time to settle to the bottom of the pond before they are released to downstream waterways.

The proposed outlet structure also includes a unique design feature that can provide further water quality measures. A slide gate has been added to the proposed outlet pipe that will remain closed during normal operation. During a stormwater event, the slide gate will be opened to allow the pond to drain. In the unlikely event of a spill, the Applicant has the ability to leave the slide gate closed and prevent any stormwater discharge while the spill is mitigated.

The proposed pond outlets to a North Poudre Irrigation Company ("**NPIC**") canal on the west boundary of the proposed site. The Applicant has reviewed the proposed design with NPIC to verify that it is an acceptable design and that the proposed site improvements will not negatively impact the canal.

11. The Applicant prepared a Groundwater Monitoring Plan to install groundwater monitoring wells and monitor water quality.

Water quality is also regulated by CDPHE, which oversees compliance, permitting, reporting, stormwater management. The Clean Water Enforcement Unit of CDPHE is tasked with ensuring compliance with water quality standards.

Although it is extremely unlikely that the Project will pose a risk to groundwater, the Applicant has voluntarily prepared a groundwater monitoring plan (the "**Groundwater Monitoring Plan**"), attached hereto as Exhibit G, which proposes to install two groundwater monitoring wells on the site. Additionally, as part of the Groundwater Monitoring Plan, the Applicant will retain an environmental consultant to assist in identifying the best on-site placement of the monitoring wells, registering the monitoring wells with the State Engineering Office and testing periodic

samples of the groundwater for analysis of water quality. Final design features will be coordinated with NPIC through an administrative process.

12. The Project will remain compliant with State and federal air quality standards.

At the request of this Commission, the Applicant retained a consultant, Antea, to conduct and complete a refined air modeling report dated May 19, 2023 (the "**Report**") to assess emissions for the Project.

The Report modeled the following pollutants: Particulate Matter, Nitrogen Oxide, Sulfur Dioxide, Carbon Monoxide, Acetaldehyde, Hexane, Formaldehyde, Toluene, Quinone, Benzene, Ethylbenzene, Xylene, Total PAH.

The Report demonstrates that the Applicant will meet all State and federal air quality standards at a maximum production level (i.e. worst case scenario). Furthermore, the Applicant voluntarily requested that the study perform air quality modeling at Eyestone Elementary School and Wellington Community Park as residents raised questions regarding the mixing plant's effect on air quality at these locations. The modeling results at these three locations demonstrate that none of the seventeen (17) pollutants modeled reach acute or chronic levels based on risk-based screening levels developed by the EPA, CalEPA, NIOSHA, Or ASTDR.

Additionally, Stephen G. Zemba, PhD, PE[2], Project Director of Sanborn, Head & Associates ("**Sanborn**") prepared a health risk assessment evaluation ("**HRAE**") of potential air quality impacts associated with emissions from the hot-mix asphalt plant, which is attached hereto as Exhibit I. The HRAE reviewed the Report and evaluated the incremental risks of cancer and other non-cancer health effects. Sanborn concluded that (1) emissions from the hot-mix asphalt plant will not present significant risks to human health, and (2) the highest incremental modeled concentrations will be small compared to existing background levels from other sources. Sanborn thus found that any increase in the risk of exposure to cancer-causing chemicals and various other chemicals is far below that which is deemed safe exposure by the Environmental Protection Agency.

13. Asphalt is a non-hazardous material and the Proposed Use may be safely operated.

Comments from the public during the Prior Hearing expressed concern that, according to the Occupational Safety and Health Administration ("**OSHA**"), asphalt causes cancer. This is incorrect; the National Asphalt Pavement Association ("**NAPA**") opines the opposite. While OSHA's website does identify certain potential health impacts associated with 'occupational' exposure to asphaltic material, including, as OSHA indicates, 'skin cancer', this potential effect is most likely associated with sun exposure during outdoor construction work and was only identified in one

[2] Stephen G. Zemba's resume, which describes his qualifications, expertise and experience, is attached hereto as Exhibit I. Stephen G. Zemba's powerpoint presentation, which summarizes the HRAE is also attached hereto as Exhibit I.

of twenty such scientific epidemiologic studies. Additionally, OSHA classifies asphalt as "non-hazardous." One reason members of the pubic could be confused is that the term 'asphalt' is not equivalent in every sense. For example, roofing asphalt has a much different composition and storage/application temperature compared to paving asphalt, and a logically different hazard potential.

The safety of asphalt and asphalt mix plant emissions is supported by the Agency for Toxic Substances and Disease Registry ("**ATSDR**"), which is the federal agency tasked with protecting communities from harmful health effects related to exposure to natural and man-made hazardous substances. Between 1998 and 2004, ATSDR conducted a series of investigations to determine potential health impacts of asphalt emissions on surrounding communities. Seven mix plant locations across the country were examined and ATSDR concluded "in communities surrounding asphalt facilities. . . there do not appear to be any chemicals or compounds at levels that would pose a public health hazard."

Lastly, as NAPA opines, neither USEPA's nor OSHA's hazard classification scheme defines or identifies asphalt or asphalt pavement mixture as 'hazardous'. This is supported by credible peer-reviewed research and governmental studies, including a letter from NAPA and an ATSDR study, that conclude that the asphalt pavement production process does not pose a health hazard to surrounding communities and that asphalt itself is considered non-hazardous. No credible evidence exists in the record to the contrary. The NAPA letter and the ATSDR studies are attached hereto as Exhibit H.

In regard to the pipeline operated by Sinclair Oil Corporation ("**Sinclair**") that runs from Wyoming to Commerce City and crosses under the subject property, Sinclair will have to approve the Applicant's site plan pursuant to the encroachment agreement. The Applicant has been consulting and working with Sinclair to ensure all appropriate safety measures are taken to protect the pipeline both during and after construction. Sinclair will not allow structures to be built over its easement over the Property, but has agreed to allow the Applicant to pave a portion of the area. Sinclair has provided the Applicant initial approval of the Project, and the Applicant will provide the Town with Sinclair's formal approval once it has been executed by the parties.

14. The application complies with the Industrial zoning of the property.

The Property has been zoned Industrial for over 22 years and the Proposed Use is one that the Town has long envisioned, as evidenced by the Property's zoning and that the Proposed Use is a use by right.

15. The application promotes the health, safety and general welfare of the Town.

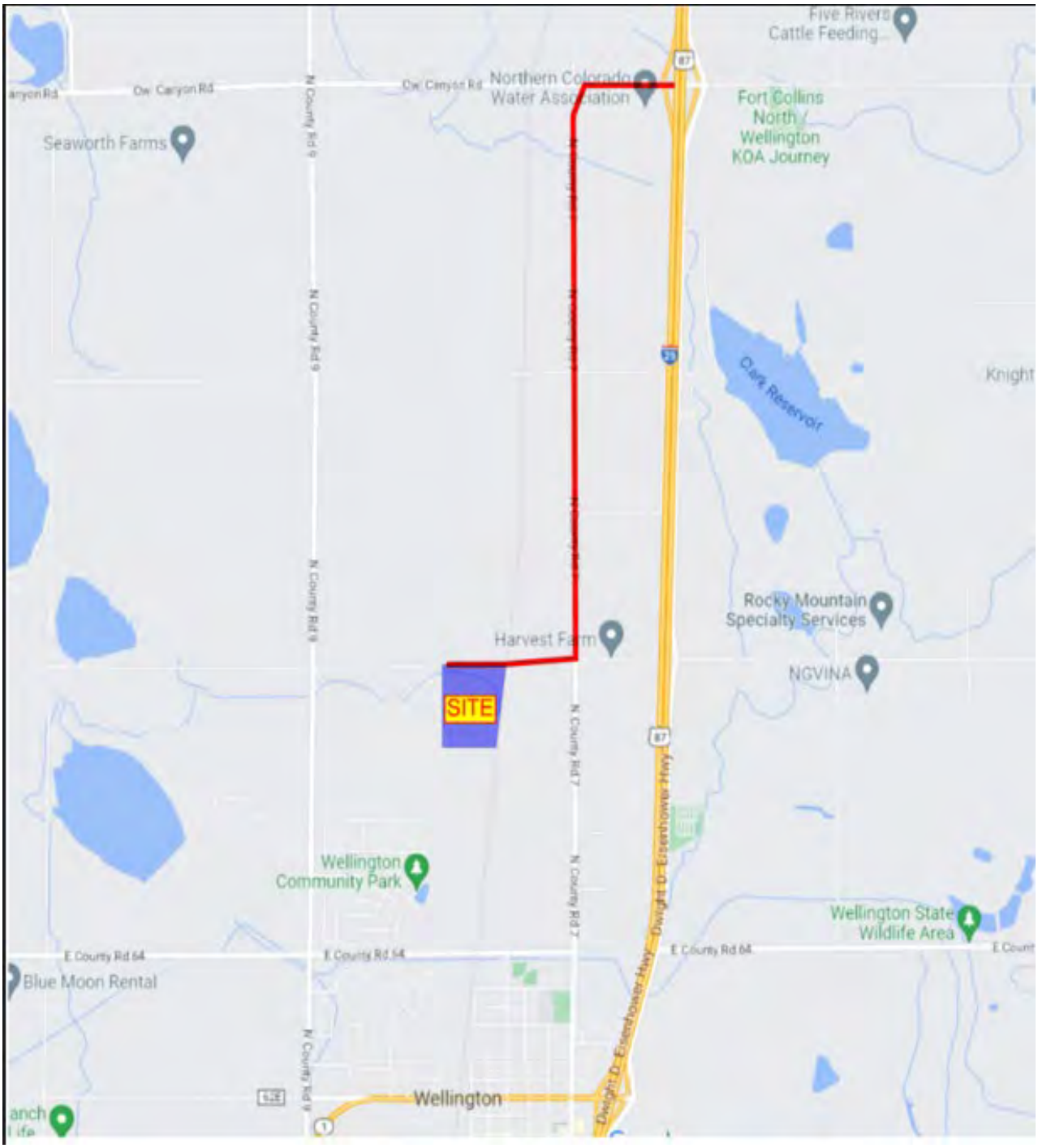
The purpose of the Town's Land Use Code (the "**Code**") includes, among others, the promotion of the health, safety, values and general welfare of the Town and the establishment of a variety of zoning district classifications with varying intensities of uses and standards. *Code, § 1.01.1.* The application complies with Section 1.01.1 of the Code by generating economic and employment

opportunities for the Town and increasing sales and property tax generation. Additionally, as the only land zoned Industrial within the Town, the Project provides for a new and varying use that does not currently exist within the Town. When the Town zoned the Property as Industrial, it determined the Property suitable for industrial operations, which includes a hot asphalt mix plant. In the last two years, the Property has undergone two public reviews and Town approvals – one in an update to the Town's Comprehensive Plan in 2021 and two in the update of the Code in 2022 – in connection with its Industrial zoning designation. Thus, the Town has already decided that the industrial uses permitted by right in the Industrial, including a hot asphalt mix plant, are safe for this Property and comply with Section 1.01.1 of the Code.

Connell has also, at the request of this Commission and as discussed throughout this memorandum, performed numerous studies and investigations to demonstrate that the Project will not have any unanticipated or negative impacts on the community.

Exhibit A

Haul Truck Route



25698270.1

Exhibit B

Wildlife Mitigation Plan

[see attached]

Technical Memo

PO Box 272150,

Fort Collins, CO 80527

(970) 988-3106

To: Larimer County Planning Department

From: Cedar Creek Associates, Inc.

Date: April 19, 2023

Subject: Connell LLC – Preliminary Wildlife Mitigation Plan

Cedar Creek Associates, Inc. (Cedar Creek) was contracted by Connell LLC to conduct an evaluation of wildlife features on a target property located on E County Road 64 in Wellington, Colorado. The project area comprises approximately 30.6 acres within parcel #8928000019. The site is primarily agricultural fields and a laydown yard for storing equipment. The proposed development site was assessed on April 12, 2023, to identify habitats and potential wildlife impacts to development.

Wildlife Habitat

Due to the current land uses on the property, there is limited wildlife habitat located on the property. Figure 1 shows that the majority of the site is actively farmed with a small portion on the northeast side open range. Farmed land over limited wildlife habitat value due to the homogenous landscape and anthropogenic activity. The southwest corner of the parcel is used for equipment storage. Within the vicinity of the target parcel, there are several large trees associated with residential areas to the east and northwest. These trees were surveyed for raptor nests, but no nests were found.

The Colorado Parks and Wildlife (CPW) Threatened and Endangered Species List and High Priority Habitat database (SB181) were queried for potential habitat on and in the vicinity of the project area. Potential habitat for threatened and endangered species is not present on or near the project area. The High Priority Habitat database revealed Aquatic Native Species

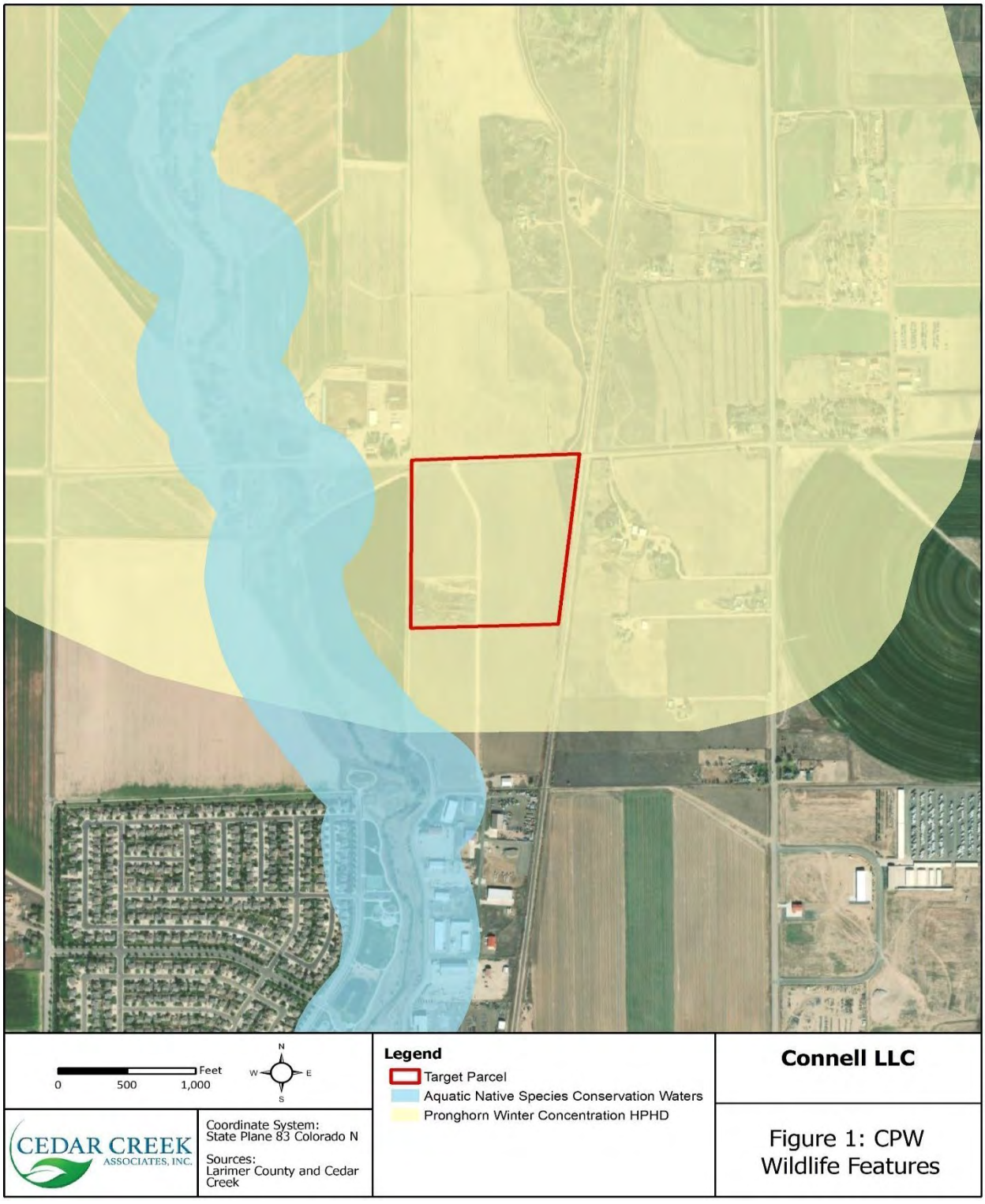
Conservation Waters associated with Boxelder Creek to the west of the project (Figure 1). However, the project area falls outside the buffer for that feature. The High Priority database also indicated Pronghorn Winter Concentration area which overlaps the project area (Figure 1). While there is the potential for valuable pronghorn habitat, the current land uses limit its habitat value.

Mitigation

Based on the limited habitat value on and near the project site, no wildlife mitigation strategies are warranted on this property. There are not anticipated to be any significant impacts to existing wildlife or habitat.

References

Colorado Parks and Wildlife (CPW). 2022. Colorado Parks and Wildlife High Priority Habitat Mapping. Publicly Available Data. December 5, 2022


0
500
1,000
Feet
N
W
E
S
Legend
Target Parcel
Aquatic Native Species Conservation Waters
Pronghorn Winter Concentration HPHD
Connell LLC
CEDAR CREEK ASSOCIATES, INC.
Coordinate System:
State Plane 83 Colorado N
Sources:
Larimer County and Cedar Creek
Figure 1: CPW Wildlife Features

Project Name: Connell	**Location:** Larimer County, Colorado	
Description: Agricultural fields		

Project Name: Connell	**Location:** Larimer County, Colorado	
Description: Agricultural fields		
Project Name: Connell	**Location:** Larimer County, Colorado	

Description: Laydown yard storing equipment		
Project Name: Connell	**Location:** Larimer County, Colorado	
Description: Trees surveyed for raptor nests		

Exhibit C

Predictive Sound Modeling & Noise Contour Map

[see attached]

Community Noise Assessment

Connell Resources Inc
Ft. Collins, Colorado
Assessment Date: April 7, 2023
Report Date: April 28, 2023

Antea®Group

Understanding today.
Improving tomorrow.

PREPARED FOR
Connell Resources Inc
7785 Highland Meadows Pkwy #100,
Windsor, CO

PREPARED BY
Antea Group

April 28, 2023

Project # 2023-01-501742

us.anteagroup.com

The logo and ANTEA are registration trademarks of Antea USA, Inc.

Contents

1.0 Executive Summary 1
1.1 Recommendations 1
2.0 Introduction 1
2.1 Description of Operations 2
2.2 Standards and Guidelines 2
3.0 Summary of Results 3
3.1 Sound Level Survey 3
4.0 Recommendations 1
5.0 Discussion 1
6.0 Remarks 2

Tables

Table 1 - Regulatory Noise Ordinance Sound Thresholds
Table 2 - Inverse Square Law Calculations

Appendices

Appendix A - Sound Level Mapping
Appendix B - Sound Level Meter Data
Appendix C – Calibration Certificates

Noise Assessment

Connell Resources Inc.
Fort Collins, CO

1.0 EXECUTIVE SUMMARY

Antea®Group, at the request of Connell Resources, completed a Community Noise Assessment of its Fort Collins, CO Site. The Community Noise Assessment was performed on April 7, 2023. Local on-site guidance was provided by Brandon Martin of Connell Resources. The Community Noise Assessment included on-site measurement and mapping of noise sources in various locations throughout the facility, along adjacent roadways, and at various perimeter distances from the asphalt plant.

Antea Group collected instantaneous sound levels using a hand-held sound level meter (SLM) to record the equivalent sound level, or sound pressure level in dB(A)(Lavg) in various locations within the property lines of the Connell Resources facility. Each sound level measurement was plotted in the Survey123 app, by ArcGIS. The app was used to create a sound map based on the collected GPS location and sound level data. These measurements were compared to the state of Colorado and Larimer County noise ordinances. Sound level maps are provided in **Appendix A** and raw data including specific GPS coordinates is included in **Appendix B.**

Results of the Community Noise Assessment indicate that, while not applicable to Connell Resources as an Industrial operation, the Connell Resources Inc. asphalt plant in Fort Collins, CO did not exceed the applicable state of Colorado noise ordinance of 80 db(A).

The asphalt plant appears to be well controlled, and, with installation of the planned berm, which exceeds the height of the current berm. Noise levels are expected to be attenuated to below 55db outside of the berm at the new Wellington site if the site has similar sound characteristics as the Fort Collins site.

1.1 RECOMMENDATIONS

- Construct dirt berms along the perimeter of the new site at a sufficient height to adequately contain noise sources within the property lines as a best management practice.
- Monitor background noise at the new Wellington site before and after construction of the new plant to establish a baseline and an adjusted community noise assessment after plant operation to ensure continued compliance with the Larimer County and State of Colorado noise ordinances.
- Establish communications with the Town of Wellington Police Department and county to clarify what constitutes a prima facie determination of unreasonable noise.

2.0 INTRODUCTION

Antea Group conducted on-site sampling at the Connell Resources facility in Fort Collins, Colorado on April 7, 2023. The purpose of the study was to evaluate the environmental noise levels generated by the asphalt plant and review the measurements to the local state and county community noise ordinance. The scope of work involved using a hand-held type 1 sound level meter to measure sound levels around the plant, along the entire perimeter of the property, and at select locations across a county road for noise mapping. The purpose of this assessment was to collect data of current sound level measurements at the Fort Collins site as baseline which may provide an approximation of anticipated sound levels at the future Wellington site. Antea Group was unable

to compare sound level measurements to the Town of Wellington noise ordinance (Sec. 10-10-10. Unreasonable Noise) as the threshold is determined by members of the Police Department via a prima facie determination as to whether a noise is unreasonable.

2.1 DESCRIPTION OF OPERATIONS

The Connell Resources Fort Collins location has several different operations, serving their asphalt, grading and excavation, paving, and utility installation customers. On the day of sampling, Connell Resources was operating its asphalt plant on the north side of the property and conducting non-routine grading and other construction-related dirt work on the southeast side of the property. During asphalt production, the aggregate was collected from nearby stockpiles by an articulated loader and brought to the asphalt plant for processing. Once at the plant, the aggregate is typically processed through a series of steps that involve drying and heating, as well as mixing with the asphalt binder to create asphalt concrete. Prior to production, dump trucks are typically lined up to the west of the plant and waiting to be loaded with the finished product via the silo, which serves as a storage container until the asphalt concrete is ready to be transported to the construction site.

2.2 STANDARDS AND GUIDELINES

Sound Levels were compared to the noise level ordinances established by Larimer County (Ordinance No. 97-03) and the State of Colorado (25-12-103 - Maximum permissible noise levels). Sound level ordinances are provided below in **Table 1.** Connell Resources Inc. is classified as an Industrial facility and is located on land zoned for Industrial Land Use.

Table 1: Regulatory Noise Ordinance Sound Thresholds

Sound Type	Regulatory Body	Noise Ordinance Effective Time	Residential Source db(A)	Commercial Source db(A)	Light Industrial Source db(A)	Industrial Source db(A)	Location of measurement
Continuous Max db(A)	State of Colorado	7 am-7 pm	55	60	70	**80**	25 feet from noise source property line
		7pm-7am	50	55	65	**75**	
	Larimer County*	7 am-7 pm	55	NA	NA	NA	At or within the residential source property line
		7pm-7am	50	NA	NA	NA	
<15 minute Max db(A)	State of Colorado	7 am-7 pm	65	70	80	**90**	25 feet from noise source property line
		7pm-7am	55	60	70	**80**	
	Larimer County*	7 am-7 pm	55	NA	NA	NA	At or within the residential source property line
		7pm-7am	50	NA	NA	NA	
Impulse Max db(A)	State of Colorado	7 am-7 pm	50	55	65	**75**	25 feet from noise source property line
		7pm-7am	45	50	60	**70**	
	Larimer County*	7 am-7 pm	55	NA	NA	NA	At or within the residential source property line
		7pm-7am	50	NA	NA	NA	

* Based on the language of the Larimer County Ordinance, it appears that the ordinance applies solely to noise sources originating from residential or public, non-industrial and non-commercial sources. Section 5 suggests that only sources from residential land use are covered by the ordinance, so the columns for Commercial, Light Industrial, and Industrial Sources are exempt and marked NA (Not Applicable). Please note that Antea Group USA cannot provide legal advice, and any legal interpretations of the noise ordinances should be verified by an attorney licensed to practice in the state of Colorado.

Exemptions:

- General traffic
- Railroad noise
- Agricultural equipment
- Aircraft or other federal preemptions
- Emergency vehicles
- Sponsored athletic events
- Non-residential emitters (Larimer County)

The following appendices supplement the results of the Community Noise Assessment discussed in this report:

- Appendix A – Sound Level Mapping
- Appendix B - Sound Level Mapping Data
- Appendix C – Calibration Certificates

3.0 SUMMARY OF RESULTS

3.1 SOUND LEVEL SURVEY

A Community noise assessment was conducted on April 7, 2023 throughout the Connell Resources Asphalt Plant facility as part of the Community Noise Assessment. A sound level meter Casella CEL-633C Type I Sound Level Meter (SLM) was set to slow response, A-weighted scale, 0 db threshold, and equipped with a windscreen. The instrument was pre-calibrated on site and post-calibrated immediately after the survey and had an instrument drift of fewer than 0.1 decibels.

The SLM was used to measure instantaneous sound levels in various locations within and outside of the property lines of Connell Resources, including inside and outside the dirt berm on the east and west side of the property, along the property line shared with Interstate 25, and across the street from the east property line.

A road was located on the east property line and was a source of traffic from a large retail store to the north of the property. Sound levels were collected on either side of the road without traffic. Sound levels were then collected on the east side of the road with traffic to compare to non-traffic sound level measurements. The purpose of collecting sound levels on the east side of the road was to demonstrate the effect of road noise independent of asphalt plant noise.

Each sound level measurement was plotted in the Survey123 app, by ArcGIS. The app was used to precisely plot sound levels to locations across the site with an accuracy of 3 meters and used to create a sound map based on the collected data. 248 data points were collected across the plant, property line, and across the road to the east of the property.

Results of the sound level survey are presented in sound maps in **Appendix A**, raw data in **Appendix B**, and in a PowerBI dashboard previously provided.

A review of the sound level survey data indicated that Connell Resources Inc. does not exceed noise ordinances for either the State of Colorado or Larimer County.

4.0 RECOMMENDATIONS

Based on the results of the community noise assessment Antea Group recommends the following:

- Construct dirt berms along the perimeter of the new site at a sufficient height to adequately contain noise sources within the property lines as a best management practice.
- Monitor background noise at the new Wellington site before and after construction of the new plant to establish a baseline and an adjusted community noise assessment based on baseline noise surveys to ensure continued compliance with the State of Colorado noise ordinance.
- Establish communications with the Town of Wellington Police Department and to clarify what constitutes a prima facie determination of unreasonable noise.

5.0 DISCUSSION

- West Property Line: Sound levels were collected on either side of the dirt berm on either side of the property. On the west side of the property, Interstate 25 contributed to a majority of excessive noise and data collected inside of the berm separating the site from the interstate were lower than those collected outside of the west berm. Sound level measurements collected directly west of the plant were elevated due to idling dump trucks. The dirt berms provided excellent noise reduction from the interstate noise.
- Southeast Property Line: Sound level measurements were elevated near the construction project occurring on the southeast of the property. Heavy dirt moving equipment were present and are not a part of the Asphalt Plant operations.
- South Property Line: Traffic along the south property line were the primary contributor to elevated sound level measurements.
- East Property Line: A road was located on the east property line and was a source of traffic from a large retail store to the north of the property. Sound levels were collected on either side of the road without traffic. Sound levels were then collected on the east side of the road with traffic to compare to non-traffic sound level measurements. The purpose of collecting sound levels on the east side of the road was to demonstrate the effect of road noise independent of asphalt plant noise.
- East Berm: The east berm had areas that contributed to good sound attenuation. However, the berm on the north side of the east property line was approximately 5-6 feet tall, but as data points were collected moving south, the wall tapered down. At the closest point to the plant, the highest sound level measurement along the east property line was 55.4 db(A). Unfortunately, the berm at this location was approximately 12-18 inches tall, making it a poor attenuator of sound. If the berm were at an adequate height, Connell could achieve better attenuation and reduce noise levels to less than 55 db(A).
- Sound Pressure Theory: Sound waves follow the Inverse Square law which roughly means each doubling of distance from a noise source equates to an approximate reduction of 6 decibels. The loudest measurement at the Connell Asphalt plant was 83db(A). A calculation of noise levels at various distances is provided in **Table 2.**

Table 2: Inverse Square Law Calculations

Sound Pressure Level db(A)	Distance (ft)	Sound Pressure Level db(A)	Distance (ft)	Sound Pressure Level db(A)	Distance (ft)
83 (source)	1	55.0	150	38.6	1000
70.6	25	52.5	200		
64.6	50	46.5	400		
58.6	100	44.6	800		

6.0 REMARKS

The recommendations contained in this report represent Antea Group USA, Inc.'s professional opinions based upon the currently available information and are arrived at in accordance with currently accepted professional standards. This report is based upon a specific scope of work requested by the client. The contract between Antea Group USA, Inc. and its client outlines the scope of work, and only those tasks specifically authorized by that contract or outlined in this report were performed. This report is intended only for the use of Antea Group USA, Inc.'s client and anyone else specifically identified in writing by Antea Group USA, Inc. as a user of this report. Antea Group USA, Inc. will not and cannot be liable for unauthorized reliance by any other third party. Other than as contained in this paragraph, Antea Group USA, Inc. makes no express or implied warranty as to the contents of this report.

Antea Group appreciates the opportunity to perform this industrial hygiene evaluation at the Connell Resources Inc. Fort Collins Pit. Please contact us with any questions, or if you would like further assistance in reviewing the information presented above.

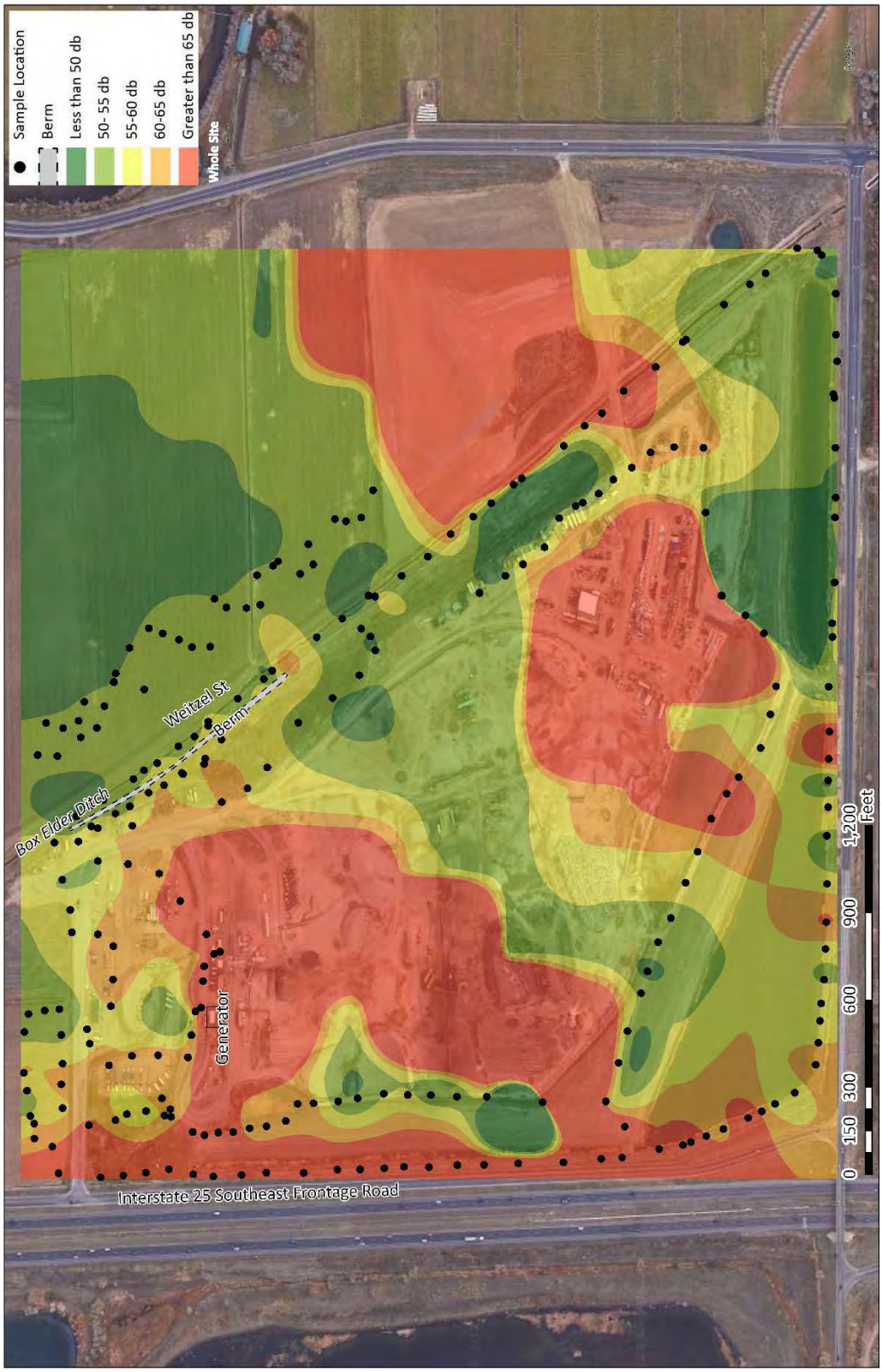
Prepared by:

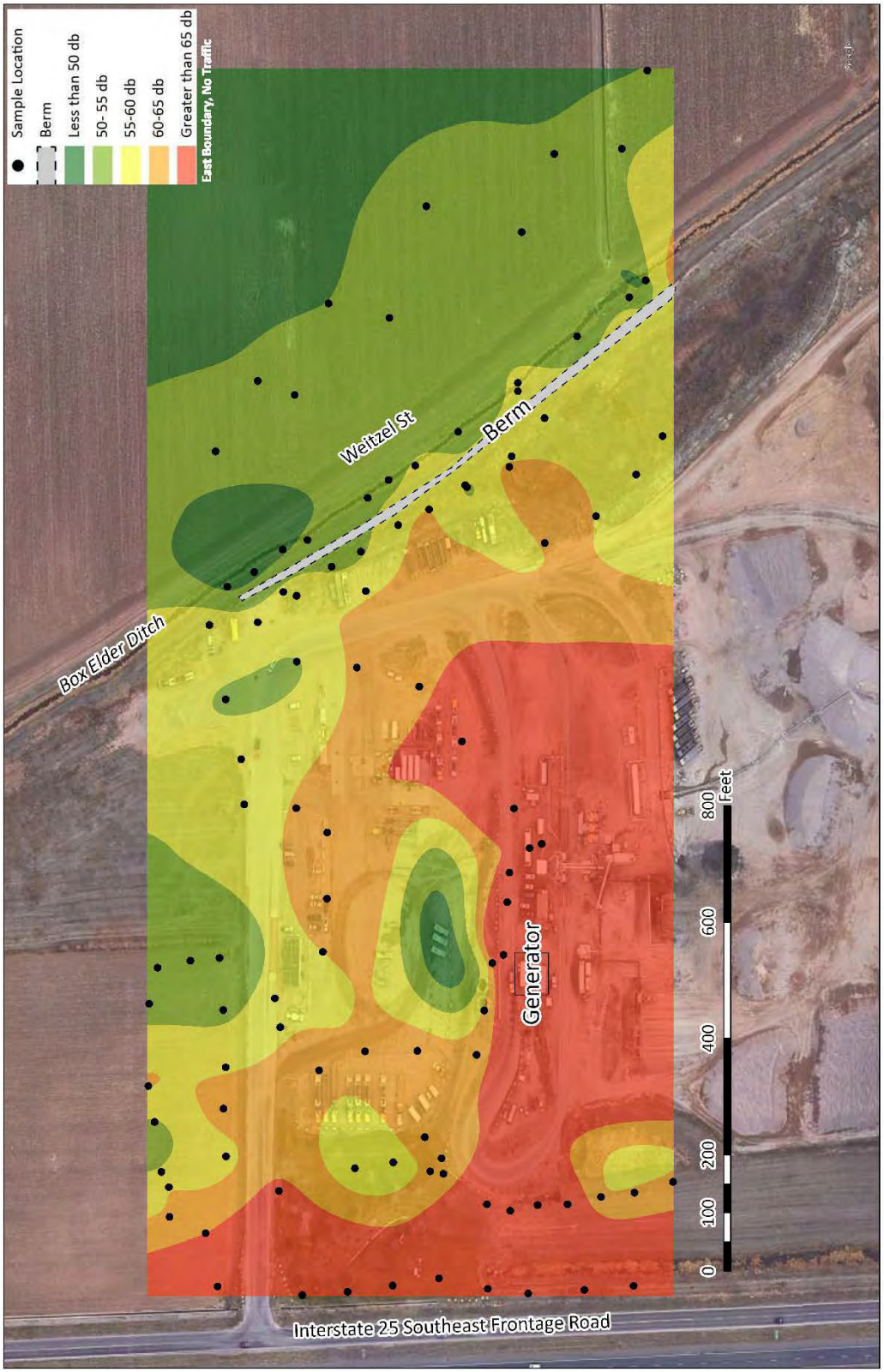
John F. Wright, MPH, CIH, CSP
Senior Professional

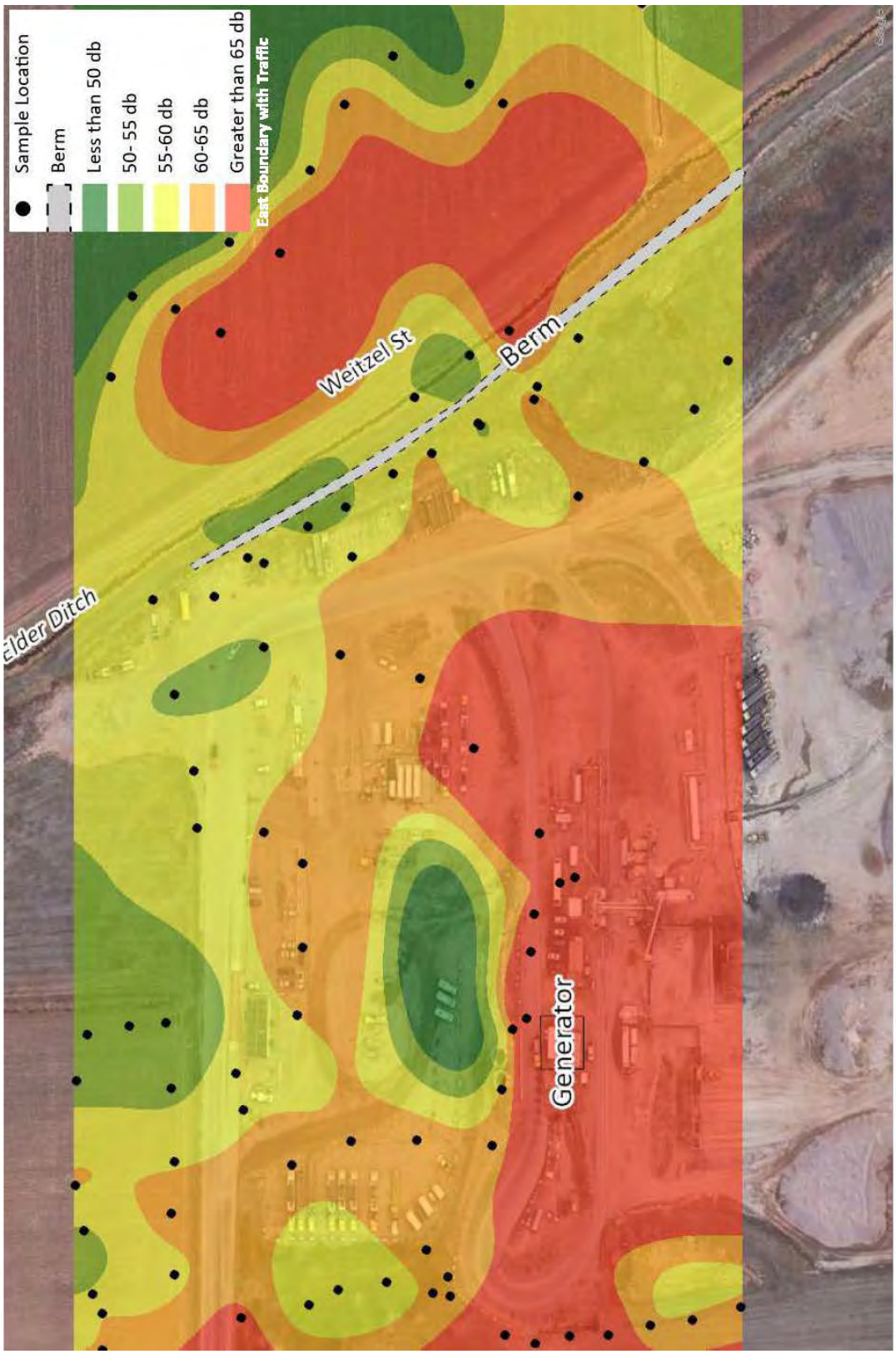
Reviewed by:

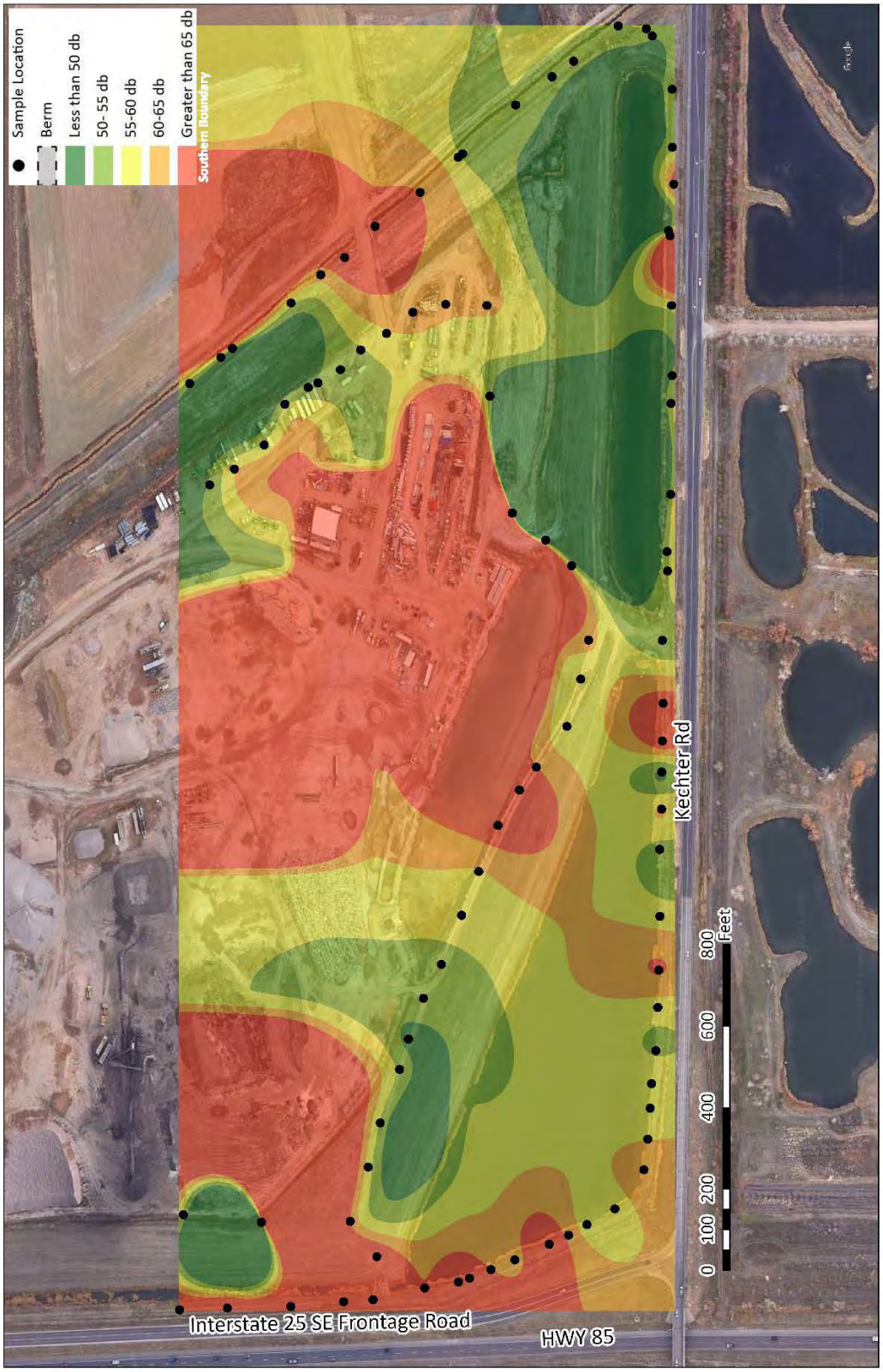
Jennene Lyda, MS, CIH, CSP
Senior Project Manager

Appendix A – Sound Level Mapping


Sample Location
Berm
Less than 50 db
50- 55 db
55-60 db
60-65 db
Greater than 65 db
Whole Site
Weitzel St
Berm
Box Elder Ditch
Generator
Interstate 25 Southeast Frontage Road
0
150
300
600
900
1,200
Feet


Sample Location
Berm
Less than 50 db
50- 55 db
55-60 db
60-65 db
Greater than 65 db
East Boundary, No Traffic
Weitzel St
Berm
Box Elder Ditch
Generator
Interstate 25 Southeast Frontage Road
0
100
200
400
600
800
Feet


Sample Location
Berm
Less than 50 db
50- 55 db
55-60 db
60-65 db
Greater than 65 db
East Boundary with Traffic
Weitzel St
Berm
Elder Ditch
Generator


Sample Location
Berm
Less than 50 db
50- 55 db
55-60 db
60-65 db
Greater than 65 db
Southern Boundary
Kechter Rd
Interstate 25 SE Frontage Road
HWY 85
0 100 200 400 600 800
Feet

25698270.1

Appendix B - Sound Level Meter Data

Object ID	Sample Location (Specific Point)	LAVG Reading	Date and Time	Coordinate x	Coordinate y
1	Generator	83	4/7/2023 4:52:00 PM	-104.9898617	40.51461539
2	Towers	79.7	4/7/2023 4:53:00 PM	-104.9891727	40.51456578
3	West plant near tower	70.2	4/7/2023 4:54:00 PM	-104.989358	40.51449222
4	West plant near tower	69.2	4/7/2023 4:56:00 PM	-104.9894741	40.51458741
5	West plant near tower	74.4	4/7/2023 4:57:00 PM	-104.9896138	40.51459765
6	West plant near tower	65	4/7/2023 4:59:00 PM	-104.9899003	40.51466766
7	West plant near tower	60.6	4/7/2023 4:59:00 PM	-104.9901232	40.51470582
8	West plant near tower	63	4/7/2023 5:01:00 PM	-104.990332	40.51474102
9	West plant near tower	60.8	4/7/2023 5:02:00 PM	-104.990819	40.51490598
10	east side of berm	60.7	4/7/2023 5:02:00 PM	-104.9908797	40.51496047
11	east side of berm	58	4/7/2023 5:03:37 PM	-104.9908376	40.51513336
12	e berm	57.6	4/7/2023 5:04:33 PM	-104.9908654	40.51531467
13	past berm near ent traffic noise	56.8	4/7/2023 5:05:00 PM	-104.9909216	40.51542267
14	entrance corner near freeway	66.3	4/7/2023 5:07:14 PM	-104.9909715	40.51567177
15	entrance corner near freeway	78.5	4/7/2023 5:09:00 PM	-104.9914223	40.51596009
16	entrance corner near freeway	65	4/7/2023 5:10:55 PM	-104.9911717	40.51601708
17	entrance corner near freeway	60.6	4/7/2023 5:11:00 PM	-104.9910947	40.51618724
18	entrance corner near freeway	59.5	4/7/2023 5:12:44 PM	-104.9909544	40.51618906
19	north side other side of north berm	55.7	4/7/2023 5:13:00 PM	-104.9908829	40.51622496
20	north side other side of north berm	54.7	4/7/2023 5:13:38 PM	-104.990647	40.51625656
21	north side other side of north berm	60	4/7/2023 5:14:00 PM	-104.9904785	40.51628705
22	north side other side of north berm	53.3	4/7/2023 5:15:00 PM	-104.9900911	40.51628225
23	north side other side of north berm	53.1	4/7/2023 5:16:00 PM	-104.9899217	40.51624341
24	north side other side of north berm	53.3	4/7/2023 5:16:00 PM	-104.9898887	40.5160883
25	north side other side of north berm	51	4/7/2023 5:17:00 PM	-104.9898759	40.51595156
26	north side other side of north berm	53.7	4/7/2023 5:17:46 PM	-104.990121	40.51593326
27	north side other side of north berm	59.3	4/7/2023 5:18:22 PM	-104.9903908	40.51592163
28	north side other side of north berm	62.2	4/7/2023 5:18:53 PM	-104.9905844	40.51593243
29	north side other side of north berm	58.7	4/7/2023 5:19:00 PM	-104.9908102	40.51592058
30	west of berm freeway	75.5	4/7/2023 5:20:00 PM	-104.9914621	40.51556183
31	west of berm freeway	78.7	4/7/2023 5:21:00 PM	-104.9914473	40.51534881
32	west of berm freeway	73.3	4/7/2023 5:22:09 PM	-104.9914176	40.51513701
33	west of berm freeway	75.4	4/7/2023 5:22:50 PM	-104.9913835	40.51491958
34	west of berm freeway	75.1	4/7/2023 5:23:00 PM	-104.9914335	40.51468958
35	west of berm freeway	74.6	4/7/2023 5:23:00 PM	-104.9914545	40.51449915
36	west of berm freeway	75.5	4/7/2023 5:24:00 PM	-104.9914382	40.5142341
37	west of berm freeway	79.2	4/7/2023 5:25:00 PM	-104.9914189	40.5140028
38	west of berm freeway	81.1	4/7/2023 5:25:00 PM	-104.9914194	40.51364949
39	west of berm freeway	72.2	4/7/2023 5:26:35 PM	-104.991387	40.5133332
40	west of berm freeway	77.6	4/7/2023 5:27:00 PM	-104.9913877	40.51311622
41	west of berm freeway	75.1	4/7/2023 5:27:42 PM	-104.991377	40.51289095
42	west of berm freeway	76.4	4/7/2023 5:28:00 PM	-104.991362	40.51270257
43	west of berm freeway	78.4	4/7/2023 5:28:00 PM	-104.9913659	40.51246798
44	west of berm freeway	77.1	4/7/2023 5:29:08 PM	-104.9913461	40.51220233
45	west of berm freeway	75.6	4/7/2023 5:29:00 PM	-104.9913429	40.51194943
46	west of berm freeway	78.8	4/7/2023 5:30:00 PM	-104.9913318	40.51162774
47	west of berm freeway	76.9	4/7/2023 5:30:00 PM	-104.9913202	40.51120147
48	west of berm freeway	79.6	4/7/2023 5:31:00 PM	-104.9912878	40.51084568
49	west of berm freeway	83.7	4/7/2023 5:32:09 PM	-104.9912756	40.51064863
50	west of berm freeway	72.6	4/7/2023 5:32:44 PM	-104.990984	40.51062306
51	mulch north of position blocking plant	65.3	4/7/2023 5:33:00 PM	-104.9907463	40.51080198
52	east of berm	53.5	4/7/2023 5:35:00 PM	-104.9907532	40.51139759
53	east of berm	52.1	4/7/2023 5:36:29 PM	-104.9907536	40.51139839
54	east of berm	53.4	4/7/2023 5:37:00 PM	-104.990703	40.51192375
55	east of berm	52.8	4/7/2023 5:37:00 PM	-104.9907014	40.5122039
56	east of berm	51.6	4/7/2023 5:38:16 PM	-104.9906883	40.51244955
57	e berm plant visible	56.1	4/7/2023 5:39:05 PM	-104.9906839	40.51266639
58	e berm behind soil pile	54.4	4/7/2023 5:39:00 PM	-104.9906739	40.51289571
59	behind soil pile	50.7		104.9907183	40.51313939
60	behind soil	51.8	4/7/2023 5:41:15 PM	-104.9907463	40.51332435

61	e berm plant visible	61.1	4/7/2023 5:42:00 PM	-104.9907647	40.51355755
62	e berm plant visible	60.7		-104.9907694	40.5137051
63	e berm plant visible	61	4/7/2023 5:43:17 PM	-104.9909294	40.51381822
64	e berm plant visible	60.7	4/7/2023 5:44:11 PM	-104.9909797	40.51399977
65	e berm near dump trucks	61.5	4/7/2023 5:44:00 PM	-104.9909999	40.51415642
66	next to dump trucks running	70.9	4/7/2023 5:45:32 PM	-104.9910345	40.51431323
67	running dump truck	71	4/7/2023 5:46:03 PM	-104.9910386	40.51445371
68	dump trucks	67.8	4/7/2023 5:47:00 PM	-104.9910653	40.51458351
69	dump trucks	72.7	4/7/2023 5:47:23 PM	-104.9910344	40.51469341
70	near dump trucks	61.6	4/7/2023 5:48:00 PM	-104.9908919	40.51489784
71	near trucks	62.7	4/7/2023 5:48:00 PM	-104.9907186	40.51498503
72	Lot between plant and scales	62.7	4/7/2023 5:49:34 PM	-104.9903126	40.51502027
73	Lot between plant and scales	60.5	4/7/2023 5:50:00 PM	-104.9903156	40.51526687
74	next to scale trailer	60.7	4/7/2023 5:51:00 PM	-104.9904048	40.51548322
75	next to scale trailer	59.3	4/7/2023 5:52:00 PM	-104.9902011	40.51566562
76	next to trailer no berm to west	57.7	4/7/2023 5:53:33 PM	-104.9900656	40.51569091
77	in front scale trailer	60	4/7/2023 5:54:19 PM	-104.9898481	40.51546491
78	in front scale trailer	63.2	4/7/2023 5:54:00 PM	-104.9895978	40.51544529
79	in front scale trailer	62.5	4/7/2023 5:55:00 PM	-104.9892848	40.51544411
80	lot next to scales	60.4	4/7/2023 5:56:02 PM	-104.9891713	40.51558953
81	lot next to scales	57.9	4/7/2023 5:56:00 PM	-104.9891532	40.51583507
82	lot next to scales	57.3	4/7/2023 5:57:00 PM	-104.9889408	40.51584929
83	fenceline	54.6	4/7/2023 5:58:00 PM	-104.9886592	40.51592208
84	next to road no berm	58.1	4/7/2023 5:59:00 PM	-104.9883089	40.51599842
85	e of berm no traffic	49.2	4/7/2023 5:59:47 PM	-104.9881294	40.51591434
86	e of berm in fenceline no traffic	48.9	4/7/2023 6:00:36 PM	-104.9880601	40.51578846
87	e of berm no traffic	49.3	4/7/2023 6:01:26 PM	-104.987954	40.51565376
88	e berm no traffic	50.8	4/7/2023 6:01:53 PM	-104.987909	40.51553707
89	e berm no traffic slight wind	52.9	4/7/2023 6:02:55 PM	-104.9877111	40.5152546
90	e berm no traffic	53.2	4/7/2023 6:03:00 PM	-104.9876266	40.51515535
91	e of berm	55.5	4/7/2023 6:04:34 PM	-104.9875589	40.51502992
92	e of berm	53.6	4/7/2023 6:05:27 PM	-104.9874	40.51482831
93	e of berm short traffic	68	4/7/2023 6:07:06 PM	104.9873087	40.51467939
94	e berm no traffic short berm	55.4	4/7/2023 6:08:35 PM	-104.9872092	40.51454719
95	e berm no traffic short berm	55.4	4/7/2023 6:10:00 PM	104.9871689	40.51454725
96	e berm no traffic short berm	53.7	4/7/2023 6:11:00 PM	-104.986951	40.51426942
97	e berm no traffic	53.3	4/7/2023 6:12:59 PM	-104.9867674	40.51402386
98	e berm short no traffic	51.9	4/7/2023 6:13:45 PM	-104.9866877	40.51394702
99	e of berm short no traffic	52.2	4/7/2023 6:15:00 PM	-104.9866871	40.51394614
100	e berm short no traffic	52.6	4/7/2023 6:16:00 PM	-104.9863735	40.51352549
101	e berm no traffic	50.1	4/7/2023 6:17:37 PM	-104.9861975	40.51328541
102	e berm no traffic short	49.7	4/7/2023 6:19:45 PM	-104.9859832	40.51303751
103	w berm	51.1	4/7/2023 6:20:46 PM	-104.9862915	40.51310595
104	w berm	49.9	4/7/2023 6:21:28 PM	104.986365	40.51302149
105	w berm	50	4/7/2023 6:22:00 PM	-104.9864958	40.5129744
106	w berm	50.9	4/7/2023 6:22:43 PM	-104.9867311	40.51312533
107	w berm	50.7	4/7/2023 6:23:00 PM	-104.9869448	40.51337817
108	w berm	53.5	4/7/2023 6:24:00 PM	104.9871773	40.51370128
109	w berm	55.6	4/7/2023 6:25:00 PM	-104.9874197	40.51386682
110	w berm	57.4	4/7/2023 6:26:26 PM	-104.9876007	40.51399059
111	w berm	59.9	4/7/2023 6:27:15 PM	104.9877965	40.51417907
112	w berm near plant	60.2	4/7/2023 6:28:05 PM	-104.9879236	40.51442107
113	w berm	60.9	4/7/2023 6:28:57 PM	-104.987566	40.51458687
114	w berm	55.3	4/7/2023 6:29:45 PM	-104.9876511	40.51479517
115	w berm	56.9	4/7/2023 6:40:20 PM	-104.987336	40.51442271
116	w berm	58.9	4/7/2023 6:40:00 PM	-104.9875152	40.51457666
117	w berm	54.8	4/7/2023 6:41:41 PM	-104.9876605	40.5147872
118	w berm drum visible	59.9	4/7/2023 6:42:21 PM	-104.9877654	40.51496575
119	w berm	58.6	4/7/2023 6:42:00 PM	-104.9878389	40.515111
120	w berm behind trailer	54.4	4/7/2023 6:43:27 PM	104.9879647	40.51528586
121	w berm no trailer	59.2	4/7/2023 6:46:56 PM	-104.9881493	40.51526332

122	w berm	54.2	4/7/2023 6:47:37 PM	-104.988035	40.51542371
123	w berm	58.8	4/7/2023 6:48:31 PM	-104.9881724	40.51558925
124	w berm	56.3	4/7/2023 6:49:00 PM	-104.9881537	40.51565077
125	w berm low	57.2	4/7/2023 6:50:43 PM	-104.9882969	40.51577188
126	in lot	54.8	4/7/2023 6:51:34 PM	-104.988482	40.51558751
127	near gas pumps	61.1	4/7/2023 6:52:22 PM	-104.9885102	40.51530489
128	near fuel tanks	63.5	4/7/2023 6:53:25 PM	-104.9885992	40.51501121
129	near fuel tanks	71.2	4/7/2023 6:54:16 PM	-104.9888573	40.51481042
130	next to plant	80.2	4/7/2023 6:55:32 PM	-104.9893388	40.51443486
131	traffic	55.6	4/7/2023 7:08:00 PM	-104.9874825	40.51615594
132	traffic	51	4/7/2023 7:09:00 PM	-104.9871814	40.51607654
133	traffic	63.3	4/7/2023 7:10:00 PM	-104.9872288	40.51591673
134	traffic	75.7	4/7/2023 7:11:06 PM	-104.9873161	40.51575002
135	traffic	54.6	4/7/2023 7:11:48 PM	-104.9869811	40.51571511
136	traffic	74.3	4/7/2023 7:12:00 PM	-104.9870226	40.51552781
137	traffic	59.9	4/7/2023 7:13:13 PM	-104.9870226	40.51552781
138	traffic	58.6	4/7/2023 7:13:00 PM	-104.9867132	40.51541922
139	traffic	62.1	4/7/2023 7:14:04 PM	-104.9864725	40.51528836
140	traffic	52.1	4/7/2023 7:14:46 PM	-104.9862897	40.5151082
141	traffic	52.2	4/7/2023 7:15:40 PM	-104.9863966	40.51482557
142	traffic	63.3	4/7/2023 7:15:00 PM	-104.9864664	40.51470117
143	traffic	58.4	4/7/2023 7:16:20 PM	-104.9864664	40.51470117
144	traffic	59.2	4/7/2023 7:17:08 PM	-104.9860095	40.51449092
145	traffic	55.3	4/7/2023 7:17:00 PM	-104.9860973	40.51418729
146	traffic	62.4	4/7/2023 7:19:09 PM	-104.9857879	40.514088
147	traffic	51.3	4/7/2023 7:19:57 PM	-104.9856588	40.51389171
148	traffic	66.2	4/7/2023 7:20:30 PM	-104.9857764	40.51368087
149	traffic	68.8	4/7/2023 7:21:11 PM	-104.9854962	40.51360441
150	traffic	60.7	4/7/2023 7:22:05 PM	-104.9852784	40.51325071
151	traffic	60.2	4/7/2023 7:22:48 PM	-104.9849883	40.51299582
152	notraf	51.2	4/7/2023 7:23:06 PM	-104.9849883	40.51299582
153	notraf	50.9	4/7/2023 7:23:00 PM	-104.9852427	40.51310813
154	notraf	51	4/7/2023 7:24:29 PM	-104.9852603	40.51335624
155	notraf	51.7	4/7/2023 7:26:00 PM	-104.9856871	40.5135585
156	notraf	50.3	4/7/2023 7:27:27 PM	-104.9856994	40.51393784
157	notraf	54.1	4/7/2023 7:27:58 PM	-104.9860676	40.51405778
158	notraf	51.1	4/7/2023 7:29:00 PM	-104.9860919	40.51437655
159	notraf	54.8	4/7/2023 7:29:57 PM	-104.9864598	40.51452987
160	notraf	51.6	4/7/2023 7:30:00 PM	-104.9863387	40.51497813
161	notraf	52.8	4/7/2023 7:32:06 PM	-104.9868639	40.51515225
162	notraf	50.1	4/7/2023 7:32:00 PM	-104.9867962	40.51543861
163	notraf	53.7	4/7/2023 7:33:14 PM	-104.9872268	40.515598
164	notraf	51.3	4/7/2023 7:33:46 PM	-104.9871603	40.51577126
165	notraf	52	4/7/2023 7:34:00 PM	-104.9874932	40.51596994
166	e berm notraf	54.2	4/7/2023 7:49:00 PM	-104.9859891	40.51297698
167	eberm	51.1	4/7/2023 7:50:15 PM	-104.9857931	40.51272739
168	e berm notraf	52.4	4/7/2023 7:50:00 PM	-104.9856127	40.51247722
169	e berm notraf	63.2	4/7/2023 7:51:25 PM	-104.985399	40.51226464
170	eberm near const	55.2	4/7/2023 7:52:59 PM	-104.9852359	40.51205178
171	e berm near const	51.6	4/7/2023 7:53:19 PM	-104.985111	40.51188121
172	eberm near const	52.8	4/7/2023 7:53:00 PM	-104.9849351	40.51167132
173	e berm near const	51.2		-104.9848753	40.51159386
174	eberm near const	56.1	4/7/2023 7:54:35 PM	-104.9848754	40.51159382
175	e berm near const	56.8	4/7/2023 7:55:00 PM	-104.9845698	40.51119898
176	e berm near const	62.2	4/7/2023 7:55:33 PM	-104.9843806	40.51100116
177	near mine ent	70.3	4/7/2023 7:56:14 PM	-104.9842637	40.51083708
178	e fence near const	66.5	4/7/2023 7:57:10 PM	-104.9840539	40.510634
179	efence near const	64.9	4/7/2023 7:58:14 PM	-104.9838246	40.51033082
180	e fence	56.1	4/7/2023 7:58:57 PM	-104.9835891	40.51007525
181	e fence	53.9	4/7/2023 7:59:00 PM	-104.9835669	40.51004496
182	e fence	54.4	4/7/2023 8:00:00 PM	-104.9832367	40.5096872

183	e fence	52.5	4/7/2023 8:00:30 PM	-104.9830468	40.50944417
184	e fence	51.9	4/7/2023 8:00:49 PM	-104.9829438	40.50929655
185	near road traf	54.1	4/7/2023 8:01:28 PM	-104.9827055	40.50899792
186	near road	54.7	4/7/2023 8:01:57 PM	-104.9827255	40.50880777
187	near road	50.8	4/7/2023 8:02:00 PM	-104.9827733	40.50876808
188	near road	52.4	4/7/2023 8:02:24 PM	-104.9831322	40.50863469
189	near road	54.5	4/7/2023 8:03:00 PM	-104.9835214	40.5086335
190	traffic	67	4/7/2023 8:03:00 PM	-104.9837712	40.50862298
191	near road	53.2	4/7/2023 8:04:00 PM	-104.9840821	40.50865807
192	traffic	70.2	4/7/2023 8:04:00 PM	-104.9841172	40.50864887
193	traffic	57.3	4/7/2023 8:04:58 PM	-104.9845863	40.50863817
194	near road	50.2	4/7/2023 8:05:29 PM	-104.9850571	40.50863525
195	near road	53.3	4/7/2023 8:05:54 PM	-104.9852449	40.50864235
196	near road	52.3	4/7/2023 8:06:38 PM	-104.9858575	40.50864422
197	near road	53.3	4/7/2023 8:07:03 PM	-104.9862416	40.50866938
198	near road	54.2	4/7/2023 8:07:20 PM	-104.9863714	40.50866622
199	near road	51	4/7/2023 8:07:48 PM	-104.9868393	40.50870101
200	traffic	68.1	4/7/2023 8:08:00 PM	-104.9872617	40.50869422
201	near road	70	4/7/2023 8:08:00 PM	-104.987517	40.50870119
202	near road	49.4	4/7/2023 8:08:50 PM	-104.9877238	40.50870653
203	near road	60.2	4/7/2023 8:09:09 PM	-104.9879739	40.50870661
204	near road	53.2	4/7/2023 8:09:30 PM	-104.9882443	40.50871903
205	near road	57.5	4/7/2023 8:09:59 PM	-104.9886961	40.50871694
206	near road	65.5	4/7/2023 8:10:00 PM	-104.9890574	40.50872456
207	near road	57.5	4/7/2023 8:10:47 PM	-104.9893088	40.50873178
208	near road	54.4	4/7/2023 8:11:00 PM	-104.9895993	40.50874361
209	near road	58.6	4/7/2023 8:11:22 PM	-104.9898225	40.50877317
210	near road	55.4	4/7/2023 8:11:00 PM	-104.9899866	40.50878194
211	near road	59.8	4/7/2023 8:11:49 PM	-104.9901944	40.5087987
212	near road	63.9	4/7/2023 8:12:03 PM	-104.9903998	40.50882484
213	near road	57.5	4/7/2023 8:12:27 PM	-104.9906639	40.5090198
214	near road	57.9	4/7/2023 8:12:00 PM	-104.9907688	40.50920727
215	near road	63.6	4/7/2023 8:13:00 PM	-104.9908394	40.50933166
216	near road	69.8	4/7/2023 8:13:12 PM	-104.9909011	40.50946146
217	near road	63.5	4/7/2023 8:13:33 PM	-104.9910069	40.50969336
218	near road	65.1	4/7/2023 8:13:48 PM	-104.9910718	40.5098547
219	near road	69.8	4/7/2023 8:13:59 PM	-104.9911302	40.50999862
220	near road	72.5	4/7/2023 8:14:11 PM	-104.9911563	40.5100732
221	near road	65.7	4/7/2023 8:14:37 PM	-104.9911954	40.51029931
222	near road	57.7	4/7/2023 8:16:00 PM	-104.9903827	40.51068172
223	near road	54.3	4/7/2023 8:16:49 PM	-104.9900851	40.51059797
224	near road	53.8	4/7/2023 8:17:20 PM	-104.9897251	40.51046858
225	near road	48.7	4/7/2023 8:17:00 PM	-104.9895213	40.51040876
226	near road	53.3	4/7/2023 8:18:00 PM	-104.9892458	40.51030915
227	near road	53.3	4/7/2023 8:18:34 PM	-104.9890193	40.51018877
228	near road	57.8	4/7/2023 8:18:58 PM	-104.9886873	40.51005198
229	near road	59.7		-104.9883941	40.50993688
230	near road	69.2	4/7/2023 8:19:58 PM	-104.9880835	40.50980737
231	near road	72.1	4/7/2023 8:20:15 PM	-104.9878463	40.50966296
232	near road	65.1	4/7/2023 8:20:00 PM	-104.9876918	40.50954964
233	near road	57.3	4/7/2023 8:20:53 PM	-104.9874169	40.50934383
234	near road	56.5	4/7/2023 8:21:00 PM	-104.9870996	40.50924989
235	near road	61.5	4/7/2023 8:21:29 PM	-104.9868371	40.50919673
236	near road	57.7	4/7/2023 8:22:15 PM	-104.9863362	40.50931272
237	near road	46.1	4/7/2023 8:22:55 PM	-104.9861662	40.50948613
238	near road	51.1	4/7/2023 8:23:00 PM	-104.985983	40.50970917
239	near road	59.5		-104.9859836	40.50971128
240	near road	52.3	4/7/2023 8:24:32 PM	-104.9851966	40.50986211
241	const	60.7	4/7/2023 8:25:19 PM	-104.9845863	40.5098809
242	South Property	61.1	4/7/2023 8:25:00 PM	-104.9845794	40.51015826
243	const	62.7	4/7/2023 8:26:03 PM	-104.9846314	40.51037918

244 South Property	59.5	4/7/2023 8:26:00 PM	-104.9847747	40.51055611
245 South Property	54.6	4/7/2023 8:26:00 PM	-104.9848867	40.51072988
246 South Property	53.6	4/7/2023 8:27:01 PM	-104.985018	40.51086734
247 South Property	51	4/7/2023 8:27:19 PM	-104.9851064	40.51101849
248 South Property	51.1	4/7/2023 8:27:43 PM	-104.9851373	40.51108481
249 South Property	53.8	4/7/2023 8:28:00 PM	-104.9852506	40.51124061
250 South Property	56.2	4/7/2023 8:28:37 PM	-104.9855253	40.51137921
251 semi truck	59.1	4/7/2023 8:29:02 PM	-104.985687	40.51158107
252 South Property	50.6	4/7/2023 8:29:21 PM	-104.9857935	40.51174714
253 South Property	51.1	4/7/2023 8:29:49 PM	-104.985951	40.51199383

Appendix C – Calibration Certificates

www.casellasolutions.com

CASELLA

Certificate of Conformity and Calibration FA05191

Instrument Type:-	CEL-633C		
Serial Number	4210644		
Firmware revision	V006-05		
Microphone Type:-	CEL-252	**Preamplifier Type:-**	CEL-495
Serial Number	90996	Serial Number	005042
Instrument Class/Type:-	2		

Applicable standards:-

IEC 61672: 2002 / EN 60651 (Electroacoustics - Sound Level Meters)
IEC 60651 1979 (Sound Level Meters), ANSI S1.4: 1983 (Specifications For Sound Level Meters)

Note:- *The test sequences performed in this report are in accordance with the current Sound level meter Standard - IEC61672. The combination of tests performed are considered to confirm the products electro-acoustic performance to all applicable standards including superceeded Sound Level Meter Standards - IEC60651 and IEC60804.*

Test Conditions:-	22 °C	Test Engineer:-	Nicola Cartwright
	32 %RH	Date of Issue:-	July 4, 2022
	1014 mBar		

Declaration of conformity:-

This test certificate confirms that the instrument specified above has been successfully tested to comply with the manufacturer's published specifications. Tests are performed using equipment traceable to national standards in accordance with Casella's ISO 9001:2015 quality procedures. This product is certified as being compliant to the requirements of the CE Directive.

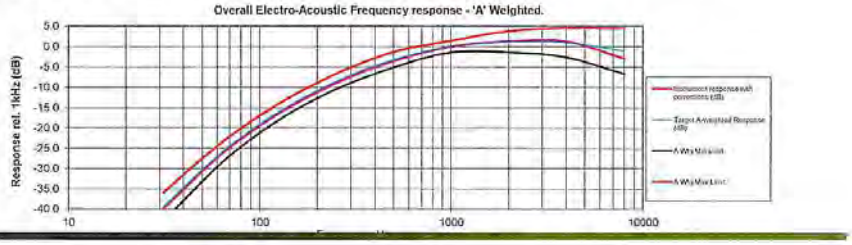
Test Summary:-

Self Generated Noise Test	**All Tests Pass**
Electrical Signal Test Of Frequency Weightings	**All Tests Pass**
Frequency & Time Weightings At 1 kHz	**All Tests Pass**
Level Linearity On The Reference Level Range	**All Tests Pass**
Toneburst Response Test	**All Tests Pass**
C-peak Sound Levels	**All Tests Pass**
Overload Indication	**All Tests Pass**
Acoustic Tests	**All Tests Pass**

Combined Electro-Acoustic Frequency Response - *A Weighted*

Combined Electro-Acoustic Frequency Response - A Weighted (IEC 61672-3:2006)

The following A-Weighted frequency response graph shows this instruments overall frequency response based upon the application of multi-frequency pressure field calibrations. The microphones Pressure to Free field correction coefficients are applied to pressure response. Reference level taken at 1kHz.

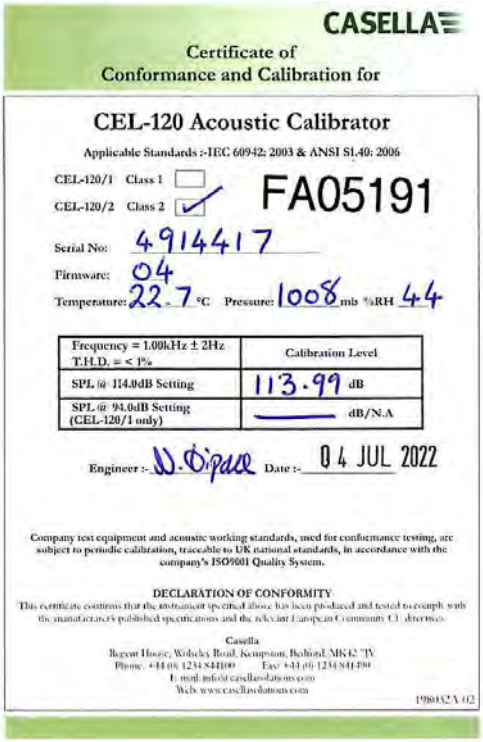


Casella UK
Regent House, Wolseley Road
Kempston, Bedford
MK42 7JY
United Kingdom
Tel: +44 (0) 1234 844100
Fax: +44(0) 1234 841490
E-mail: info@casellasolutions.com

Casella US
13 Pratts Junction Road,
Sterling, MA 01564-2305
USA
Toll Free: (800) 366-2998
E-mail: info-us@casellasolutions.com

Casella India
Ideal Industries India Pvt Ltd
229-230, Spaze2go, Tower-19 Sohna Road
Sector-47, Gurgaon-122001, Haryana (India)
Tel: +91 124 4495100
E-mail: casella.sales@ideal-industries.in

Casella China
Room 305, Building 1, No. 1385, Chuangye
Road, Pudong District, Shanghai, China
Telephone: +86-21 31263188
Email: info@casellaasiapacific.cn



CASELLA

Certificate of
Conformance and Calibration for

CEL-120 Acoustic Calibrator

Applicable Standards :-IEC 60942: 2003 & ANSI S1.40: 2006

CEL-120/1 Class 1 ☐
CEL-120/2 Class 2 ☑ FA05191

Serial No: 4914417
Firmware: 04
Temperature: 22.7 °C Pressure: 1008 mb %RH 44

Frequency = 1.00kHz ± 2Hz T.H.D. = < 1%	Calibration Level
SPL @ 114.0dB Setting	113.99 dB
SPL @ 94.0dB Setting (CEL-120/1 only)	——— dB/N.A

Engineer :- D. Dipple Date :- 04 JUL 2022

Company test equipment and acoustic working standards, used for conformance testing, are subject to periodic calibration, traceable to UK national standards, in accordance with the company's ISO9001 Quality System.

DECLARATION OF CONFORMITY
This certificate confirms that the instrument specified above has been produced and tested to comply with the manufacturer's published specifications and the relevant European Community CE directives.

Casella
Regent House, Wolseley Road, Kempston, Bedford, MK42 7JY
Phone: +44 (0) 1234 844100 Fax: +44 (0) 1234 841490
E-mail: info@casellaofdanmark.com
Web: www.casellaofdanmark.com

198052A/02

www.casellasolutions.com

CASELLA

Certificate of Conformity and Calibration FA05191

Instrument Type:-	CEL-633C		
Serial Number	4210644		
Firmware revision	V006-05		
Microphone Type:-	CEL-252	Preamplifier Type:-	CEL-495
Serial Number	90996	Serial Number	005042
Instrument Class/Type:-	2		

Applicable standards:-

IEC 61672: 2002 / EN 60651 (Electroacoustics - Sound Level Meters)
IEC 60651 1979 (Sound Level Meters), ANSI S1.4: 1983 (Specifications For Sound Level Meters)

Note:- *The test sequences performed in this report are in accordance with the current Sound level meter Standard - IEC61672. The combination of tests performed are considered to confirm the products electro-acoustic performance to all applicable standards including superceeded Sound Level Meter Standards - IEC60651 and IEC60804.*

Test Conditions:-	22 °C 32 %RH 1014 mBar	Test Engineer:- Date of Issue:-	Nicola Cartwright July 4, 2022

Declaration of conformity:-

This test certificate confirms that the instrument specified above has been successfully tested to comply with the manufacturer's published specifications. Tests are performed using equipment traceable to national standards in accordance with Casella's ISO 9001:2015 quality procedures. This product is certified as being compliant to the requirements of the CE Directive.

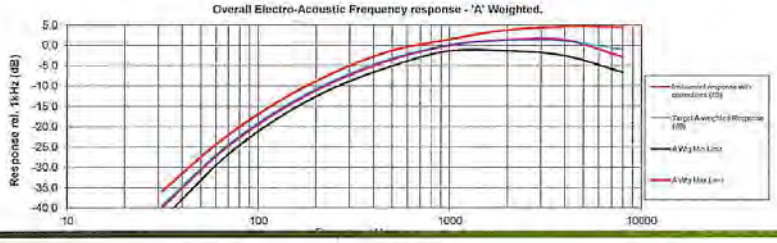
Test Summary:-

Self Generated Noise Test	All Tests Pass
Electrical Signal Test Of Frequency Weightings	All Tests Pass
Frequency & Time Weightings At 1 kHz	All Tests Pass
Level Linearity On The Reference Level Range	All Tests Pass
Toneburst Response Test	All Tests Pass
C-peak Sound Levels	All Tests Pass
Overload Indication	All Tests Pass
Acoustic Tests	All Tests Pass

Combined Electro-Acoustic Frequency Response - *A Weighted*

Combined Electro-Acoustic Frequency Response - A Weighted (IEC 61672-3:2006)

The following A-Weighted frequency response graph shows this instruments overall frequency response based upon the application of multi-frequency pressure field calibrations. The microphones Pressure to Free field correction coefficients are applied to pressure response. Reference level taken at 1kHz.



Casella UK
Regent House, Wolseley Road
Kempston, Bedford
MK42 7JY
United Kingdom
Tel: +44 (0) 1234 844100
Fax: +44(0) 1234 841460
E-mail: info@casellasolutions.com

Casella US
13 Pratts Junction Road
Sterling, MA 01564-2305
USA
Toll Free: (800) 366-2669
E-mail: info-us@casellasolutions.com

Casella India
Ideal Industries India Pvt Ltd
229-230, Spazedge, Tower-D Sohna Road,
Sector-47, Gurgaon-122001, Haryana (India)
Tel: +91 124 4495100
E-mail: casella.sales@ideal-industries.in

Casella China
Room 305, Building 1, No. 1235, Chuangye
Road, Pudong District, Shanghai, China
Telephone: +86-21-31263168
Email: info@casellasolutions.cn

Community Noise Assessment

Connell Resources Inc
Wellington, Colorado
Assessment Date: May 12, 2023
Report Date: May 19, 2023

Antea®Group

Understanding today.
Improving tomorrow.

PREPARED FOR
Connell Resources, Inc.
7785 Highland Meadows Pkwy #100,
Windsor, CO

PREPARED BY
Antea Group

May 19, 2023

Project # 2023-01-501742

us.anteagroup.com

The logo and ANTEA are registration trademarks of Antea USA, Inc.

Contents

1.0 Executive Summary 1
2.0 Introduction 1
2.1 Description of Operations 2
2.2 Standards and Guidelines 2
3.0 Summary of Results 5
3.1 Sound Level Survey 5
4.0 Recommendations 4
5.0 Discussion 4
6.0 Remarks 5

Tables

Table 1 - Regulatory Noise Ordinance Sound Thresholds
Table 2 - Inverse Square Law Calculations

Appendices

Appendix A - Sound Level Mapping
Appendix B - Sound Level Meter Data
Appendix C – Calibration Certificates

Noise Assessment

Connell Resources, Inc.
Wellington, CO

1.0 EXECUTIVE SUMMARY

Antea®Group, at the request of Connell, completed a Baseline Community Noise Assessment of its Wellington, CO Site. The Community Noise Assessment was performed on May 12, 2023. Local on-site guidance was provided by Brandon Martin of Connell Resources. The Community Noise Assessment included on-site measurement and mapping of sound levels at various locations throughout the property, along adjacent roadways, and around the entire perimeter of the property.

Antea Group collected instantaneous sound levels using a hand-held sound level meter (SLM) to record the average sound level (L_{avg}), or sound pressure level in decibels on the A-weighted scale (dB(A))(L_{avg}) in various locations within the property lines of Connell Resources. Each sound level measurement was plotted in the Survey123 app, by ArcGIS. The app was used to create a sound map based on the plotted GPS location and collected sound level data. These measurements were compared to the state of Colorado and Larimer County noise ordinances. Sound level maps are provided in **Appendix A** and raw data including specific GPS coordinates is included in **Appendix B.**

Results of the Community Noise Assessment indicate that, while not applicable to Connell Resources as an Industrial operation, the Connell Resources Inc. property in Wellington, CO did not exceed the applicable state of Colorado noise ordinance of 80 db(A). However, current sound levels at the unoccupied, inactive, unstaffed, Connell property exceed the Larimer county noise ordinance. These results indicate that current weather, geographical conditions, and neighboring properties currently generate sound that exceed Larimer county noise ordinances without further operational noise contributions from the Wellington site.

The Wellington site is not currently active and has no operations, activities, active equipment, or personnel on site. On the date of the assessment sound levels were collected to assess a baseline background sound profile for the site. Baseline levels across the entire site ranged from 57.4 db(A) to 71.1 db(A).

The existing sound profile of the Wellington site exceeds the Larimer county noise ordinance of 55db(A) but does not exceed the State of Colorado noise ordinance of 80 db(A). Given the site is already above the Larimer county ordinance, the proposed Connell Resources site in Wellington, CO won't be the cause of the current exceedance of the the Larimer county noise ordinance. Furthermore, given the sound profile previously collected from the Fort Collins site, and the planned erection of dirt berms for noise attenuation, Connell Resources have properly planned to provide effective noise controls at their proposed Wellington location.

2.0 INTRODUCTION

Antea Group conducted on-site sampling at the Connell Resources property located in Wellington, Colorado on May 12, 2023. The purpose of the study was to evaluate the baseline environmental noise levels prior to construction or industrial activities at the proposed Wellington site. These measurements would be compared to local, state, and county community noise ordinances. The scope of work involved using a hand-held type 2 sound level meter to measure sound levels along the entire perimeter of the property, along the north road, and at

various points at the interior of the unoccupied, inactive property for noise mapping. The purpose of this assessment was to collect data of current sound level measurements at the Wellington site to establish a baseline noise profile prior to commencing industrial operations at the proposed Wellington site. Antea Group was unable to compare sound level measurements to the Town of Wellington noise ordinance (Sec. 10-10-10. Unreasonable Noise) as the threshold is determined by members of the Police Department via a prima facie determination for whether a noise is unreasonable.

2.1 DESCRIPTION OF OPERATIONS

The Connell Resources Wellington location has no current operations. The site has various pieces of equipment attachments on site that appear to have been out of use for an extended period at the south end of the property. The majority of the property appears to have been last used for agricultural use prior to acquisition by Connell Resources. On the day of sampling, there were no activities, equipment, or personnel on site and no source of noise generation at any place on or within the Wellington site property lines.

2.2 STANDARDS AND GUIDELINES

Sound Levels were compared to the noise level ordinances established by Larimer County (Ordinance No. 97-03) and the State of Colorado (25-12-103 - Maximum permissible noise levels). Sound level ordinances are provided below in **Table 1.** Connell Resources Inc. is classified as an Industrial facility and is located on land zoned for Industrial Land Use.

Exemptions:

- General traffic
- Railroad noise
- Agricultural equipment
- Aircraft or other federal preemptions
- Emergency vehicles
- Sponsored athletic events
- Non-residential emitters (Larimer County)

The following appendices supplement the results of the Community Noise Assessment discussed in this report:

- Appendix A – Sound Level Mapping
- Appendix B - Sound Level Mapping Data
- Appendix C – Calibration Certificates

Table 1: Regulatory Noise Ordinance Sound Thresholds

Sound Type	Regulatory Body	Noise Ordinance Effective Time	Residential Source db(A)	Commercial Source db(A)	Light Industrial Source db(A)	Industrial Source db(A)	Location of measurement
Continuous Max db(A)	State of Colorado	7 am-7 pm	55	60	70	80	25 feet from noise source property line
		7pm-7am	50	55	65	75	
	Larimer County*	7 am-7 pm	55	NA	NA	NA	At or within the residential source property line
		7pm-7am	50	NA	NA	NA	
<15 minute Max db(A)	State of Colorado	7 am-7 pm	65	70	80	90	25 feet from noise source property line
		7pm-7am	55	60	70	80	
	Larimer County*	7 am-7 pm	55	NA	NA	NA	At or within the residential source property line
		7pm-7am	50	NA	NA	NA	
		7 am-7 pm	50	55	65	75	

Impulse Max db(A)	State of Colorado	7pm-7am	45	50	60	70	25 feet from noise source property line
	Larimer County*	7 am-7 pm	55	NA	NA	NA	At or within the residential source property line
		7pm-7am	50	NA	NA	NA	

*Based on the language of the Larimer County Ordinance, it appears that the ordinance applies solely to noise sources originating from residential or public, non-industrial and non-commercial sources. Section 5 suggests that only sources from residential land use are covered by the ordinance, so the columns for Commercial, Light Industrial, and Industrial Sources are exempt and marked NA (Not Applicable). Please note that Antea Group USA cannot provide legal advice, and any legal interpretations of the noise ordinances should be verified by an attorney licensed to practice in the state of Colorado.

3.0 SUMMARY OF RESULTS

3.1 SOUND LEVEL SURVEY

A Community noise assessment was conducted on May 12, 2023, at the Connell Resources Wellington property as part of the baseline Community Noise Assessment. A TSI Soundpro DL-2 Type II Sound Level Meter (SLM) was set to slow-response, A-weighted scale, 10 db threshold, and equipped with a windscreen. The instrument was pre-calibrated on site and post-calibrated immediately after the survey and had an instrument drift of fewer than 0.1 decibels. The Larimer County and Colorado State ordinances limit valid measurements, collected with a windscreen, to less than 25 miles per hour (mph). Wind speed on the day of the assessment reached a max of 15mph during time on-site were within acceptable valid data collection parameters as defined by the aforementioned ordinances.

The SLM was used to measure instantaneous sound levels (L_{Avg}) in various locations within and outside of the property lines of the Connell Resources Wellington property, and across the street from the north property line. Antea Group did not have permission from property owners on the south, west, or north side of the property lines nor the railroad utility to the east and thus only collected measurements within public and Connell Resources owned property.

A dirt road was located on the north property line and was observed to be used primarily for agricultural-related traffic. During the assessment, approximately 10 cars utilized the road over a period of two hours and were not a substantial source of noise during the assessment. Sound levels were collected on either side of the road with and without traffic.

Each sound level measurement location was plotted in the Survey123 app, by ArcGIS. The app was used to plot sound levels with their correlated locations across the site with an accuracy of 3 meters and used to create a sound map based on the collected data. 202 data points were collected across the property, along the entire property line, and across the road to the north of the property.

Results of the sound level survey are presented in sound maps in **Appendix A** and raw data in **Appendix B.**

A review of the sound level survey data indicates that the baseline noise conditions on the property exceed the noise ordinance for Larimer County of 55db(A) and do not exceed the State of Colorado noise ordinance of 80db(A).

4.0 RECOMMENDATIONS

Based on the results of the community noise assessment Antea Group recommends the following:

- Construct dirt berms along the perimeter of the new site at a sufficient height to adequately contain noise sources within the property lines as a best management practice.
- Monitor background noise at the new Wellington site after construction of the new plant to establish an adjusted community noise assessment during typical plant operation to ensure continued compliance with the State of Colorado noise ordinance of 80db(A).
- Establish communications with the Town of Wellington Police Department and county to clarify what constitutes a prima facie determination of unreasonable noise.

5.0 DISCUSSION

- There was no activity on the farm to the north or west and no measurements were collected during any period of railroad operation. The industrial site to the south did not appear to be operating any equipment or conducting any substantial noise generating activities. The source of noise on site appears to be a feature of the geographical and natural sound profile of the area and not attributable to commercial, residential, or industrial sources in the surrounding area.
- Sound Pressure Theory: Sound waves follow the Inverse Square law which roughly means each doubling of physical distance from a noise source equates to an approximate reduction of 6 decibels. The loudest measurement at the Connell Asphalt plant was 83db(A). A calculation of noise levels at various distances is provided in **Table 2.**

Table 2: Inverse Square Law Calculations

Sound Pressure Level db(A)	Distance (ft)	Sound Pressure Level db(A)	Distance (ft)	Sound Pressure Level db(A)	Distance (ft)
83 (source)	1	55.0	150	38.6	1000
70.6	25	52.5	200		
64.6	50	46.5	400		
58.6	100	44.6	800		

6.0 REMARKS

The recommendations contained in this report represent Antea Group USA, Inc.'s professional opinions based upon the currently available information and are arrived at in accordance with currently accepted professional standards. This report is based upon a specific scope of work requested by the client. The contract between Antea Group USA, Inc. and its client outlines the scope of work, and only those tasks specifically authorized by that contract or outlined in this report were performed. This report is intended only for the use of Antea Group USA, Inc.'s client and anyone else specifically identified in writing by Antea Group USA, Inc. as a user of this report. Antea Group USA, Inc. will not and cannot be liable for unauthorized reliance by any other third party. Other than as contained in this paragraph, Antea Group USA, Inc. makes no express or implied warranty as to the contents of this report.

Antea Group appreciates the opportunity to perform this industrial hygiene evaluation at the Connell Resources Inc. Fort Collins Pit. Please contact us with any questions, or if you would like further assistance in reviewing the information presented above.

Prepared by:

John F. Wright, MPH, CIH, CSP
Senior Professional

Reviewed by:

Jennene Lyda, MS, CIH, CSP
Senior Project Manager

Appendix A – Sound Level Mapping

Legend
Less than 45 db
45 - 50 db
50 - 55 db
Greater than 55 db
Minimum: 57.4 db
Maximum: 71.1 db
0 75 150 300 450 600
Feet
FIGURE 1
SOUND LEVEL MAP
CONNELL - FORT COLLINS
WELLINGTON, CO
PROJECT NO.
XXXXXXX
PREPARED BY
JS
REF SCALE
1:1,800
DATE
5/18/2023
REVIEWED BY
XXX
MAP SCALE
1 INCH = 300 FEET
anteagroup
Z:\GIS Projects\Connell\!Project Template\Fort Collins, CO\Project Number\Layout\Connell Fort Collins Sound Map.mxd

Appendix B - Sound Level Meter Data

ObjectID	Sample Location (Specific Point)	LAVG Reading	Date and Time	x	y
1	north along county 66 connell side	61.6	5/12/2023 20:22	-105.008	40.72577
2	north along county 66 connell side	60.9	5/5/2023 20:23	-105.008	40.72577
3	north along county 66 connell side	61.3	5/12/2023 20:23	-105.008	40.72576
4	north along county 66 connell side	61.1	5/12/2023 20:23	-105.008	40.72577
5	north along county 66 connell side	61	5/12/2023 20:23	-105.008	40.72576
6	north along county 66 connell side	66.4	5/12/2023 20:24	-105.008	40.72573
7	north along county 66 connell side	65.6	5/12/2023 20:24	-105.008	40.72577
8	north along county 66 connell side	65.4	5/12/2023 20:25	-105.008	40.72578
9	north along county 66 connell side	65.2	5/12/2023 20:25	-105.008	40.72578
10	north along county 66 connell side	65	5/12/2023 20:26	-105.007	40.72579
11	north along county 66 connell side	64.9	5/12/2023 20:26	-105.007	40.72577
12	north along county 66 connell side	64.8	5/12/2023 20:26	-105.007	40.72577
13	north along county 66 connell side	64.6	5/12/2023 20:27	-105.007	40.72579
14	north along county 66 connell side	64.6	5/12/2023 20:27	-105.007	40.72578
15	north along county 66 connell side	64.5	5/12/2023 20:27	-105.007	40.72579
16	north along county 66 connell side	64.3	5/12/2023 20:28	-105.007	40.7258
17	north along county 66 connell side	64.2	5/12/2023 20:28	-105.007	40.72581
18	north along county 66 connell side	63.9	5/12/2023 20:29	-105.006	40.72581
19	north along county 66 connell side	63.8	5/12/2023 20:29	-105.006	40.72581
20	north along county 66 connell side	63.8	5/12/2023 20:30	-105.006	40.72581
21	north along county 66 connell side	63.8	5/12/2023 20:30	-105.006	40.72582
22	north along county 66 connell side	63.7	5/12/2023 20:30	-105.006	40.72581
23	north along county 66 connell side	63.6	5/12/2023 20:31	-105.006	40.72582
24	north along county 66 connell side	63.6	5/12/2023 20:31	-105.006	40.72582
25	north along county 66 connell side	63.5	5/12/2023 20:31	-105.005	40.7258
26	north along county 66 connell side	63.4	5/12/2023 20:31	-105.005	40.7258
27	north along county 66 connell side	63.3	5/12/2023 20:32	-105.005	40.72574
28	north along county 66 connell side	63.3	5/12/2023 20:32	-105.005	40.72562
29	north along county 66 connell side	63.2	5/12/2023 20:32	-105.005	40.72563
30	north along county 66 connell side	63.1	5/12/2023 20:33	-105.005	40.72553
31	north along county 66 connell side	63	5/12/2023 20:33	-105.005	40.72539
32	north along county 66 connell side	63	5/12/2023 20:33	-105.005	40.72528
33	north along county 66 connell side	62.9	5/12/2023 20:34	-105.006	40.72528
34	north along county 66 connell side	62.8	5/12/2023 20:34	-105.006	40.72538
35	north along county 66 connell side	62.7	5/12/2023 20:35	-105.006	40.72542
36	north along county 66 connell side	62.6	5/12/2023 20:35	-105.006	40.72555
37	north along county 66 connell side	62.6	5/12/2023 20:35	-105.006	40.72568
38	north along county 66 connell side	62.5	5/12/2023 20:36	-105.006	40.72574
39	north along county 66 connell side	62.4	5/12/2023 20:36	-105.006	40.72591
40	north along county 66 connell side	62.4	5/12/2023 20:36	-105.006	40.7259
41	north along county 66 connell side	62.3	5/12/2023 20:37	-105.006	40.72591
42	north along county 66 connell side	62.3	5/12/2023 20:37	-105.006	40.7259
43	north along county 66 connell side	62.3	5/12/2023 20:37	-105.007	40.72592
44	north along county 66 connell side	62.2	5/12/2023 20:38	-105.007	40.72587
45	north along county 66 connell side	62.2	5/12/2023 20:38	-105.007	40.72587
46	north along county 66 connell side	62.1	5/12/2023 20:38	-105.007	40.72587
47	north along county 66 connell side	62.1	5/12/2023 20:38	-105.007	40.7259
48	north along county 66 connell side	62	5/12/2023 20:39	-105.007	40.72588

49	north along county 66 connell side	61.9	5/12/2023 20:39	-105.007	40.72589
50	north along county 66 connell side	61.9	5/12/2023 20:40	-105.007	40.72589
51	north along county 66 connell side	61.9	5/12/2023 20:40	-105.008	40.72587
52	north along county 66 connell side	61.8	5/12/2023 20:40	-105.008	40.72587
53	north along county 66 connell side	61.8	5/12/2023 20:41	-105.008	40.7259
54	north along county 66 connell side	62.6	5/12/2023 20:41	-105.009	40.72577
55	north along county 66 connell side	62.6	5/12/2023 20:42	-105.009	40.72576
56	north along county 66 connell side	62.5	5/12/2023 20:42	-105.009	40.72573
57	north along county 66 connell side	62.5	5/12/2023 20:42	-105.009	40.72574
58	north along county 66 connell side	62.5	5/12/2023 20:42	-105.009	40.72571
59	north along county 66 connell side	62.4	5/12/2023 20:42	-105.009	40.72569
60	north along county 66 connell side	62.4	5/12/2023 20:43	-105.009	40.72568
61	north along county 66 connell side	62.4	5/12/2023 20:43	-105.009	40.72564
62	north along county 66 connell side	62.3	5/12/2023 20:43	-105.009	40.72564
63	north along county 66 connell side	61	5/12/2023 20:46	-105.009	40.72557
64	north along county 66 connell side	60.1	5/12/2023 20:49	-105.009	40.72574
65	north along county 66 connell side	59.9	5/12/2023 20:49	-105.009	40.72569
66	north along county 66 connell side	59.7	5/12/2023 20:49	-105.009	40.7257
67	north along county 66 connell side	59.4	5/12/2023 20:50	-105.009	40.72571
68	north along county 66 connell side	59.2	5/12/2023 20:50	-105.009	40.72561
69	north along county 66 connell side	58.9	5/12/2023 20:51	-105.009	40.72552
70	north along county 66 connell side	58.8	5/12/2023 20:51	-105.009	40.72544
71	north along county 66 connell side	58.6	5/12/2023 20:51	-105.01	40.72534
72	north along county 66 connell side	58.5	5/12/2023 20:51	-105.01	40.72529
73	w of site on road	58.4	5/12/2023 20:51	-105.01	40.72522
74	w of site on road	58.2	5/12/2023 20:52	-105.01	40.72521
75	w of site on road	58.1	5/12/2023 20:52	-105.01	40.72508
76	w of site on road	58	5/12/2023 20:52	-105.01	40.72501
77	w of site on road	57.9	5/12/2023 20:52	-105.01	40.72495
78	w of site on road	57.8	5/12/2023 20:53	-105.01	40.72488
79	w of site on road	57.7	5/12/2023 20:53	-105.01	40.72474
80	w of site on road	57.6	5/12/2023 20:53	-105.01	40.72463
81	w of site on road	57.6	5/12/2023 20:53	-105.01	40.72452
82	w of site on road	57.4	5/12/2023 20:54	-105.01	40.72446
83	w of site on road	57.4	5/12/2023 20:54	-105.01	40.72435
84	w of site on road	59.7	5/12/2023 20:55	-105.01	40.72427
85	w of site on road	62.3	5/12/2023 20:55	-105.01	40.72419
86	w of site on road	63.4	5/12/2023 20:55	-105.01	40.72409
87	w of site on road	63.7	5/12/2023 20:56	-105.01	40.72405
88	w of site on road	63.8	5/12/2023 20:56	-105.01	40.72394
89	w of site on road	64.3	5/12/2023 20:56	-105.01	40.72386
90	w of site on road	64.3	5/12/2023 20:56	-105.01	40.72376
91	w of site on road	64.7	5/12/2023 20:57	-105.01	40.72365
92	w of site on road	64.6	5/12/2023 20:57	-105.01	40.72356
93	w of site on road	64.6	5/12/2023 20:57	-105.01	40.72349
94	w of site on road	65	5/12/2023 20:57	-105.01	40.72337
95	w of site on road	65.2	5/12/2023 20:58	-105.01	40.72325
96	w of site on road	66.2	5/12/2023 20:58	-105.01	40.72317
97	w of site on road	67.8	5/12/2023 20:58	-105.01	40.72305

98	w of site on road	68.3	5/12/2023 20:59	-105.01	40.72291
99	w of site on road	68.4	5/12/2023 20:59	-105.01	40.7228
100	w of site on road	68.9	5/12/2023 21:00	-105.01	40.72269
101	w of site on road	68.9	5/12/2023 21:00	-105.01	40.72259
102	w of site on road	69.6	5/12/2023 21:00	-105.01	40.72246
103	w of site on road	69.9	5/12/2023 21:01	-105.01	40.72235
104	w of site on road	69.8	5/12/2023 21:01	-105.01	40.72233
105	w of site on road	69.8	5/12/2023 21:01	-105.01	40.72233
106	w of site on road	69.9	5/12/2023 21:01	-105.009	40.72232
107	w of site on road	70	5/12/2023 21:02	-105.009	40.72231
108	w of site on road	70	5/12/2023 21:02	-105.009	40.72232
109	w of site on road	69.9	5/12/2023 21:02	-105.009	40.72226
110	w of site on road	69.9	5/12/2023 21:03	-105.009	40.72226
111	w of site on road	69.9	5/12/2023 21:03	-105.009	40.72224
112	w of site on road	70.5	5/12/2023 21:04	-105.008	40.72225
113	w of site on road	70.6	5/12/2023 21:04	-105.008	40.72221
114	w of site on road	70.7	5/12/2023 21:04	-105.008	40.7222
115	w of site on road	70.8	5/12/2023 21:05	-105.008	40.72221
116	w of site on road	70.9	5/12/2023 21:05	-105.008	40.7222
117	w of site on road	71.1	5/12/2023 21:05	-105.008	40.72219
118	w of site on road	71	5/12/2023 21:06	-105.008	40.72219
119	w of site on road	71	5/12/2023 21:06	-105.008	40.72218
120	w of site on road	71	5/12/2023 21:06	-105.007	40.72217
121	w of site on road	70.9	5/12/2023 21:07	-105.007	40.72216
122	south part of field	70.7	5/12/2023 21:11	-105.007	40.72217
123	south part of field	70.6	5/12/2023 21:11	-105.007	40.72217
124	south part of field	70.6	5/12/2023 21:11	-105.007	40.72217
125	south part of field	70.8	5/12/2023 21:11	-105.007	40.72216
126	south part of field	70.5	5/12/2023 21:12	-105.007	40.72217
127	south part of field	70.4	5/12/2023 21:12	-105.007	40.72216
128	south part of field	70.4	5/12/2023 21:12	-105.007	40.72213
129	south part of field	70.3	5/12/2023 21:12	-105.006	40.72213
130	south part of field	70.2	5/12/2023 21:13	-105.006	40.72212
131	south part of field	70.2	5/12/2023 21:13	-105.006	40.7221
132	south part of field	70.2	5/12/2023 21:14	-105.006	40.72209
133	south part of field	70.1	5/12/2023 21:14	-105.006	40.72209
134	south part of field	70.1	5/12/2023 21:14	-105.006	40.72206
135	south part of field	70	5/12/2023 21:14	-105.006	40.7221
136	south part of field	69.8	5/12/2023 21:16	-105.006	40.72208
137	south part of field	69.8	5/12/2023 21:16	-105.006	40.72215
138	south part of field	69.8	5/12/2023 21:17	-105.006	40.72225
139	south part of field	69.7	5/12/2023 21:17	-105.006	40.72236
140	south part of field	69.7	5/12/2023 21:17	-105.006	40.7225
141	south part of field	69.6	5/12/2023 21:18	-105.006	40.72267
142	south part of field	69.5	5/12/2023 21:18	-105.006	40.72278
143	south part of field	69.5	5/12/2023 21:19	-105.006	40.72296
144	south part of field	69.4	5/12/2023 21:19	-105.006	40.7231
145	East of field	69.3	5/12/2023 21:20	-105.006	40.72321
146	East of field	69.3	5/12/2023 21:21	-105.006	40.72321

147	East of field	69.3	5/12/2023 21:21	-105.006	40.72333
148	East of field	69.2	5/12/2023 21:22	-105.006	40.72342
149	East of field	69.2	5/12/2023 21:22	-105.006	40.72342
150	East of field	69.1	5/12/2023 21:23	-105.006	40.72357
151	East of field	69.1	5/12/2023 21:23	-105.006	40.72365
152	East of field	69	5/12/2023 21:24	-105.006	40.7237
153	East of field	69	5/12/2023 21:24	-105.006	40.7238
154	East of field	69	5/12/2023 21:24	-105.006	40.7239
155	East of field	69	5/12/2023 21:24	-105.006	40.72396
156	East of field	68.9	5/12/2023 21:24	-105.006	40.72401
157	East of field	68.9	5/12/2023 21:25	-105.006	40.7241
158	East of field	68.9	5/12/2023 21:25	-105.006	40.72414
159	East of field	68.9	5/12/2023 21:25	-105.006	40.72419
160	East of field	68.8	5/12/2023 21:25	-105.006	40.72424
161	East of field	68.8	5/12/2023 21:25	-105.006	40.72425
162	East of field	68.8	5/12/2023 21:26	-105.006	40.72429
163	East of field	68.8	5/12/2023 21:26	-105.006	40.72433
164	East of field	68.8	5/12/2023 21:26	-105.006	40.72437
165	East of field	68.8	5/12/2023 21:26	-105.006	40.72442
166	East of field	68.7	5/12/2023 21:26	-105.006	40.72451
167	East of field	68.7	5/12/2023 21:27	-105.006	40.72455
168	East of field	68.7	5/12/2023 21:27	-105.006	40.72458
169	East of field	68.7	5/12/2023 21:27	-105.006	40.72469
170	East of field	68.7	5/12/2023 21:27	-105.006	40.72473
171	East of field	68.6	5/12/2023 21:27	-105.006	40.72476
172	East of field	68.6	5/12/2023 21:28	-105.006	40.72482
173	East of field	68.6	5/12/2023 21:28	-105.006	40.72486
174	East of field	68.6	5/12/2023 21:28	-105.006	40.72491
175	East of field	68.6	5/12/2023 21:28	-105.006	40.72494
176	East of field	68.6	5/12/2023 21:28	-105.006	40.72499
177	East of field	68.5	5/12/2023 21:28	-105.006	40.72503
178	East of field	68.5	5/12/2023 21:28	-105.006	40.72506
179	East of field	68.5	5/12/2023 21:29	-105.006	40.72511
180	East of field	68.5	5/12/2023 21:29	-105.006	40.72515
181	East of field	68.5	5/12/2023 21:29	-105.006	40.72519
182	East of field	68.5	5/12/2023 21:29	-105.006	40.72522
183	East of field	68.4	5/12/2023 21:30	-105.006	40.72526
184	East of field	68.4	5/12/2023 21:30	-105.006	40.72532
185	East of field	68.4	5/12/2023 21:30	-105.006	40.7254
186	East of field	68.4	5/12/2023 21:30	-105.006	40.72544
187	East of field	68.4	5/12/2023 21:30	-105.006	40.72548
188	East of field	68.4	5/12/2023 21:30	-105.006	40.72552
189	East of field	68.3	5/12/2023 21:31	-105.006	40.72557
190	East of field	68.3	5/12/2023 21:31	-105.006	40.72558
191	East of field	68.3	5/12/2023 21:32	-105.006	40.72542
192	East of field	68.2	5/12/2023 21:32	-105.007	40.7252
193	East of field	68.2	5/12/2023 21:33	-105.007	40.72495
194	East of field	68.1	5/12/2023 21:33	-105.007	40.72465
195	East of field	68.1	5/12/2023 21:34	-105.007	40.72439

196	Center of field	68.1	5/12/2023 21:34	-105.007	40.72426
197	Center of field	68	5/12/2023 21:35	-105.008	40.72416
198	Center of field	68	5/12/2023 21:35	-105.008	40.72396
199	Center of field	68	5/12/2023 21:36	-105.008	40.72412
200	Center of field	67.9	5/12/2023 21:36	-105.008	40.72435
201	Center of field	67.9	5/12/2023 21:37	-105.009	40.72462

Appendix C – Calibration Certificates

FA03994

TSI INCORPORATED – OCONOMOWOC

1060 Corporate Center Drive, Oconomowoc, WI 53066 USA
tel 651 490 2811 + toll free 800 245 0779 + web www.tsi.com

An ISO 9001 Registered Company

Certificate of Calibration

Certificate No:1082556A BGT020002

Submitted By: ECO RENTAL SOLUTIONS LLC
7340 TRADE STREET STE A
SAN DIEGO CA 92121-2457

Serial Number: BGT020002
Customer ID: FA03994
Model: SOUNDPRO DL-2 SLM

Date Received: 4/3/2023
Date Issued: 4/11/2023
Valid Until: 4/11/2024

Test Conditions:

Temperature: 18°C to 29°C
Humidity: 20% to 80%
Barometric Pressure: 890 mbar to 1050 mbar

Model Conditions:

As Found: IN TOLERANCE
As Left: IN TOLERANCE

SubAssemblies:

Description:

TYPE 2 PREAMP
MICROPHONE QE 7052 1/2 IN. ELECTRET

Serial Number:

1018 3401
50902

Calibrated per Procedure:53V899

Reference Standard(s):

I.D. Number	Device	Last Calibration	Date Calibration Due
EF000107	QUEST-CAL	11/10/2022	11/10/2023
ET0000556	B&K ENSEMBLE	4/16/2021	4/16/2023

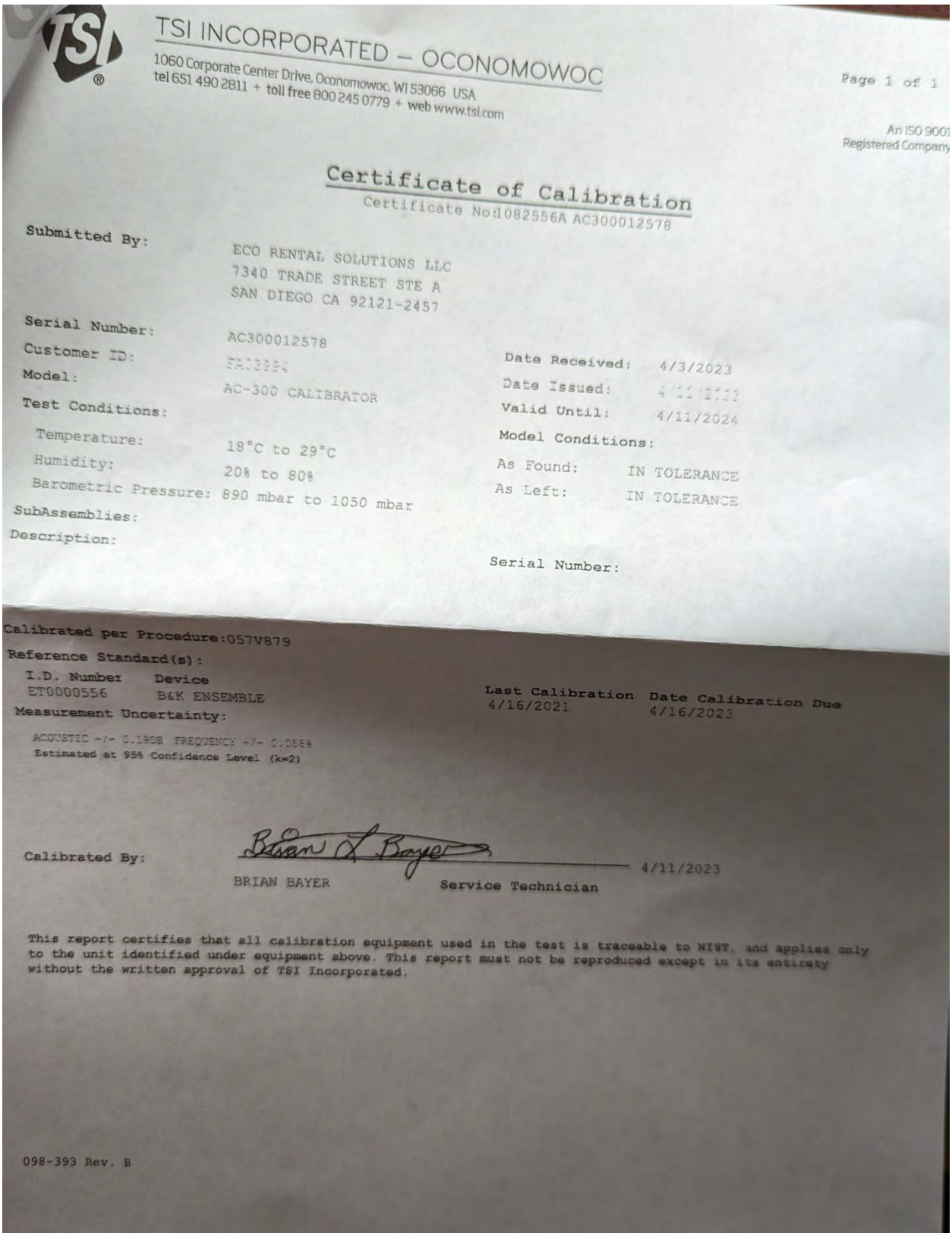
Measurement Uncertainty:

ACOUSTIC +/- 0.29DB
Estimated at 95% Confidence Level (k=2)

Calibrated By: Brian L Bayer 4/11/2023
BRIAN BAYER Service Technician

This report certifies that all calibration equipment used in the test is traceable to NIST, and applies only to the unit identified under equipment above. This report must not be reproduced except in its entirety without the written approval of TSI Incorporated.

098-393 Rev. B



TSI INCORPORATED – OCONOMOWOC
1060 Corporate Center Drive, Oconomowoc, WI 53066 USA
tel 651 490 2811 + toll free 800 245 0779 + web www.tsi.com

Page 1 of 1

An ISO 9001
Registered Company

Certificate of Calibration

Certificate No:1082556A AC300012578

Submitted By: ECO RENTAL SOLUTIONS LLC
7340 TRADE STREET STE A
SAN DIEGO CA 92121-2457

Serial Number: AC300012578
Customer ID: [illegible]
Model: AC-300 CALIBRATOR

Date Received: 4/3/2023
Date Issued: [illegible]
Valid Until: 4/11/2024

Test Conditions:
Temperature: 18°C to 29°C
Humidity: 20% to 80%
Barometric Pressure: 890 mbar to 1050 mbar

Model Conditions:
As Found: IN TOLERANCE
As Left: IN TOLERANCE

SubAssemblies:
Description: **Serial Number:**

Calibrated per Procedure: 057V879

Reference Standard(s):

I.D. Number	Device	Last Calibration	Date Calibration Due
ET0000556	B&K ENSEMBLE	4/16/2021	4/16/2023

Measurement Uncertainty:
ACOUSTIC +/- 0.19DB FREQUENCY +/- 0.05%
Estimated at 95% Confidence Level (k=2)

Calibrated By: Brian L Bayer 4/11/2023
BRIAN BAYER Service Technician

This report certifies that all calibration equipment used in the test is traceable to NIST, and applies only to the unit identified under equipment above. This report must not be reproduced except in its entirety without the written approval of TSI Incorporated.

098-393 Rev. B

TSI INCORPORATED – OCONOMOWOC
1060 Corporate Center Drive, Oconomowoc, WI 53066 USA
tel 651 490 2811 + toll free 800 245 0779 + web www.tsi.com

An ISO 9001
Registered Company

Certificate of Calibration

Certificate No:1082556A AC300012578

Submitted By:
ECO RENTAL SOLUTIONS LLC
7340 TRADE STREET STE A
SAN DIEGO CA 92121-2457

Serial Number: AC300012578
Customer ID: [illegible]
Model: AC-300 CALIBRATOR

Test Conditions:
Temperature: 18°C to 29°C
Humidity: 20% to 80%
Barometric Pressure: 890 mbar to 1050 mbar

SubAssemblies:
Description:

Date Received: 4/3/2023
Date Issued: [illegible]
Valid Until: 4/11/2024

Model Conditions:
As Found: IN TOLERANCE
As Left: IN TOLERANCE

Serial Number:

Calibrated per Procedure:057V879

Reference Standard(s):

I.D. Number	Device	Last Calibration	Date Calibration Due
ET0000556	B&K ENSEMBLE	4/16/2021	4/16/2023

Measurement Uncertainty:

ACOUSTIC +/- 0.19DB FREQUENCY +/- 0.058%
Estimated at 95% Confidence Level (k=2)

Calibrated By: Brian L Bayer 4/11/2023
BRIAN BAYER Service Technician

This report certifies that all calibration equipment used in the test is traceable to NIST, and applies only to the unit identified under equipment above. This report must not be reproduced except in its entirety without the written approval of TSI Incorporated.

98-393 Rev. B

Exhibit-D

Decibel Level Comparison Chart

Decibel Level Comparison Chart

Environmental Noise	*dBA*
Jet engine at 100'	140
Pain Begins	*125*
Pneumatic chipper at ear	120
Chain saw at 3'	110
Power mower	107
Subway train at 200'	95
Walkman on 5/10	94
Level at which sustained exposure may result in hearing loss	*80-90*
City Traffic	85
Telephone dial tone	80
Chamber music, in a small auditorium	75-85
Vacuum cleaner	75
Normal conversation	60-70
Business Office	60-65
Household refrigerator	55
Suburban area at night	40
Whisper	25
Quiet natural area with no wind	20
Threshold of hearing	0

Note: dBA = Decibels, A weighted

Exhibit E

Required Permitting

Permit Type	Permit Number	AIRS ID	Purpose	Governing Entity	Enforcement Fine Range	Governing Agency Inspection Freq.	CRI Inspection Frequency	CRI Testing Frequency
Air	00LR0746*	069-0373	HMA plant permit	CDPHE-APCD	$15,000 - $54,833 per day per violation	Target Freq: Every 2 Years	Monthly, Annual, Per O/M Plan	Monthly, Annual, Per O/M** Plan
Air	20LR0484.XA*	069-0353	HMA plant genset permit	CDPHE-APCD	$15,000 - $54,833 per day per violation	Target Freq: Every 2 Years	Monthly, Annual, Per O/M Plan	Monthly, Annual, Per O/M** Plan
Air	TBD	TBD	Facility air permit for aggregate processin	CDPHE-APCD	$15,000 - $54,833 per day per violation	Target Freq: Every 2 Years	Monthly, Annual	NA
Air	Various	Various	Individual permits for crushing equipmen	CDPHE-APCD	$15,000 - $54,833 per day per violation	Target Freq: Every 2 Years	Monthly, Annual	Depends on each crushing unit
Stormwater	COR900000	NA	Facility industrial stormwater discharge	CDPHE-WQCD	$10,000 - $47,357 per day per violation	Target Freq: Every 2 Years	Quarterly, Annual & Post Storm Events	Bi-monthly, Quarterly, Annual
Petroleum Storage	TBD	NA	AST registration with Colorado	CDLE-OPS	$0-$37,500 /day/violation with no cap	Target Freq: Every 2 Years	Monthly, Annual	Annual
SPCC	NA	NA	Plan for petroleum storage	CDLE-OPS	$0-$37,500 /day/violation with no cap	Target Freq: Every 2 Years	Monthly, Annual	Annual

*Permit number will change when permit issued for new facility

**CDPHE-APCD Approved Operation/Maintenance Plan

CDPHE-APCD (Colorado Department Public Health Environment - Air Pollution Control Division)

CDPHE-WQCD (Colorado Departmetn Public Health Environment - Water Quality Control Division)

CDLE-OPS (Colorado Department Labor & Employment - Oil & Public Safety)

Exhibit F

Letter to CDPHE and Early Settlement Agreement

[see attached]

DocuSign Envelope ID: 67DDA12B-7981-495F-A958-7CDE6292437C

COLORADO
Department of Public Health & Environment

December 5, 2022

SENT VIA ELECTRONIC MAIL

Brandon Martin
Connell Resources, Inc.
7785 Highland Meadows Pky. #100
Fort Collins, CO 80528

Re: Proposed Early Settlement Agreement in the Matter of Connell Resources, Inc.
AIRS No.: 069-0373
Case No.: 2022-180

Dear Brandon Martin:

Connell Resources, Inc. ("CRI") owns and operates the asphalt paving material plant located at 5150 SE Frontage Road, Fort Collins, Larimer County, Colorado ("Facility"). The Facility is subject to the terms and conditions of Colorado Construction Permit Number 00LR0746, Issuance 4 issued to CRI on November 30, 2020 ("Permit Number 00LR0746"); Colorado Air Quality Control Statutes; and Colorado Air Quality Control Commission ("AQCC") Regulations. The Facility's hot mix asphalt equipment (AIRS ID 069-0373-001), is relevant to this enforcement action.

On June 25, 2021, CRI conducted compliance testing on the Facility's hot mix asphalt equipment ("Compliance Test"). The Compliance Test was unobserved by the Colorado Air Pollution Control Division ("Division"). Based on the Compliance Test, and a review of records related to the Facility, the Division issued a Compliance Advisory to CRI on October 20, 2022. On November 15, 2022, the Division and CRI met to discuss the issues identified in the Compliance Advisory.

Based upon a review of the inspection, records related to the Facility, and the information provided by CRI, the Division has determined the following:

A. Pursuant to Permit Number 00LR0746, Condition 7, emissions of air pollutants from the Facility's hot mix asphalt equipment must not exceed 8.5 tons per year of NOx and 19.9 tons per year of CO. Pursuant to Permit Number 00LR0746, Condition 19, a source initial compliance test must be conducted on the main stack to measure and demonstrate compliance with the pollutant emission rates in the permit. The compliance test must be conducted in accordance with the Division's Compliance Test Manual. The Compliance Test conducted on June 25, 2021 was stopped by CRI before completion due to failing test results. CRI was therefore out of compliance with the hot mix asphalt equipment NOx and CO emission rates. From June 25, 2021 to October 20, 2021, CRI failed to demonstrate compliance with the hot mix asphalt equipment NOx and CO emission rates, violating Permit Number 00LR0746, Conditions 7 and 19.

4300 Cherry Creek Drive S., Denver, CO 80246-1530 P 303-692-2000 www.colorado.gov/cdphe
Jared Polis, Governor | Jill Hunsaker Ryan, MPH, Executive Director

On October 20, 2021, CRI successfully conducted a full compliance test of the hot mix asphalt equipment, demonstrating compliance with the emission rates in Permit Number 00LR0746.

The Colorado Air Pollution Prevention and Control Act, at § 25-7-122(1)(b), C.R.S., specifies the penalty for such violations. The monetary amount of the Division's settlement offer specified below takes into account, among other factors, the magnitude and severity of the violation, cooperation of the company, as well as the prior history of violations of air quality requirements associated with any of the company's facilities/operations in the State of Colorado (including a company's parent or subsidiary relations, if applicable). Settlement offers are based on the evaluation of the same factors and criteria in all cases. Based upon CRI's cooperation, and its efforts to bring its operations into compliance with the regulations and permit conditions identified above, the Division acknowledges that CRI has appropriately and adequately addressed all compliance issues identified above. In the interest of settling the matters cited herein, the Division therefore offers the following settlement in accordance with the Division's settlement policy.

1. Payment of a reduced penalty in the sum of **Seven Thousand Dollars ($7,000.00)**. Payment of the penalty precludes further enforcement by the Division for the above-described violation against CRI. The Division retains its authority to take enforcement actions based on any and all violations not specifically described above.

2. Entering into this settlement shall not constitute an admission of violation of the air quality laws, or the alleged facts relating thereto, nor shall any third party infer it to be such an admission in any administrative or judicial proceeding. However, CRI agrees not to challenge the factual or legal determinations herein, the Division's authority to bring, or the court's jurisdiction to hear, any action, insofar as it pertains to the matters contained herein, to enforce the terms of this settlement agreement. The described violation will constitute part of CRI's compliance history for any purpose for which such history is relevant.

This letter constitutes an offer of settlement and is not a demand for payment. Please contact me if you wish to discuss this offer of settlement. We remain willing to consider any information you wish to submit related to the violation. Please be advised, however, that the offer of settlement contained in this letter is predicated on resolving this matter within fifteen (15) days of the date of this settlement proposal letter. If you elect to continue the negotiation of this matter beyond that date, this offer shall be deemed withdrawn, and any penalty mitigation built into this settlement proposal may be revoked. If you require additional time to evaluate this settlement proposal or discuss remaining issues with the Division, however, please contact me regarding your request for an extension of the offer. Any extension of the offer, if agreed to by the Division, must be confirmed, in writing, by the Division.

If the above terms are acceptable to you, please have the appropriate person sign and return this letter and send a check in the sum of **$7,000.00**, made payable to the Colorado Department of Public Health and Environment, to

Air Pollution Control Division
Attn: Heather Wuollet
4300 Cherry Creek Drive South
APCD-SS-B1
Denver, Colorado 80246-1530

This offer of settlement, upon being fully endorsed by both the Division and CRI, shall constitute full and final resolution of the noncompliance issues identified herein and in the Compliance Advisory issued to CRI.

You may write or call to request a settlement conference if you wish to discuss the matter with representatives of the Division's compliance staff. If we do not receive a response from you within fifteen (15) days of the date of this letter, we will assume that you are not interested in resolving this matter as outlined above. Please call me, at 303-692-3259, or Heather Wuollet, at 720-515-0279, if you have any further questions regarding this matter.

Sincerely,

DocuSigned by:

Shannon McMillan
Compliance and Enforcement Program Manager

I certify that I am authorized by Connell Resources, Inc. to execute this settlement agreement and bind Connell Resources, Inc., and any affiliated entities, to the terms and conditions of this agreement. I have read the above settlement and agree to the terms and conditions of this offer.

Name: John M Warren

Title: President

DocuSigned by:

Signature	970.223.3151 Telephone Number	12/19/2022 Date

cc: Shannon McMillan, APCD
Paul Carr, APCD
Heather Wuollet, APCD
Ben Cappa, APCD
Tom Roan, Attorney General's Office
Jeffrey Bishop, APCD
Beth Pilson, APCD
Tom Lovell, APCD
Michael Stovern, EPA (Region VIII)
File

August 2, 2021

Colorado Department of Public Health and Environment
APCD-SS-B1
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

RE: Notification of Violation/Stack Test Memo Response – Construction Permit 00LR0746

To Whom It May Concern,

This letter transmits a response to an e-mail sent by Joe Richhiuto on 07/27/2021 regarding a Notification of Violation from a 06/25/2021 stack test that was required for self-certification. Before the alleged violation is addressed, a brief timeline of related events follows:

1) 02/14/2019, Construction Permit 00LR0746 APEN modification submitted for a new burner
2) 11/30/2020, Construction Permit 00LR0746 issued
3) 03/15/2021, Notice of Start-Up submitted
4) 04/01/2021, Burner tuned by Southeastern Plant Services (see attachment 4.A)
5) 06/25/2021, Stack test completed by erthwrks (see attached Test Report in e-mail)
6) 07/27/2021, Notification of Violation – Stack Test Memo received via e-mail from APCD (see attachment 5.A)

After reviewing the 06/25/2021 stack test report, the APCD concludes in the Stack Test Memo there is an exceedance of the 8.5 TPY NOx limit. Connell Resources, Inc (CRI) does **NOT** agree with this with assumption and has evidence to prove a NOx permit exceedance has not occurred.

Please refer to Unit 650001: TC HMA Plant – Production and Emissions spreadsheet (see attachment 1.A) and monthly Product Report records for March – July 24th, 2021 (see attachment 1.B - 1.F). The production total from November 30, 2020 – July 24, 2021, is 63,205 tons. Using the emissions factor of 0.077 lb/ton of asphalt produced from erthwrks Air Emissions Compliance Test Summary of Results (see attachment 2.A), the calculated NOx emissions since the November 30, 2020 are 2.43 tons and do not exceed the NOx 8.5 TPY limit. See first calculation below:

1. *63,205 tons / 2000 lb/ton * 0.077 lb/ton asphalt produced = 2.433 Tons*

2. *220,082 tons / 2000 lb/ton * 0.077 lb/ton asphalt produced = 8.502 TPY*

CONNELL RESOURCES, INC. • 7785 HIGHLAND MEADOWS PARKWAY, SUITE 100 • FORT COLLINS, CO 80528-8988 • TEL (970) 223.3151 • FAX (970) 223.3191

CONNELL

CRI is aware that continued production at the rate of 0.077 lb/ton of asphalt produced will exceed the NOx limit of 8.5 TPY **if** 220,825 tons of asphalt (see second calculation above) are made in a 12-month period. To prevent this from happening and to meet self-certification requirements, CRI is making significant changes by switching from on-spec used oil and investing in either propane or CNG to fuel the HMA plant. At this point in time, a conversion to either propane or CNG will not occur until December 2021 due to factory shortages on all components necessary for a conversion. Please see the Maxam Equipment, Inc. proposal from 07/22/2021 (see attachment 3.A) and update to original proposal from 07/29/2021 (see attachment 3.B) for timeline regarding part availability due to supply chain issues. The Maxam Equipment, Inc proposal is specifically for a CNG conversion. CRI is waiting for documentation from another vendor regarding a propane conversion and will make this documentation available to APCD once received. CRI has been verbally notified that a propane conversion is at least 16 weeks out due to part availability and production issues, similar to CNG. Once all necessary parts are on-site, either conversion (propane or CNG) can be completed in a couple of days.

In addition, conversations with KC Houlden (Permits Unit Supervisor) have been on-going regarding Construction Permit 00LR0746 language. Permit corrections are being applied to Construction Permit 00LR0746 that will allow for use of propane and CNG. The permit will be updated with appropriate language shortly, per KC Houlden on 07/29/2021 (see attachment 6.A).

In summary to the alleged violation in the Notification of Violation – Stack Test Memo, CRI has not exceeded the NOx 8.5 TPY limit as shown in Attachment 1.A – 1.F. In addition, CRI is investing in major changes to the fuel system which will result in cleaner emissions from the HMA plant. CRI formally requests the alleged finding of the NOx 8.5 TPY limit exceedance be nullified.

Please feel free to contact me with any questions.

Sincerely,

Brandon L. Martin
EHS Specialist

/Enclosures

CONNELL RESOURCES, INC. • 7785 HIGHLAND MEADOWS PARKWAY, SUITE 100 • FORT COLLINS, CO 80528-8988 • TEL (970) 223.3151 • FAX (970) 223.3191
CONNELL

Exhibit G

Ground Monitoring Plan

[see attached]

OLSON HARRIS LTD.

FOR TOWN OF WELLINGTON PLANNING COMMISSION

Connell Resources is in the planning stages of moving an asphalt mixing plant to an industrial parcel in Wellington, Colorado. This proposal outlines a groundwater monitoring plan for this future site.

OVERVIEW

Connell Resources is pleased to prepare this proposal for a groundwater monitoring program at the future site in Wellington. The purpose of this groundwater monitoring program is to get a baseline for groundwater quality and identify potential contamination areas, if any, prior to beginning mobilization and disturbance.

Basic Plan Components

Prior to disturbance by Connell Resources, two groundwater monitoring wells will be installed. An environmental consultant will be hired to assist in identifying the best on-site placement of the monitoring wells and registering the monitoring wells with the State Engineering Office.

- **Initial groundwater samples will be analyzed for metals, semi-volatile organic compounds (SVOCs) and volatile organic compounds (VOCs) from both well points per the Colorado Discharge Permit System Short-Term Construction Dewatering Application.**
- **The results from initial sampling will be reviewed by Connell Resources and an environmental consultant to determine groundwater quality.**
- **Annual testing will occur from both well points for benzene, toluene, ethylbenzene, and xylene (BTEX) at a minimum, assuming no parameters of concern were identified during initial sampling.**
- **Every 5 years, both well points will be resampled for metals, SVOCs, and VOCs.**
- **Records and test results will be available to the Town of Wellington upon request with reasonable notice.**

Exhibit H

NAPA and ATSDR studies

[see attached]

SANBORN HEAD

Building Trust. Engineering Success.

EMISSIONS COMPARISON: ASPHALT PAVEMENT MIXTURE PLANTS AND SELECT SOURCE CATEGORIES

Prepared for the National Asphalt Pavement Association
File No. 4197.02
December 2018

SANBORN, HEAD & ASSOCIATES, INC.

www.sanbornhead.com

TABLE OF CONTENTS

1.0 INTRODUCTION AND SUMMARY 2

2.0 EMISSION ESTIMATES 3

3.0 NEW EMISSION COMPARISONS 9

4.0 EXPOSURE COMPARISONS FOR PARTICULATE MATTER, FORMALDEHYDE, PAHS AND BENZENE 10

5.0 REFERENCES AND BIBLIOGRAPHY 16

List of Tables

Table 1 Summary Update to Emission Estimates
Table 2 Asphalt Pavement Mixture (APM) Plant Emission Estimates and Comparison with Previous Estimates
Table 3 Residential Fireplace Emission Estimates
Table 4 Residential Wood Stove Emission Estimates
Table 5 Bakery Emission Estimates
Table 6 Barbeque Emission Estimates
Table 7 Lawn Mower Emission Estimates
Table 8a Auto Refueling Emission Estimates — Revised
Table 8b Auto Refueling Emission Estimates — Original
Table 9a Fast Food Restaurant Emission Estimates — Original
Table 9b Fast Food Restaurant Emission Estimates — Alternative
Table 10 Brewery Emission Estimates
Table 11 Emission Comparison Summary

List of Abbreviations

APM	Asphalt Pavement Mixture
AQIA	Air Quality Impact Assessment
CHIEF	EPA Clearinghouse for Inventories and Emission Factors
CO	Carbon Monoxide
EPA	U.S. Environmental Protection Agency
NAPA	National Asphalt Pavement Association
NHEXAS	National Human Exposure Assessment Survey
NO_x	Nitrogen Oxides
NYSERDA	New York State Research and Development Authority
PAH	Polycyclic Aromatic Hydrocarbons
PM	Particulate Matter
SO_x	Sulfur Oxides
THC	Total Hydrocarbons
VOC	Volatile Organic Compounds

1.0 INTRODUCTION AND SUMMARY

The purpose of this report is to evaluate emissions and air quality impacts from asphalt pavement mixture (APM) plants, providing comparisons to other sources of air pollutant emissions commonly found in both urban and rural areas. The report updates and expands preceding work. In September 2001, Clayton Group Services (Clayton) released a study sponsored by the National Asphalt Pavement Association (NAPA) that compared air emissions from a continuous drum APM plant (having an annual production of 200,000 tons) to air emissions emitted from seven common source categories: residential fireplaces, residential wood stoves, bakeries, gasoline filling stations, barbeque grills, lawn mowers, and fast-food restaurants. Following their study, Clayton summarized their findings in a document titled "Emission Comparison: Continuous Drum Asphalt Plant and Selected Source Categories" (The Clayton Report), which used available emission factors, combined with available activity data to calculate emission estimates from an APM plant and each source category. Using these emission estimates, Clayton quantified the impacts of an APM plant by comparing the APM plant emission estimations to the number of sources in each category that had comparable calculated emissions (*i.e*, 13 residential fireplaces, 12 gas filling stations, *etc.*).

To obtain emission factor data, Clayton conducted searches through the U.S. Environmental Protection Agency's (EPA) AP-42 emission factor data, as well as related references. Where U.S. EPA data did not exist, Clayton performed searches into peer reviewed literature, journal articles, and state-sponsored emission studies. Clayton recognized that sources outside of the U.S. EPA were potentially not as reliable; however, they were still useful to provide adequate data to perform emission estimation calculations and comparisons.

The Clayton Report was developed as a tool to help interpret the magnitude of emissions from a typical APM plant, with a goal of developing information to assist in community-based discussions on local environmental issues. As such, the document has been a reliable reference since its publication in 2001.

In September 2017, Sanborn, Head & Associates Inc. (Sanborn Head), at the request of NAPA, performed a review of the Clayton report. We reviewed the report for accuracy and provided any updates and/or corrections that had occurred since its original issuance in September 2001. Throughout our review, we found that some updated emission factor data had become available in the past 15 years as there had been a push to make sources "cleaner" and reduce pollutant emission rates from many sources. Additionally, since 2001, more source categories had been introduced into communities as interest had expanded into different consumer products. While most, if not all, of the source categories investigated in 2001 are still common sources, and are still useful in comparison studies, there are several "new" source categories that are of interest today. We found that with the addition of new source categories there came an increase of air emissions and possibly "new" pollutants that were not investigated in 2001. We compiled our information in 2017 and built upon the original Clayton report, updating previous data as appropriate and adding a new source category (breweries) for comparison. Table 1 provides a summary of the changes to emission factors and comparisons. We also added a section on air quality impacts from APM plants and exposure comparisons to key pollutants associated with APM plants. These new sections are

intended to provide better perspective on potential exposure to pollutants released from APM plants. This report thus serves as an update and expansion of the Clayton Report. The following sections will describe our review of the methodology of the Clayton Report and our approach to updating or improving assumptions and calculations.

2.0 EMISSION ESTIMATES

The emission comparison methodology involves several steps. First, emissions are evaluated from a "typical" APM plant. Other common candidate source categories that emit similar pollutants to APM plants are considered and literature searches conducted to identify emission factors and activity data. Finally, the emission factors and activity data for each category are used to determine annual emissions for comparison to emissions from a typical APM plant. In deriving annual emission estimates for each source category, an attempt is made to develop the number of the sources similar to the emission levels from a typical APM plant. That approach in essence showed the number of sources in each category that would have emissions comparable to emissions from an asphalt plant (for example: 20 residential fireplaces, two gas filling stations, three fast-food restaurants).

To acquire data for the analysis, information searches included the U.S. EPA's Clearinghouse for Inventories and Emission Factors (CHIEF) on the U.S. EPA Technology Transfer Network, U.S. EPA's home page information sources function, California South Coast Air Quality Management District home page information sources function, and the U.S. EPA Research Triangle Park library. Where possible, U.S. EPA references are used (such as AP-42 document sections, Locating & Estimating documents, and other laboratory research reports) to enhance the uniformity and credibility of the results. These references tend to base emission estimates on a larger data set than would a journal article or a government-sponsored emissions study.

Emission estimates were determined for each source category by combining emission factors with reasonably available activity data (throughput, consumption, *etc.*). With one exception, emission factors for the various source categories were obtained from U.S. EPA publications and were based on multiple source measurements. The one exception is the selected emission factor for fast food restaurants, which came from a peer-reviewed journal and was based on data from one source test.

In conducting the updated report, we found that most of the U.S. EPA's emission factors used in the Clayton Report remain valid, though the U.S. EPA has made minor updates to numerous emission factors for continuous drum APM plants. References cited by Clayton were investigated to evaluate any updates and/or additions that may have been made since 2001. We were able to find most of the original referenced documents and validate the data used in the Clayton Report, and noted that very few of the original documents had been updated. Therefore, we performed a further investigation to determine whether any additional literature reviews or government sponsored emission studies were available that published reliable emission factor information. Relevant data were found for fast food restaurants and auto refueling. All updates and/or changes are reflected in source-specific report sections and tables.

We expanded three parts of the original investigation: 1) we considered additional source categories not evaluated in the original report; 2) we considered additional pollutants that may not have been thoroughly investigated or compared against in the original report; and 3) we conducted a screening level air quality impact assessment to evaluate the potential exposure of pollutants from an APM plant relative to typical indoor and outdoor background air quality (see Section 4.0). As a result, we added breweries as a new source to investigate as they have recently become very popular in communities and are operated and frequented throughout all seasons. Of the additional pollutants we investigated, formaldehyde was of increased interest as it has recently garnered a lot of attention from the U.S. EPA and is now a common pollutant to investigate when performing air emission evaluations. PAHs were investigated to further understand any additional impacts that they may have in a community. With these additions, additional emission estimate calculations were performed and compared to the calculated emission estimates of an APM plant.

Asphalt Pavement Mixture Plants

The Clayton Report referenced a draft AP-42 Section 11.1 for APM plants, but U.S. EPA (2004) had finalized the section by the September 2001 report date. As such, the final Clayton Report did not account for some changes in the final AP-42 Section 11.1 for APM plants. Upon review, small adjustments were necessary in the overall emission table for APM plants, and these changes are reflected in Table 1 of this updated report. Also, in late 2000, the U.S. EPA published an *Emission Assessment Report* for Hot-Mix Asphalt Plants to help characterize the emissions from the production of APM. The report included emission factor tables for an oil-fired drum mix plant, and broke emissions into two categories; drier stack emissions and several types of fugitive emissions. While the Clayton Report did not reference the U.S. EPA's Assessment Report, there was an attempt to implement the U.S. EPA's method of including fugitive emissions in the calculations for the criteria pollutants. It appears only dryer stack emissions were considered in the calculations for all other pollutants listed in the report. Evaluating the information provided by the U.S. EPA and comparing it to the information from the Clayton Report, it is clear that in most situations, the addition of the fugitive emissions does not have a large impact on the overall calculated emissions. In some cases, however, the fugitive emissions play a greater role and increase the overall calculated emission by factors of two or more.

For simplicity and consistency, we adopted the emission estimates developed by the U.S. EPA (2000) in characterizing a typical APM plant. Table 2 provides the updated APM plant emissions, and also provides overall (stack plus fugitive) emission comparisons with the original Clayton Report. The ratios of U.S. EPA: Clayton emissions reflect the degree of similarity or difference between the two sources. Many of the ratios are near unity, indicating no significant difference or change between the finalized U.S. EPA *Emission Assessment Report* and the Clayton Report. Ratios for some pollutants, however, differ substantially from one another. For a few pollutants, notably particulate matter (PM) and benzene, ratios less than one indicate that emissions in the U.S. EPA *Emission Assessment Report* are lower than those assumed in the Clayton Report. For pollutants such as toluene and most PAHs, however, the Clayton Report assumed lower emissions than presented in the U.S. EPA *Emission Assessment Report*.

We conducted a similar review and update of emission estimates for the other source categories APM plants are compared against. The text and information presented in many of the following sections came directly from the original Clayton Report, but we edited or expanded based upon new information. Additionally, a section for breweries was added due to an increase of information and relevancy found in our research.

For simplicity, use of Clayton in the following sections refers to the work of the original 2001 emissions comparison report.

Residential Fireplaces

Clayton used the AP-42 emission factor for residential fireplaces to calculate emissions from residential fireplaces and assumed an average wood use per household from a U.S. EPA-sponsored wood stove study from November 1987. We reviewed the AP-42 emission factors referenced, and agree with both the emission factor, and the assumption made on wood use, as we found no updates since 2001. However, we did make one correction in the emission factor table issued by Clayton. The PM_{10} emissions for 13 households presented by Clayton were incorrect by a factor of ten. The calculated emissions are 0.485 tons/yr based on the emission factor used. Table 3 provides a compilation of the emission estimates for residential fireplaces. Using the most recent emission estimates for a typical APM plant, we found that the corrected emission estimation comparison between an APM plant and the number of households with fireplaces should be 20, based on the revised VOC emission total for an APM plant from the U.S. EPA *Emission Assessment Report*.

We added emission comparisons for two additional pollutants to Table 3 using information from the literature we identified in 2017, which supplements U.S. EPA AP-42 data. Li (2007) reports a formaldehyde emission factor of 1.94 lb/ton wood for wood stoves (which we judge equally applicable to fireplaces). Additionally, we use an arsenic mass fraction of 6.6 mg/kg measured in wood ash (NYSERDA, 2013) in combination with the PM emission factor of 34.6 lb/ton wood to derive an arsenic emission factor of 0.000228 lb/ton wood.

Residential Wood Stoves

Similar to the references and assumptions made for emissions from a fireplace, Clayton used the same wood use per household and the appropriate AP-42 emission factor to calculate emissions from residential wood stoves. We confirm and agree with the assumptions made as the emission factors have not been updated since 2001, and we were not able to find any additional research regarding annual household wood usage. We did, however, find discussion of the improvements made on wood stoves in the past 15 years. New residential wood stoves likely release substantially less particulate matter (and possibly other pollutants) than reflected in the current AP-42 emission factors.

Notwithstanding, there have been no recent updates to AP-42, and the use of emission factors from non-catalytic wood stoves to calculate emissions for criteria pollutants, PAHs, and metals, combined with the use of emission factors from conventional wood stoves to

calculate emissions from organic pollutants, is still relevant when comparing emissions from residential wood stoves to an APM plant. Table 4 summarizes the emission factors and calculations for residential wood stoves. We added an available TOC emission factor and set the number of households in Table 4 to 19 to match emissions of benzene to those of an APM plant.

We also performed additional research to enhance the credibility of results. For example, we found a 2007 Canadian study of five conventional wood stoves citing emission factors of particulate matter (PM) and carbon monoxide (CO) similar in magnitude to the published AP-42 values. Specifically, Li (2007) found average PM and CO emission factors of 17.8 lb/ton and 204.8 lb/ton, respectively, which are quite comparable to the AP-42 emission factors of 19.6 lb/ton (PM) and 140.8 lb/ton (CO). The mean benzene emission factor of 1.660 lb/ton measured by Li (2007) is also similar to the 1.938 lb/ton AP-42 emission factor.

Emission comparisons were added to Table 4 for two additional pollutants using information from the literature to supplement AP-42 data. Li (2007) reports a formaldehyde emission factor of 1.94 lb/ton wood. Additionally, we used an arsenic mass fraction of 6.6 mg/kg measured in wood ash (NYSERDA, 2013) in combination with the PM emission factor of 19.6 lb/ton wood to derive an arsenic emission factor of 0.000129 lb/ton wood.

One caveat on both the Li (2007) study and the AP-42 emission factors is that they reflect data from older vintage wood stoves. The average measured PM emission rate in the Li (2007) study of 21 g/hr is considerably greater than the 4.5 g/hr limit that U.S. EPA set for certification on stoves sold after May 15, 2015 (U.S. EPA, 2015). Even prior to this compliance date, most wood heaters on the market were capable of meeting the 4.5 g/hr limit, based on test certification data collected after U.S. EPA established initial New Source Performance Standards (NSPS) in 1988 (U.S EPA, 2017a).).

Examining the PM emission factors from AP-42 and the Li (2007) study in contrast with the NSPS and certification data, we believe that AP-42 emission factors for wood stoves may overestimate PM emissions for most wood stoves sold in the past few decades. We thus advise caution in the use of emissions comparisons between wood stoves and asphalt pavement mixture plants with respect to PM. We are not aware of emissions data on other pollutants that can be used to evaluate the relevancy of AP-42 emission factors to current and recent wood stove models, though conjecturally, one would expect trends for PM-associated pollutants such as PAHs and arsenic to be similarly lower than in AP-42, assuming that the composition of particles generated during combustion is similar in old and new stoves.

Bakeries

Clayton developed an emission estimation comparison between an APM plant and one medium sized commercial bakery (based on annual bread production). The annual production of bread used in the calculations was 17,308 tons of bread baked per year and the emission factor was obtained from an AP-42 support document. We confirm the accuracy of the approach that was taken in the bakery comparison and agree that the emission

calculation is a conservative estimation of the VOC emissions derived from bread baking at one medium sized bread bakery. Table 5 summarizes the calculations. We caution, though, that comparisons with bakery emissions be made with clarity. The medium-sized bakery considered in the calculations is sizable and representative of a commercial enterprise that produces about 95,000 pounds of bread per day, which is considerably larger than a typical neighborhood bakery.

Barbeque Grills

Clayton's TOC emission factor for barbeque grills was obtained from a non-U.S. EPA document that we reviewed and remains valid today. We performed additional investigation to find a more relevant emission factor, but nothing applicable was found. Table 6 summarizes the emission calculations for barbecue grilling, which are based on a grill cooking time of 30 minutes and use of the grill 20 times per year. Using these two assumptions, TOC emissions from an APM plant are comparable to 336 households using barbeque grills.

Lawn Mowers

The lawn mowers used in the Clayton emission estimation are 2-stroke, gasoline powered mowers. The emission factors were obtained from a document titled "Emission Study Report for Non-Road Engines and Vehicles" (U.S. EPA, 1991) and are expressed as gram of pollutant per horsepower-hour (g/hp-hr). We concur with the reasonableness of the assumptions made in the Clayton Report regarding approximate hours of operation per year (50 hours) and the use of horsepower rating at 30% load. Emission calculations are summarized in Table 7 and are presented for 211 lawnmowers to match the emissions of TOC from a typical APM plant. We added additional emission factors for CO, NO_x, and SO_x to Table 7 (also obtained from the U.S. EPA (1991) document).

However, an important caveat regarding the calculations for lawn mowers is the lessening relevance of the emission factors. The U.S. EPA developed stringent emission limits for nonroad engines that have been phased in over time such that new lawn mowers now release roughly 50 times lower hydrocarbons, two times lower CO, and 30–100 times lower PM than the models considered by Clayton at the time of the original report. Even allowing for the gradual replacement of old lawn mowers with new ones, aggregate emissions from lawn mowers have likely decreased substantially, making the emissions comparisons for TOC and PM much less relevant than in the past. As CO emissions have only dropped by a factor of 2, the Clayton Report's comparisons for aldehydes (another product of incomplete combustion) likely remain of greater contemporary relevance.

Auto Refueling

Upon review of the Clayton Report section on auto refueling, we identified more recent information from the U.S. EPA (2008) to update emission estimates. AP-42 section 5.2, issued in June 2008, provided estimates of VOC emissions from auto refueling in its Table 5.2-7. Assuming typical Stage 1 and Stage 2 controls, VOC emissions from (i) filling the

underground storage tank, (ii) breathing and emptying of the underground tank, (iii) vehicle refueling, and (iv) spillage total 372 mg/l. Assuming the same throughput of 50,000 gal/month, we added a total VOC emission estimate equal to:

$$\text{VOC emissions} = \left(\frac{372\text{ mg}}{\text{l}}\right)\left(\frac{3.7854\text{ l}}{\text{gal}}\right)\left(\frac{50000\text{ gal}}{\text{mo}}\right)\left(\frac{12\text{ mo}}{\text{yr}}\right)\left(\frac{\text{lb}}{453600\text{ mg}}\right)\left(\frac{\text{ton}}{2000\text{ lb}}\right) = 0.93\ \frac{\text{ton}}{\text{yr}}$$

AP-42 section 5.2 states that TOC emissions are essentially the same as VOC emissions.

Recent measurements of the composition of gasoline vapors (Chin & Batterman, 2012) indicate that gasoline vapors contain 5.4% benzene, 13.5% toluene, 2.7% ethylbenzene, and 12.0% xylenes (by mass). Multiplying these percentages by the total VOC emissions estimate yields annual emissions estimates of 0.05 tons benzene, 0.13 tons toluene, 0.025 tons ethylbenzene, and 0.11 tons xylenes from a typical filling station (summarized in Table 8a).

The original emission estimates for auto refueling (filling stations) are reproduced in Table 8b based on the methodologies in the Clayton (2001) report. Table 8a estimates have been labeled as revised based on the dependence on more recent data. However, the revised estimates also depend on two sources of data, introducing some additional uncertainty. Hence, the original emission estimates in Table 8b remain valuable for comparison in gauging the level of uncertainty.

Fast Food Restaurants

Clayton constructed emissions estimates for fast food restaurants based on a published paper on emissions from meat cooking (Rogge *et al.*, 1991) and interviews of a local fast-food restaurant chain to determine an average annual meat consumption. In our review, we found emission factors from fast food restaurants were difficult to quantify as there were not a lot of available or consistent data on emission factors and emission estimation calculations. The restaurant chain Clayton contacted owned eight (8) franchise restaurants. The emission factors referenced were for TOC and various PAHs. As a result, Clayton calculated emission estimations based off an approximation of pounds of hamburger cooked in a week. We verified the calculations based on the assumptions made in this approach, and the calculations of emissions are summarized in Table 9a. We also did additional research into available fast food restaurant data. We found a document published by the U.S. EPA (Lee, 1999) that quantified emissions from Street Vendor Cooking Devices (charcoal grilling) in Mexico. The study measured levels of PM, VOCs, aldehydes, CO, NO_x, THC, and other pollutants. The study concluded that emissions of PM and organic pollutants were the result of cooking meat (charcoal did not contribute to the emissions). Using the emission factors listed in the Lee (1999) study we performed alternative calculations for comparison against the original Clayton estimates. Table 9b presents calculations based on the alternative emission factors. Despite originating from a study of charcoal cooking (in a less controlled cooking environment), the TOC and total PAH emission factors that overlap with Table 9a are within a factor of 2 of the original estimates (though 60–80% higher). Allowing for some potential overestimation by the alternative emission factor method in Table 9b, the new

estimates afford emission factors for additional pollutants not available in the original Table 9a estimates.

It is important to note that the estimations in Tables 9a and 9b may be inaccurate for at least three reasons: 1) only hamburger was considered when performing emission calculation estimations; 2) there were no control devices considered when performing these calculations; and 3) neither set of measurements from meat cooking was collected from fast food restaurant style cooking. Many restaurants may employ some sort of control (besides venting) as well as have additional food items listed on their menu. Also, the assumed amount of hamburger in the calculations may be overestimated, but this compensates for the lack of consideration of a diversified menu.[1] Based on these factors, we view the two sets of estimates as providing some information on the degree of uncertainty inherent in the calculations.

3.0 NEW EMISSION COMPARISONS

Clayton developed a comparison of air pollution emissions for various source categories based on specific pollutants or groups of pollutants. The pollutants that Clayton used for comparison include the following: TOCs, VOCs, PM, toluene, benzene, PAHs, benzo[*b*]fluoranthene, benzo[*a*]pyrene, fluoranthene, and pyrene. We added some additional pollutants to this list, as reflected in Tables 3 though 9b. We also developed an additional source category (breweries), described as follows.

Breweries

As beer brewing has become an increasingly popular endeavor, more literature and documentation have become available on emissions generated at both large- and small-scale brewing operations. In 1996, the U.S. EPA published VOC emission factors emitted during different parts of the beer brewing process. The U.S. EPA listed the numerous VOC emission sources during the beer brewing process, including but not limited to the following: mash tuns, cereal cookers, brew kettles, hot wort settling tanks, yeast storage, fermenters, grain holding tanks, and packaging operations. To obtain an overall VOC emission factor for comparison to APM plants, we added the emission factors for all the processes into one emission factor totaling 44.4 lb/1000 bbl for small-scale breweries (producing less than 60,000 barrels of beer (bbl) annually).[2] Using the VOC emission factor, we calculated emission estimations for small-scale breweries and compared those to the VOC emissions from an APM plant. We discovered that the annual VOCs from an APM plant are comparable to about four small-scale commercial breweries (assuming an annual production of 60,000 barrels of beer). In making a comparison, a small commercial brewery would emit about

[1] The Clayton Report assumes that a fast food restaurant cooks 146,692 lbs of meat (hamburger) per year. As another estimate on the amount of "meat" processed, there are reported to be 14,146 McDonald's restaurants in the U.S. (Statista, 2017)) and these restaurants use one billion lbs/yr of beef (Lubin & Badkar, 2011). So the amount of beef used by the average restaurant is 1,000,000,000 lbs / 14,146 = 70,691 lb/yr, which is about half the amount assumed in the Clayton Report. But there has been no accounting for the cooking of anything else on the menu, so the Clayton estimate might be reasonable for total food cooked.

[2] It should be noted that the definition of a "small" brewery varies widely among different trade groups, but the U.S. EPA threshold of 60,000 bbl is used in this report.

27% of the VOCs released by an APM plant (assuming the brewery produced 60,000 bbl/yr). Calculations for the brewery source category are included in Table 10.

Emissions Summary

Table 11 summarizes emission comparisons for various pollutants released from APM plants and the different selected source categories that were investigated. The table includes all the pollutants from the Clayton report and three that we added (arsenic, ethylbenzene, and toluene). As previously discussed, we have also included the "Fast Food Restaurant — Alternative" and "Gasoline Filling Stations — Revised" source categories that use different approaches to estimating emissions. In these cases, differences from the original estimates based on the Clayton (2001) methodologies are mostly thought to reflect uncertainty in the emission estimates.

4.0 EXPOSURE COMPARISONS FOR PARTICULATE MATTER, FORMALDEHYDE, PAHS AND BENZENE

Pollutant emissions that impact people to the greatest degree often occur indoors and outdoors near ground level. In both cases, dilution/dispersion processes are limited, and exposure levels can be elevated relative to other pollution sources. Several examples of typical, elevated exposures to pollutants are presented based on published measurements and information. Typical air pollutant concentrations that result under common conditions are compared to the concentrations of pollutants likely to result from emissions from a typical APM plant.

We extended emission comparisons to examine relative *exposures* to particulate matter, formaldehyde, polycyclic aromatic hydrocarbons (PAHs), and benzene, as these contaminants are commonly found in the indoor air of homes due to indoor emission sources. Particulate matter is released from many sources including household dust, cooking, and wood burning in fireplaces and wood stoves. Formaldehyde is a common component of resins used in building products such as pressed board, and off-gassing from new construction can lead to indoor air concentrations 10–100 times above typical outdoor levels. PAHs are a product of incomplete combustion and are emitted indoors through the use of wood burning stoves and cook stoves (gas or electric). Benzene is present in gasoline, and homes with attached garages have been found to have concentrations elevated above outdoor levels. All of these chemicals are also found in cigarette smoke and in the byproducts of combustion sources (such as cooking and heating sources, burning candles, *etc.*).

Screening Level Air Quality Impact Assessment

A screening-level air quality impact assessment (AQIA) was conducted to estimate worst-case air quality impacts of particulate matter, formaldehyde, PAHs, and benzene from a typical APM plant. Projected air quality impacts serve as a better estimate of air pollutant exposure than simple quantification of emissions. Although site-specific conditions for an individual APM plant may differ from the assumptions used in our analysis, the conservative assumptions built into screening-level methods tend to overestimate (bias high) projected

air quality impacts. Thus, the results are generally applicable as a conservative estimate of exposure to pollutants within close proximity to an APM plant.

Air toxics emissions data for APM plants are obtained from the U.S. EPA (2000) *Emission Assessment Report*. The emission estimates are based on a typical drum mix plant fired by natural gas producing 200,000 tons of APM per year. Emissions from loadout, yard activities, asphalt cement storage tank venting, and APM silo venting are combined as fugitive emissions. Fugitive emissions, by dint of elevated temperatures and distributed from various points, are assumed to be spread through volume source 40 feet in height and length and 150 feet in width, with an average release height of 20 feet.

Screening-level dispersion modeling using the U.S. EPA SCREEN3 model (as implemented in the Lakes Environmental (2017) SCREEN View freeware) is used to estimate worst-case 1-hour average impacts of these four air pollutants. Ground-level air quality impacts are estimated at a location 1,000 feet from the dryer stack, unless indicated otherwise. Drier stack emissions are modeled as a point source using the following parameters for a typical APM plant, as culled from stack test reports and communications with equipment vendors:

- A drier stack height of 30 feet, adjacent to a baghouse approximately 12 feet wide, 70 feet long, and 27 feet high; and
- A stack diameter of 4 feet, with effluent at a temperature of 240°F and velocity of 57 fps (feet per second).

Exposure Comparisons

Results of the air quality impact assessment were compared to average U.S. background concentrations predicted in the 2011 National Air Toxics Assessment (U.S. EPA, 2017b) and expected indoor air quality to determine the relative impact that emissions from an APM plant have on the surrounding community. The results for particulate matter, formaldehyde, PAHs, and benzene are presented below.

Particulate matter (PM) is regulated by U.S. EPA based on the particle size based on the knowledge that particles smaller than 10 µm aerodynamic diameter (PM_{10}) are "respirable" and penetrate deep into the respiratory tract, and particles smaller than 2.5 µm ($PM_{2.5}$) can reach the alveoli (air sacs) where oxygen and carbon dioxide exchange with the blood occurs. Various studies indicate greater concern over the potential adverse health effects of $PM_{2.5}$ in ambient air.

To evaluate the potential particulate matter impacts of APM plant emissions, we consider releases of PM_{10}, which both includes and overestimates $PM_{2.5}$. The screening-level air dispersion modeling predicts a PM increase of 0.3 µg/m^3 in ambient air due to APM plant emissions at a distance of 1,000 feet from the dryer stack. This represents a 4% increment to the average level of $PM_{2.5}$ of 8 µg/m^3 present in ambient air in the United States.[3] In the absence of indoor sources, PM levels in homes and offices tend to be lower than outdoor

[3] EPA's on-line air trends report (U.S. EPA, 2017c)indicates an average $PM_{2.5}$ concentration of 7.8 µg/m^3 in the U.S. in 2016 (which rounds to 8 µg/m^3).

levels. However, certain sources, such as cigarette smoking and cooking, lead to higher levels. As an example, a recent study of homes heated by wood stoves found an average $PM_{2.5}$ level of 29 µg/m³ in indoor air (Semmens *et al.*, 2015). Figure 1 compares these values.

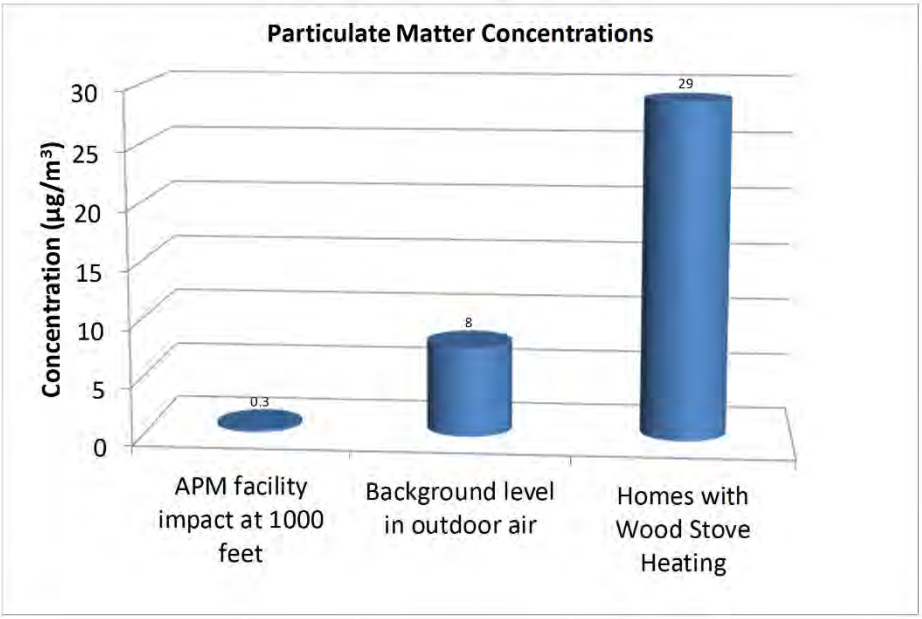


Figure 1 Comparison of sources of exposure to particulate matter

The subsequent chart (Figure 2) compares the formaldehyde concentrations that result from a typical APM facility, the background level in the United States, and the typical indoor concentration for conventional homes. The modeled formaldehyde impact at 1,000 feet from a 200,000 ton/year gas-fired drum mix APM plant (a typical size) is on the order of 0.1 µg/m³, while the typical background level measured in the United States is approximately 1.5 µg/m³. Based on a 2007 indoor air survey conducted in the United States, the 50th percentile formaldehyde concentration measured in the 234 homes was 20 µg/m³, which is approximately 200 times the impact from a typical APM (Liu *et al.*, 2007).

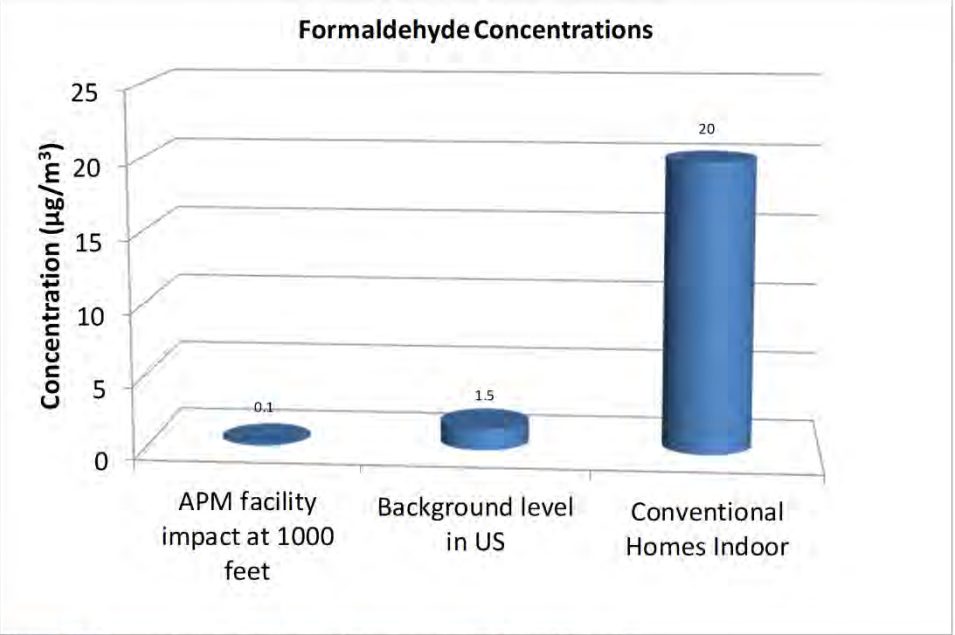


Figure 2 Comparison of sources of exposure to formaldehyde

Indoor air is also commonly contaminated by PAHs, which come not only from infiltration or intrusion of outdoor air but also from indoor emission sources such as cooking and domestic heating with fuel stoves and open fireplaces. Even in airtight stoves with a flue, elevated indoor levels of PAHs can result from intrusion of outdoor air and/or leakage from wood-burning appliances.

The following chart (Figure 3) compares the PAH concentrations from a typical APM facility to outdoor and indoor air concentrations in urban areas across the United States. Concentrations are expressed as benzo[*a*]pyrene equivalents. The modeled range of PAH impacts, 0.00009–0.0003 µg/m^3, represents distances of 250 and 3,000 feet from the typical 200,000 ton/year natural gas fired drum mix APM facility. Based on two studies that measured outdoor and indoor air quality at ten Chicago area homes and 55 residences in Los Angeles, California, Houston, Texas, and Elizabeth, New Jersey, the measured PAH concentrations ranged from 4 to 180 ng/m^3 in outdoor air and from 2 to 350 ng/m^3 in indoor air, which is approximately 10 to 2,000 times the impact from a typical APM (Li *et al.*, 2005; Naumova *et al.*, 2002).

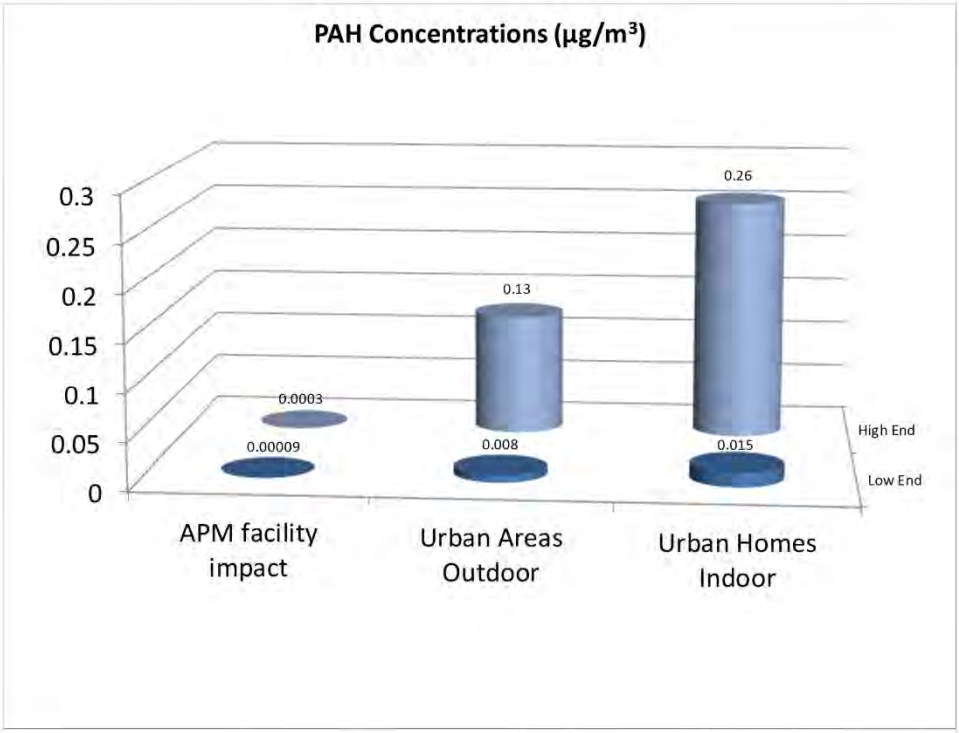


Figure 3 Comparison of sources of exposure to polycyclic aromatic hydrocarbons (PAHs)

The following chart (Figure 4) compares the benzene concentrations from a typical APM facility to outdoor and indoor air concentrations in areas across the United States. Concentrations are expressed as benzo[*a*]pyrene equivalents. The modeled range of PAH impacts, 0.005–0.02 µg/m³, represents distances of 250 and 3,000 feet from the typical 200,000 ton/year natural gas fired drum mix APM facility. The outdoor concentrations are the highest and lowest statewide averages from the U.S. EPA National Air Toxics Assessment (NATA) study, which range from 0.3 µg/m³ (Montana) to 1.4 µg/m³ (District of Columbia). Benzene concentrations in outdoor air vary with proximity to roads and traffic density — a study in New York City measured an average concentration of 0.6 µg/m³ in a low traffic area, and an average of 1.3 µg/m³ in a high traffic area (NYC Health, 2011) The National Human Exposure Assessment Survey (NHEXAS) found higher concentrations of benzene indoors than outdoor, with the median and 90th percentile indoor air concentrations measured at 1.7 µg/m³ and 18.1 µg/m³, respectively, in homes in Arizona (Robertson *et al.*, 1999) Concentrations of benzene encountered in specific microenvironments, such as gasoline filling stations, can be even higher.

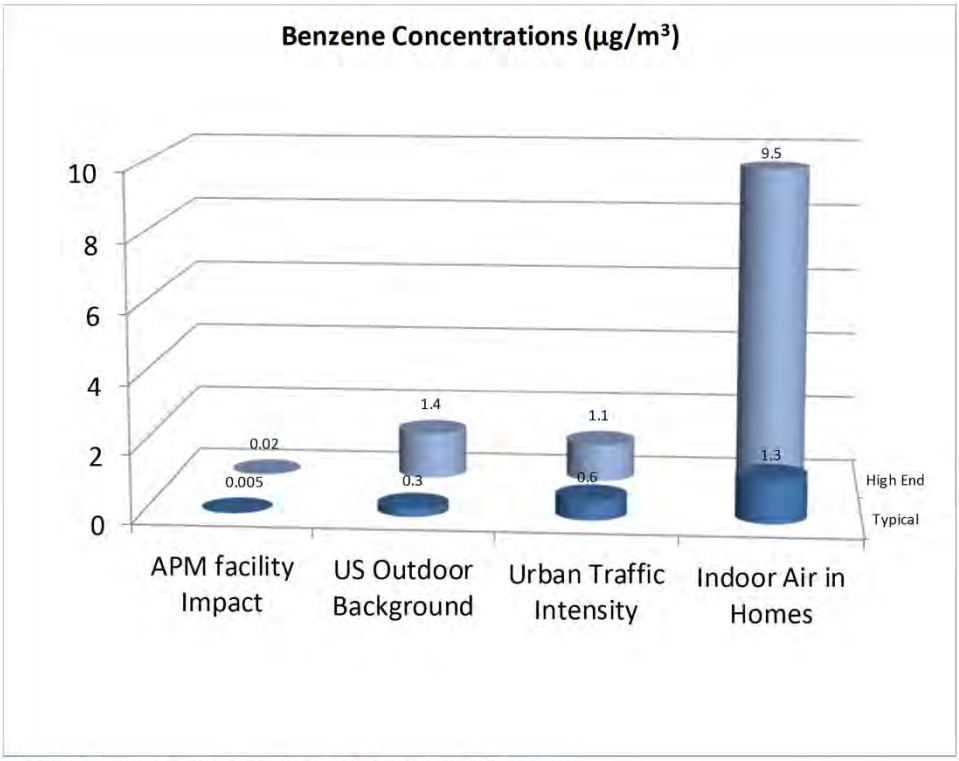


Figure 4 Comparison of sources of exposure to benzene

The overall commonalities of the comparisons of Figure 1 through Figure 4 are that the incremental concentrations of pollutants added by emissions of an APM facility are small compared to the levels typically present in outdoor air due to other sources, and that exposure levels indoors (where people spend the bulk of their time) can be many times greater and account for the majority of air pollutant exposure.

5.0 REFERENCES AND BIBLIOGRAPHY

Banks, J.L., & McConnell, R. (n.d.). *National Emissions from Lawn and Garden Equipment.* Lincoln, MA: Quietcommunities.org.

Bluewater Network. (2002). *Snowmobile Position Paper.* Bluewater Network.

Burnet, P. (1988). *The Northeast Cooperative Woodstove Study.* Research Triangle Park, NC: U.S. Environmental Protection Agency.

Clayton Group Services. (2001). *Emissions Comparison: Continuous Drum Asphalt Plant and Selected Source Categories.* Lanham MD: National Asphalt Pavement Association.

E.H. Pechan & Associates Inc. (1993). *Emission Factor Documentation for AP-42 Section 1.9, Residential Fireplaces.* Research Triangle Park, NC: U.S. Environmental Protection Agency .

E.H. Pechan & Associates Inc. and U.S. EPA. (2004). *National Emissions Inventory for Commercial Cooking.*

Eastern Research Group. (1996). *Report on Revisions to 5th Edition AP-42, Section 1.10 Residential Wood Stoves.* Research Triangle Park, NC: U.S. Environmental Protection Agency.

Gordon, S., Callahan, P., Nishioka, M., Brinkman, M., O'Rourke, M., Lebowitz, M., & Moschandreas, D. (1999). Residential environmental measurements in the National Human Exposure Assessment Survey (NHEXAS) pilot study in Arizona: preliminary results for pesticides and VOCs. *Journal of Exposure Analysis & Environmental Epidemiology*, 9:456-470.

Hazlett, P., Hannam, K., Venier, L.. (2017, March 7). Wood ash recycling in forests: opportunities and challenges. *Bio-heat Community of Practice Workshop*. Sault Ste. Maire, Ontario, Canada: National Resources Canada — Canadien Forest Service.

Hodgson, A.T. (2015). *Formaldehyde Emissions from Flooring & Other Building Products: How to Test.* Richmond, CA: Berkeley Analytical Associates LLC.

Houck, J.E., Crouch, J., & Huntley, R.H. (2001). *Review of Wood Heater and Fireplace Emission Factors.*

Houck, J.E., Pitzman, L.Y., & Tiegs, P. (2008). *Emission Factors for New Certified Residential Wood Heaters.*

Kim, J.-A., Kim, S., & Kim, Y.-S. (2011). Evaluation of formaldehyde and VOCs emission factors from paints in a small chamber: The effects of preconditioning time and coating weight. *Journal of Hazardouz Materials*, 52-57.

Lakes Environmental (2017). Screen View — Freeware. https://www.weblakes.com/products/screen/index.html, accessed/downloaded September 2017.

Lee, S.Y. (1999). *Emissions from Street Vendor Cooking Devices (Charcoal Grilling).* Washington, D.C.: U.S. Environmental Protection Agency. EPA-600/R-99-048.

Li, A., Schoonover, T.M., Zou, Q., Norlock, F., Conroy, L.M., Scheff, P.A., and Wadden, R.A. (2005). Polycyclic aromatic hydrocarbons in residential air of ten Chicago homes: Concentrations and influencing factors. *Atmospheric Environment* **39**:3491-3501.

Li, V.S. (2007). *Conventional Woodstove Emission Factor Study.* Toronto, Ontario.

Liu, W., Zhang, J., Korn, L.R., Zhang, L., Weisel, C.P., Turpin, B., Morandi, M., Stock, T., and Colome, S. (2007). Predicting personal exposure to airborne carbonyls using residential measurements and time/activity data. *Atmos. Environ.* **41**:5280-5288.

Lubin, G., & M. Badkar (2011). 15 Facts About McDonald's That Will Blow Your Mind. *Business Insider*. https://www.businessinsider.com/facts-about-mcdonalds-blow-your-mind-2011-11/#ericans-alone-consume-one-billion-pounds-of-beef-at-mcdonalds-in-a-year-five-and-a-half-million-head-of-cattle-13, accessed September 2017.

Naumova, Y.Y., Eisenreich, S.J., Turpin, B.J., Weisel, C.P., Morandi, M.T., Colome, S.D., Totten, L.A., Stock, T.H., Winer, A.M., Alimokhtari, S., Kwon, J., Shendell, D., Jones, J., Maberti, S., and Wall, S.J. (2002). Polycyclic aromatic hydrocarbons in the indoor and outdoor and of three cities in the U.S. *Environ. Sci. Technol.*, **36(12)**: 2552–2559.

NYC Health (2011). New York City Community Air Survey: benzene, foamldehyde and other air toxic air pollutants in New York City. https://www1.nyc.gov/assets/doh/downloads/pdf/eode/air-survey-spring11.pdf, accessed September 2017.

NYSERDA (2013). Northeast States for Coordinated Air Use Management (NESCAUM). (2013). *Elemental Analysis of Wood Fuels.* Albany, NY: New York State Research and Development Authority (NYSERDA).

OMNI Consulting Services Inc. (2002). *Updated Emissions Data for Revision of AP-42 Section 1.9, Residential Fireplaces.* Research Triangle Park, NC: U.S. Environmental Protection Agency.

OMNI Environmental Services Inc. (1998). *Residential Wood Combustion Technology Review Volume 1, Technical Report.* Washington, D.C.: U.S. Environmental Protection Agency.

Pitman, R. (2006). Wood Ash use in Forestry, A Review of Environmental Impacts. *Forestry: An International Journal of Forest Research, Volume 79, Issue 5*, 563-588.

Radian (1990). Estimation of Emissions from Charcoal Lighter Fluid and Review of Alternatives. Prepared by Radian Corporation for U.S Environmental Protection Agency. PB90-186313.

Radian (1992). SIP Inventory Preparers and EPA Regions. *VOC Emissions from Breweries.*

Robertson, G.L, Lebowitz, M.D., O'Rourke, M.K, and Moschandreas, D. (1991). The National Human Exposure Assessment Survey (NHEXAS) study in Arizona — introduction and preliminary results. *J. Exp. Anal and Env. Epid.* **9(5)**:427-434.

Rogge, W.F. (1991). Sources of Fine Organic Aerosol. 1. Charbroilers and Meat Cooking Operations. *Environmental Science & Technology Vol. 25, No. 6*, 1112-1125.

RTI International. (2004). *Emission Factor Documentation for AP-42 Section 11.1, Hot Mix Asphalt Plants.* Research Triangle Park, NC: U.S. Environmental Protection Agency `.

Rudd, A., Hodgson, A., Beal , D., & Chandra, S. (2008). *Volatile Organic Compound Concentrations and Emission Rates in New Manufactured and Site-Built Houses.* Building Science Press.

Scheepers, G.P. (2014). *The effect of wood ash on the soil properties and nutrition and growth of Eucalyptus granid x urophylla grown on a sandy coastal soil in Zululand.* Stellenbosch University.

Semmens, E.O., Noonan, C.W., Allen, R.W., Weiler, E.C., and Ward, T.J. (2015). Indoor particulate matter in rural, wood stove heated homes. *Environmental Research* **138**:93-100.

Statista (2017). Number of McDonald's restaurants in North America from 2012 to 2017, by country. https://www.statista.com/statistics/256040/mcdonalds-restaurants-in-north-america/, accessed September 2017.

U.S. EPA (1987) P.G. Burnet, Northeast Cooperative Woodstove Study, Volume 1. Research Triangle Park, NC: Air and Research Lab. EPA/600/7-87-026a.

U.S. EPA. (1991a). *Locating and Estimating Air Emissions from Sources of Formaldehyde (Revised).* Research Triangle Park, NC: U.S. Environmental Protection Agency.

U.S. EPA. (1991b). *Nonroad Engine and Vehicle Emission Study .* Washington, DC: U.S. Environmental Protection Agency.

U.S. EPA. (1992). *Alternative Control Technology Document for Bakery Oven Emissions.* Research Triangle Park. EPA/453/R-92-017.

U.S. EPA. (1994a). *Locating and Estimating Air Emissions from Sources of Toluene.* Research Triangle Park, NC: U.S. Environmental Protection Agency.

U.S. EPA. (1994b). *Locating and Estimating Air Emissions from Sources of Xylene.* Research Triangle Park, NC: U.S. Environmental Protection Agency.

U.S. EPA. (1995). *Compilation of Air Pollutant Emission Factors: AP-42, 5th ed. plus supplements.* Retrieved from U.S. Environmental Protection Agency: https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emission-factors#5thed

U.S. EPA (1996a). AP42 Section 1.9, *Residential Fireplaces.* In U.S. EPA (1995).

U.S. EPA (1996b). AP42 Section 1.10, *Residential Wood Stoves* (1996). In U.S. EPA (1995).

U.S. EPA (1996c). AP42 Section 9.12.1, *Malt Beverages* (1996). In U.S. EPA (1995).

U.S. EPA. (1996d). Emission Factor Documentation for AP-42, Section 9.12.1, Malt Beverages, Final Report. Accessed August 2018 at: https://www3.epa.gov/ttn/chief/ap42/ch09/bgdocs/b9s12-1.pdf

U.S. EPA (1997). AP42 Section 9.9.6, *Bread Baking* (1997). In U.S. EPA (1995).

U.S. EPA. (1998a). *Locating and Estimating Air Emissions from Sources of Benzene.* Research Triangle Park, NC: U.S. Environmental Protection Agency.

U.S. EPA. (1998b). *Locating and Estimating Air Emissions from Sources of Arsenic and Arsenic Compounds.* Research Triangle Park, NC: U.S. Environmental Protection Agency.

U.S. EPA. (2000). *Hot Mix Asphalt Plants: Emission Assessment Report.* Research Triangle Park, NC: U.S. Environmental Protection Agency. EPA 454/R-00-019.

U.S. EPA. (2002). *Exhaust and Crankcase Emission Factors.* U.S. Environmental Protection Agency.

U.S. EPA (2004). AP42 Section 11.1, *Hot Mix Asphalt Plants.* In U.S. EPA (1995).

U.S. EPA (2008). AP42 Section 5.2, *Transportation and Marketing of Petroleum Liquids.* In U.S. EPA (1995).

U.S. EPA. (2010). *Exhaust Emission Factors for Nonroad Engine Modeling — Spark Ignition.* U.S. Environmental Protection Agency.

U.S. EPA. (2011 Edition (Final Report).). *Exposure Factors Handbook.* Washington, D.C. EPA/600/R-09/052F, 2011: U.S. Environmental Protection Agency.of Pr

U.S. EPA. (2015). Standards of Performance for New Residential Wood Heaters. New Residential Hydronic Heaters and Forced-Air Furnaces. U.S. Environmental Protection Agency. 40 CFR 60 Subpart AAA.

U.S. EPA (2017a). Pre-2015 NSPS for New Residential Wood Heaters, New Residential Hydronic Heaters and Forced-Air Furnaces Historical List of EPA Certified Wood Heaters. https://www.epa.gov/sites/production/files/2015-11/documents/pre2015nsps-certifiedwood.pdf, accessed September 2017.

U.S. EPA (2017b). National Air Toxics Assessment — 2011 NATA: Assessment Results. https://www.epa.gov/national-air-toxics-assessment/2011-nata-assessment-results, accessed September 2017.

U.S. EPA (2017c). Our Nation's Air — Status and Trends Through 2016. https://gispub.epa.gov/air/trendsreport/2017/, accessed September 2017.

World Health Organization, Regional Office for Europe, Copenhagen. (2000). Air Quality Guidelines for Europe — Second Edition. Copenhagen, Denmark: WHO Regional Publications, European Series, No. 91.

TABLES

Table 1
Summary Update to Emission Estimates

Table # in Report	Emission Source Category	Changes and Updates from Original 2001 Clayton Report
2	Asphalt Pavement Mixture (APM) Plant	Emission factors updated for consistency with the U.S. EPA (2000) Emission Assessment Report, with most changes to fugitive emission estimates
3	Residential Fireplaces	PM10 emission estimate corrected and emission factor added for arsenic
4	Residential Wood Stoves	Emission factors developed for arsenic and formaldehyde
5	Bakeries	No updates to methodology
6	Barbeques	No updates to methodology
7	Lawn Mowers	Emission factors added for CO, NOx, and SO2
8	Auto Refueling	Methodology updated to 2008 changes to U.S. EPA AP42 emission factors and list of pollutants expanded
9a and 9b	Fast Food Restaurants	No changes to original calculations but second alternative method developed with expanded pollutant list
10	Breweries	New section/emission estimates
11	Emission Comparison Summary	Comparisons updated and expanded in response to emission updates within source categories

Table 2
Asphalt Pavement Mixture (APM) Plant
Emission Estimates and Comparison
with Previous Estimates

Pollutant	Previous Clayton 2001 Emission Estimates tons/yr	Revised APM Plant Emission Estimates			Ratio of Previous 2001 Clayton Emission Estimates to Revised Emission Estimates
		Drier Stack Emissions tons/yr	Fugitive Emissions tons/yr	Total (Drier Stack and Fugitive) tons/yr	
PM	3.4	2.3	0.1	2.4	0.72
CO	14	13	0.3	13	0.94
CO_2	3200	N/A	N/A	-	-
NOx	5.8	5.5	0	5.5	0.95
SO_2	1.1	1.1	0	1.1	1.0
TOC	4.9	4.4	1.7	6.1	1.2
CH_4	1.2	N/A	N/A	-	-
VOC	3.2	3.2	1.7	4.9	1.5
Isooctane	0.004	0.004	1.3E-05	0.0040	1.0
Benzene	0.051	0.039	6.7E-04	0.040	0.78
Ethylbenzene	0.024	0.024	0.0019	0.026	1.1
Formaldehyde	0.25	0.31	0.079	0.39	1.6
Toluene	0.015	0.29	0.0019	0.29	19
Xylenes	0.020	0.020	0.0056	0.026	1.3
2-Methylnaphthalene	0.0074	0.017	0.0022	0.019	2.6
Acenaphthene	1.4E-04	1.4E-04	2.1E-04	3.5E-04	2.5
Acenaphthylene	8.6E-04	0.0022	1.4E-05	0.0022	2.6
Anthracene	2.2E-05	3.1E-04	5.7E-05	3.7E-04	17
Benzo(a)anthracene	2.1E-05	2.1E-05	2.1E-05	4.2E-05	2.0
Benzo(a)pyrene	9.8E-07	1.0E-06	7.9E-07	1.8E-06	1.8
Benzo(b)fluoranthene	1.0E-05	1.0E-05	2.9E-06	1.3E-05	1.3
Benzo(g,h,i)perylene	1.1E-05	4.0E-06	6.5E-07	4.7E-06	0.42
Benzo(k)fluoranthene	4.1E-06	4.1E-06	7.5E-07	4.9E-06	1.2
Chrysene	1.8E-05	1.8E-05	9.0E-05	1.1E-04	6.0
Fluoranthene	6.1E-05	6.0E-05	5.5E-05	1.2E-04	1.9
Fluorene	3.8E-04	0.0011	5.2E-04	0.0016	4.3
Indeno(1,2,3-cd)pyrene	7.0E-07	7.0E-07	1.6E-07	8.6E-07	1.2
Naphthalene	0.0090	0.065	9.3E-04	0.066	7.3
Phenanthrene	7.6E-04	0.0023	7.4E-04	0.0030	4.0
Pyrene	5.4E-04	3.0E-04	1.6E-04	4.6E-04	0.85
Total PAHs	0.019	0.088	0.0050	0.093	4.9
Arsenic	5.60E-05	5.50E-05	N/A	5.5E-05	0.98
Barium	5.80E-04	N/A	N/A	-	-
Cadmium	4.10E-05	4.10E-05	N/A	4.1E-05	1.0
Chromium	5.50E-04	5.50E-04	N/A	5.5E-04	1.0
Hexavalent chromium	4.50E-05	4.50E-05	N/A	4.5E-05	1.0
Copper	3.10E-04	N/A	N/A	-	-
Lead	0.0015	0.0015	N/A	0.0015	1.0
Manganese	7.70E-04	7.50E-04	N/A	7.5E-04	0.97
Mercury	2.60E-04	2.60E-04	N/A	2.6E-04	1.0
Nickel	0.0063	0.0063	N/A	0.0063	1.0
Selenium	3.50E-05	3.50E-05	N/A	3.5E-05	1.0
Zinc	0.0061	N/A	N/A	-	-

Notes:

Emission estimates were made for an oil-fired drum-mix plant with a production of 200,000 tpy HMA.
Emission estimates based on U.S. EPA (2000) emssion assessment report.

N/A - indicates emission estimates not available in U.S. EPA (2000)

Table 3
Residential Fireplace Emission Estimates

Pollutant	Emission Factor	Units	Reference	Emissions per household (ton/yr)	Emissions for 20 households (ton/yr)
PM10	34.6	lb/ton	AP42 Section 1.9 (U.S. EPA, 1996a)	0.037	0.75
CO	252.6	lb/ton		0.27	5.5
CO_2	3400	lb/ton		3.7	73
NOx	2.6	lb/ton		0.0028	0.056
N_2O	0.3	lb/ton		3.2E-04	0.0065
SOx	0.4	lb/ton		4.3E-04	0.0086
VOC	**229**	**lb/ton**		**0.25**	**4.9**
POM	0.016	lb/ton		1.7E-05	3.5E-04
Aldehydes	2.4	lb/ton		0.0026	0.052
Arsenic	0.000228	lb/ton	NYSERDA (2013)	2.5E-07	4.9E-06

Calculations & Assumptions

Throughput of an average fireplace: Assume that the same amount of wood is burned in the average woodstove as in the average family fireplace, or approximately 1 cord of wood per year.

Arsenic emission factor based on the PM10 emission factor and an arsenic content in ash of 6.6 mg/kg (NYSERDA, 2013)

Reference: Equation from U.S. EPA (1987) is as follows:

1. Calculate an average wood use by calculating an average of the mean wood use values for all stove types using scale weighing and woodpile measurements.

Average wood use per household = (0.64+0.85+0.53+0.91+0.67+0.85+0.46+0.89)/8
Average wood use per household = 0.725 dry kg of wood/ heating degree day (HDD)

2. Convert wood use from dry kg/1000 HDD to tons dry wood use/year
(a) Convert from kg to tons dry kg/1000
0.725 HDD X 2.205 lb/kg X 1 ton/2000 lb
= 7.99E-04 dry ton wood X 2,700 HDD
(b) Convert from 1000 HDD to year

Assume that the Vermont and upstate New York region has three times as many HDD as the rest of the country. The reference reported 8,000 to 9,000 HDD/yr. Therefore, assume that there are 2,700 HDD/year.

7.99E-04 dry ton wood X 2,700 HDD

= 2.16 dry ton wood/yr

Boldface indicates pollutant with an emissions total equal to an APM plant

Table 4
Residential Wood Stove Emission Estimates

Pollutant	Emission Factor	Units	Reference	Emissions per household per year (tons/year)	Emissions for 19 households (ton/yr)
PM10	19.6	lb/ton	AP42 Section 1.10 (1996)	0.021	0.40
CO	140.8	lb/ton		0.15	2.9
SOx	0.4	lb/ton		4.3E-04	0.0082
TOC	28	lb/ton		0.030	0.57
TNMOC	12	lb/ton		0.013	0.25
CH_4	16	lb/ton		0.017	0.33
Ethane	1.47	lb/ton		0.0016	0.030
Ethylene	4.49	lb/ton		0.0048	0.092
Acetylene	1.124	lb/ton		0.0012	0.023
Propane	0.358	lb/ton		3.9E-04	0.0073
Propene	1.244	lb/ton		1.3E-03	0.026
i-Butane	0.028	lb/ton		3.0E-05	5.7E-04
n-Butane	0.056	lb/ton		6.0E-05	0.0011
Butenes	1.192	lb/ton		0.0013	0.024
Pentenes	0.616	lb/ton		6.6E-04	0.013
Benzene	**1.938**	**lb/ton**		**0.0021**	**0.040**
Furan	0.342	lb/ton		3.7E-04	0.0070
Furfural	0.486	lb/ton		5.2E-04	0.010
Methyl ethyl ketone	0.29	lb/ton		3.1E-04	0.0059
2-Methylfuran	0.656	lb/ton		7.1E-04	0.013
2,5-Dimethylfuran	0.162	lb/ton		1.7E-04	0.0033
Toluene	0.73	lb/ton		7.9E-04	0.015
o-Xylene	0.202	lb/ton		2.2E-04	0.0041
Acenaphthene	0.01	lb/ton		1.1E-05	2.1E-04
Acenaphthylene	0.032	lb/ton		3.5E-05	6.6E-04
Anthracene	0.009	lb/ton		9.7E-06	1.8E-04
Benzo(b)fluoranthene	0.004	lb/ton		4.3E-06	8.2E-05
Benzo(g,h,i)fluoranthene	0.028	lb/ton		3.0E-05	5.7E-04
Benzo(g,h,I)perylene	0.02	lb/ton		2.2E-05	4.1E-04
Benzo(a)Pyrene	0.006	lb/ton		6.5E-06	1.2E-04
Benzo(e)Pyrene	0.002	lb/ton		2.2E-06	4.1E-05
Biphenyl	0.022	lb/ton		2.4E-05	4.5E-04
Chrysene	0.01	lb/ton		1.1E-05	2.1E-04
Dibenzo(a,h)anthracene	0.004	lb/ton		4.3E-06	8.2E-05
7,12-Dimethylbenz(a)Anthracene	0.004	lb/ton		4.3E-06	8.2E-05
Fluoranthene	0.008	lb/ton		8.6E-06	1.6E-04
Fluorene	0.014	lb/ton		1.5E-05	2.9E-04
Indendo(1,2,3-cd)pyrene	0.02	lb/ton		2.2E-05	4.1E-04
9-Methylanthracene	0.004	lb/ton		4.3E-06	8.2E-05
12-Methylbenz(a)anthracene	0.002	lb/ton		2.2E-06	4.1E-05
1-Methylphenanthrene	0.03	lb/ton		3.2E-05	6.2E-04
Naphthalene	0.144	lb/ton		1.6E-04	0.0030
Perylene	0.002	lb/ton		2.2E-06	4.1E-05
Phenanthrene	0.118	lb/ton		1.3E-04	0.0024
Pyrene	0.008	lb/ton		8.6E-06	1.6E-04
Total PAHs	0.501	lb/ton	Sum from Acenapthene through Pyrene	5.4E-04	0.010
Cadmium	2.00E-05	lb/ton	AP42 Section 1.10 (U.S. EPA, 1996b)	2.2E-08	4.1E-07
Manganese	1.40E-04	lb/ton		1.5E-07	2.9E-06
Nickel	2.00E-05	lb/ton		2.2E-08	4.1E-07
Arsenic	1.29E-04	lb/ton	NYSERDA (2013)	1.4E-07	2.7E-06
Formaldehyde	1.94	lb/ton	Li (2007)	0.0021	0.040

Calculations & Assumptions:

Noncatalytic woodstove type assumed for criteria pollutants, PAHs and metals. Conventional stove type assumed for organic pollutants
Assume same wood use as calculated for fireplace calculations, which is 2.16 dry tons of wood/year

Arsenic emission factor based on the PM10 emission factor and an arsenic content in ash of 6.6 mg/kg (NYSERDA, 2013)

Boldface indicates pollutant with an emissions total equal to an APM plant

Table 5
Bakery Emission Estimates

Pollutant	Emission Factor	Units	Ref #	Emissions (ton/yr) (from equation)
VOC	6.9	lb/ton	AP42 Section 9.9.6 (1997)	60

Calculations & Assumptions:

Reference for values in equation and bread production: U.S. EPA (1992).

From the model ovens listed in the ACT, the one with medium-sized production and the largest emission factor was chosen, that is, model oven number 23. In addition to listing values for the variables in the emission factor equation, the ACT listed the emission factor and annual VOC emissions. These numbers were used.

AP-42 Equation:

VOC= 0.95Yi+0.195ti-0.51S-0.86ts+1.90

lb VOC per ton baked bread; Y i= initial baker's % of yeast; t i= total yeast action time in hours; S = final (spike) baker's % of yeast; ts = spiking time in hours

The variables for model oven no. 23 are: oven size=6X10^6 BTU/hr, Bread production = 17,308 tons /yr, Y=4.25, S=0, ti=5.15, ts=0, VOC emission factor (lbs/ton) = 6.9 and VOC Emissions (tons/yr) = 60

Emissions from bakery are 12 times greater than a typical asphalt plant

Table 6
Barbeque Emission Estimates

Pollutant	Emission Factor	Units	Ref #	Emissions per Household per year (tons/yr)	Emissions for Neighborhood of 336 Households (tons/yr)
TOC	0.0605	lb/min	Radian (1990)	0.018	6.1

Calculations & Assumptions:

Cooking time (min) on barbeque grill	30
Number of times per year using grill	20

Single household emissions

0.0605 lb/min * 30 min/event * 20 events/yr

= 36.3 lb/yr

= 0.01815 tons/yr

Table 7
Lawn Mower Emission Estimates

Pollutant	Emission Factor	Units	Reference	Emissions per Household per year (tons/yr)	Emissions for Neighborhood of 211 Households (tons/yr)
TOC	**437**	**g/hp-hr**	U.S. EPA (1991b)	**0.029**	**6.1**
PM	7.7	g/hp-hr		5.1E-04	0.11
Aldehydes	2	g/hp-hr		1.3E-04	0.028
CO	923.4	g/hp-hr		0.061	13
NOx	0.29	g/hp-hr		1.9E-05	0.0040
SO_2	0.54	g/hp-hr		3.6E-05	0.0075

Calculations & Assumptions:

Ave horsepower rating @ 30% load	1.2
Ave hours per year of operation	50

Calculation for TOC

(437 g/hp-hr * 1.2 hp * 50 hrs/yr) /(454 g/lb *2000 lb/ton)

= 0.02888 tons/yr

Boldface indicates pollutant with an emissions total equal to an APM plant

Table 8a
Auto Refueling Emission Estimates - Revised

Pollutant	Emission Factor	Units	Reference	Annual Emissions (tons/yr)
VOC	372	mg/l	AP42 Section 5.2 (U.S. EPA, 2008) with TOC = VOC	0.93
TOC	372			0.93
Benzene	5.4%	% of VOC emissions	Chin and Batterman (2012)	0.050
Toluene	13.5%			0.13
Ethylbenzene	2.7%			0.025
Xylene	12.0%			0.11

Calculations & Assumptions:

Throughput: Locating and Estimating document reported that the average filling station's throughput is 50,000 gallons per month.

$$\text{VOC emissions} = \left(\frac{372\ \text{mg}}{\text{l}}\right)\left(\frac{3.7854\ \text{l}}{\text{gal}}\right)\left(\frac{50000\ \text{gal}}{\text{mo}}\right)\left(\frac{12\ \text{mo}}{\text{yr}}\right)\left(\frac{\text{lb}}{453600\ \text{mg}}\right)\left(\frac{\text{ton}}{2000\ \text{lb}}\right) = 0.93\ \frac{\text{ton}}{\text{yr}}$$

Chin and Batterman (2012) report gasoline vapors contain 5.4% Benzene, 13.5% Toluene, 2.7% Ethylbenzene, and 12.0% Xylene

Benzene emissions = 5.4% * 0.93 tons/yr = 0.050 tons/yr

Toluene emissions = 13.5% * 0.93 tons/yr = 0.13 tons/yr

Ethylbenzene emissions = 2.7% * 0.93 tons/yr = 0.025 tons/yr

Xylene emissions = 12.0% * 0.93 tons/yr = 0.11 tons/yr

Table 8b
Auto Refueling Emission Estimates - Original

Pollutant	Emission Factor	Units	Reference	Annual Emissions (tons/yr)
Benzene	0.099	lb/1000 gal	U.S. EPA (1998a)	0.030
Toluene	139.9	mg/l	U.S. EPA (1994a)	0.35
Xylene	5.5	mg/l	U.S. EPA (1994b)	0.014
Total "VOC"			Sum of three compounds	0.39

Calculations & Assumptions:

Throughput: Locating and Estimating document reported that the average filling station's throughput is 50,000 gallons per month.

Benzene emissions = 0.099 lb/1000 gal * 50000 gal/mo * 12 mo/yr * 1 ton/2000lb

= 0.0297 tons/yr

Toluene emissions = 139.9 mg/l * 3.7854 l/gal * 50000 gal/mo * 12 mo/yr * 1 g/1000 mg * 1 lb/453.593g * 1 ton/2000 lb

= 0.350 tons/yr

Toluene emissions = 5.5 mg/l * 3.7854 l/gal * 50000 gal/mo * 12 mo/yr * 1 g/1000 mg * 1 lb/453.593g * 1 ton/2000 lb

= 0.0138 tons/yr

Table 9a
Fast-Food Restaurant Emission Estimates - Original

Pollutant	Emission Factor	Units	Reference	Emissions (tons/yr)
TOC	2,405	mg/kg	Rogge *et al* (1991)	0.18
2-Methylfuran	16.1	mg/kg		0.0012
Benzo(a)anthracene	0.29	mg/kg		2.1E-05
Benzo(b)fluoranthene	0.21	mg/kg		1.5E-05
Benzo(a)Pyrene	0.19	mg/kg		1.4E-05
Benzo(e)Pyrene	0.19	mg/kg		1.4E-05
Fluoranthene	0.35	mg/kg		2.6E-05
Pyrene	0.74	mg/kg		5.4E-05
Total PAHs				0.0013

Calculations & Assumptions:

To calculate throughput:

Clayton (2001) called Walker Holdings Group on 9/11/00. They own 8 Wendy's restaurants in the NC/southern VA area. Mr. Bert Walker reported that only data for their drive-thru sales were readily available.

Mr. Walker reported that the average (for 8 Wendy's) drive thru activity was 2,821 cars per week.

He added that the average check per car was $4.12.

Assumptions:

The same amount of sales occurred on foot (in the restaurant) as by the drive-thru.

The average sale consisted of one burger (plus fries and drink and other side dishes)

The average burger weighed 0.5 pound.

Throughput calculation:

Weekly number of sales = 2821*2 = 5642

Number of "half-pounders" sold = 5642

Weekly number of pounds of hamburger cooked = 5642 burgers/week * 0.5 lb/burger = 2821 lb/week

Annual mass of hamburger cooked at the average fast-food restaurant = weekly mass * 52

= 2821 lb/week * 52 weeks/year = 146692 lbs of hamburger cooked/yr

To calculate annual emissions:

TOC Emissions:

TOC Emissions = 2405 mg/kg * 0.4536 kg/lb * 146692 lb/yr * 1 g/1000mg * 1 lb/453.593g * 1 ton/2000lb

= 0.18 tons/year

Table 9b
Fast-Food Restaurant Emission Estimates - Alternative

Pollutant	Emission Factor	Units	Reference	Emissions (tons/yr)
TOC	4280	mg/kg	Lee (1999)	0.31
VOC	851	mg/kg		0.062
NOx	3140	mg/kg		0.23
PM10	8746	mg/kg		0.64
CO	162700	mg/kg		12
Aldehydes	874.6	mg/kg		0.064
Formaldehyde	394.1	mg/kg		0.029
Benzene	420.9	mg/kg		0.031
Toluene	160.9	mg/kg		0.012
Ethylbenzene	31.4	mg/kg		0.0023
Xylene	54.6	mg/kg		0.0040
Phenanthrene	1.12	mg/kg		8.2E-05
Fluoranthene	0.45	mg/kg		3.3E-05
Pyrene	0.34	mg/kg		2.5E-05
Naphthalene	21.1	mg/kg		0.0015
2-Methylnaphthalene	3.90	mg/kg		2.9E-04
Acenaphthylene	1.18	mg/kg		8.7E-05
Fluorene	0.43	mg/kg		3.2E-05
Total PAHs	28.5	mg/kg	Sum from Phenanthrene through Fluorene	0.0021

Calculations & Assumptions:

To calculate throughput:

Assume the same amount of meat coooked per year - 146692 lbs - estimated in the original analysis (see Table 9a)

To calculate annual emissions:

Use emission factors from grilling study by Lee (1999) as listed in table

Assume (as reported in Lee, 1999) THC = TOC, NO = NOx, and PM = PM10

TOC Emissions = 4280 mg/kg * 0.4536 kg/lb * 0 lb/yr * 1 g/1000mg * 1 lb/453.593g * 1 ton/2000lb

= 0.31 tons/year

Table 10
Brewery Emission Estimates

Pollutant	Emission Factor (lb/1000 bbl)	Units	References	Emissions (ton/yr) from a 60,000 bbl/year brewery
VOC	44.4	lb/bbl	AP42 Section 9.12.1 (U.S. EPA. 1996c); U.S. EPA (1996d); Radian (1992b)	1.3

Calculations & Assumptions:

VOC emissions from AP-42 Section 9.12.1 for Malt Beverages

Processes in Table 9.12.1-2 summed together for a sterilized bottle filling line

Volume of production (small brewery) = 60,000 barrels (bbl) per year based on AP-42 Section 9.12.1 background document (U.S. EPA, 1996d) estimate for the upper range of a small brewery

Table 11
Emission Comparison Table

Pollutant	Equivalent No. of a Selected Category	Selected Source Category
Arsenic	220	Residential Fireplaces
	390	Residential Woodstoves
Benzene	19	Residential Woodstoves
	1	Gasoline Filling Stations - Original
	1	Gasoline Filling Stations - Revised
	1	Fast Food Restaurant - Alternative
Ethylbenzene	1	Gasoline Filling Stations - Revised
	6	Fast Food Restaurant - Alternative
Formaldehyde	150	Residential Fireplaces
	190	Residential Woodstoves
	2900	Lawnmowers
	7	Fast Food Restaurant - Alternative
PM	65	Residential Fireplaces
	110	Residential Woodstoves
	4700	Lawnmowers
	2	Fast Food Restaurant - Alternative
TOC	470	Residential Woodstoves
	340	Barbecue Grills
	210	Lawnmowers
	35	Fast Food Restaurant - Original
	10	Fast Food Restaurant - Alternative
Total PAHs/POMs	5400	Residential Fireplaces
	180	Residential Woodstoves
	70	Fast Food Restaurant - Original
	21	Fast Food Restaurant - Alternative
Toluene	1700	Residential Woodstoves
	1	Gasoline Filling Stations - Original
	2	Gasoline Filling Stations - Revised
	12	Fast Food Restaurant - Alternative
VOC	20	Residential Fireplaces
	1/12	Bakery
	4	Breweries
	13	Gasoline Filling Stations - Original
	5	Gasoline Filling Stations - Revised
	39	Fast Food Restaurant - Alternative
Xylenes	120	Residential Woodstoves
	2	Gasoline Filling Stations - Original
	1/4	Gasoline Filling Stations - Revised
	3	Fast Food Restaurant - Alternative

Notes:
1. Typical emissions from an asphalt plant in tons/year (from the US EPA (2000) Emission Assessment Report):
TOC: 6.1
VOC: 4.9
PM: 2.4
Benzene: 0.03967
Toluene: 0.29187
Ethylbenzene: 0.025937
Xylenes: 0.025648
Total PAHs: 9.34E-02
Formaldehyde: 0.38896
Arsenic: 5.50E-05

Health Consultation

APAC CAROLINA INC. AND ASSOCIATED ASPHALT INC.
JAKE ALEXANDER BOULEVARD

SALISBURY, ROWAN COUNTY, NORTH CAROLINA 28144

EPA FACILITY ID: NCD095458204

FEBRUARY 14, 2007

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

You May Contact ATSDR Toll Free at
1-800-CDC-INFO
or
Visit our Home Page at: http://www.atsdr.cdc.gov

HEALTH CONSULTATION

APAC CAROLINA INC. AND ASSOCIATED ASPHALT INC.
JAKE ALEXANDER BOULEVARD

SALISBURY, ROWAN COUNTY, NORTH CAROLINA 28144

EPA FACILITY ID: NCD095458204

Prepared By:

Exposure Investigation and Site Assessment Branch
Division of Health Assessment and Consultation
Agency for Toxic Substances and Disease Registry

Table of Contents

Summary and Statement of Issues……..…….. …..1
Background…… …3
Community Health Concerns...……..…… …5
Discussion.…… …5
Results…… …....7
Child Health Considerations……..……..9
Conclusions……...10
Recommendations…….....12
Authors…….....14
References…….15
Acronyms……..…17

Figures
Figure 1 Salisbury Study Area……...19

Appendices

Appendix A. ATSDR'S Multi-Site Evaluation of Hot Mix Asphalt Plants and Similar Facilities

Appendix B. ATSDR's Evaluation of HMA Plants using AP-42 Parameters

Appendix C. Odors Discussion

Appendix D. Explanation of Comparison Values

Summary and Statement of Issues

Over a six year period, people living near several asphalt plants throughout the U.S., requested the Agency for Toxic Substances and Disease Registry (ATSDR) to investigate the potential health impact of asphalt emissions on their communities. Although the operations in each location varied (e.g., one community had three companies), all of the locations handled the constituent ingredients of asphalt – stone, sand, and liquid asphalt (aka asphalt cement). Community members most frequently expressed health concerns about respiratory distress and eye irritation and associated the symptoms with asphalt production because the symptoms occurred during or just following the characteristic asphalt odor. Since those symptoms may be exacerbated by the chemicals associated with asphalt, in response to the community requests, ATSDR investigated the airborne exposures at 7 locations between 1998 and 2004 in Arizona, California, Georgia, New York, North Carolina, and Utah (ATSDR 1999, 2001a, b, 2003, 2004, 2005).

One of the seven requests came from the Rowan Citizens Against Pollution. This group asked ATSDR to evaluate people living near 26 North Carolina Department of Transportation (NCDOT) asphalt company test sites. Two of the 26 sites were Associated Asphalt and APAC-CAROLINA, Inc. in Salisbury, NC. The group compiled a list of health concerns for the Salisbury location which included unexpected gastrointestinal illness, respiratory problems, cancer clusters, higher suicide rates, and death. ATSDR partially accepted the North Carolina petition request for the 26 facilities as we were already assessing some of the sites on the list and had made assessments on several others in other parts of the country.

In 2001, the Salisbury Air Quality Monitoring Study was conducted. ATSDR, the NC Division of Air Quality (NCDAQ) Mooresville Regional Office, and the city of Salisbury collaborated with the NCDAQ to complete the study. The study included ambient air monitoring and emission tests to estimate concentrations of several toxic pollutants in residential suburban areas adjacent to a liquid asphalt distribution terminal (Associated Asphalt, Inc.) and a hot mix asphalt plant (APAC-CAROLINA, Inc.). Between May and September 2001, data were collected for hydrogen sulfide (H_2S), volatile organic compounds (VOCs), and meteorological conditions. The Salisbury Air Quality Monitoring Study, Final Report was completed in August 29, 2003 (NCDAQ 2003) and the full report is available online at www.daq.state.nc.us/toxics/studies/salisbury/Salisbury_final_report.pdf.

This consultation will summarize those findings and report on ATSDR's multi-site evaluation of the seven locations referenced above. We acknowledge that this data represents a brief period in time and historical air contaminant levels are not represented.

Summary of Findings

Salisbury Specific

ATSDR determined the following from the data:

- The available data from Salisbury and near other asphalt plants suggests that

concentrations of polycyclic aromatic hydrocarbons (PAHs) and volatile organic carbons (VOCs) pose no acute (i.e., short-term) or chronic (i.e., long-term) public health hazard.
- Although limited to two days of sampling, Salisbury particulate levels for one day (respirable dust as $PM_{2.5}$) were above regulatory standards and could cause asthmatics and sensitive individuals to experience respiratory irritation. Most of both days' particulate levels (i.e., total dust, respirable dust and quartz) were higher than the background levels.
- The data from Salisbury are similar to those found at other asphalt sites.

The Salisbury Air Quality Monitoring Study determined the following:

Hydrogen Sulfide (H_2S)

- H_2S was the toxic compound emitted in the largest amount from the Associated Asphalt liquid asphalt terminal and it appears to be emitted at significant levels from hot mix asphalt plants.
- Monitoring data, process data, citizen complaints, and dispersion modeling support the conclusion that the liquid asphalt terminal is the primary contributor to H_2S levels above the odor threshold in the nearby area.
- Although measured H_2S in the residential areas surrounding the asphalt operations occasionally exceeded odor threshold levels and very likely reached or exceeded odor nuisance levels on a periodic basis, H_2S did not likely reach levels (concentrations) known to pose a long-term health hazard.

VOCs and PAHs

- Monitoring data and dispersion modeling show that ambient concentrations of benzene and VOCs in Salisbury are typical of air in similar communities with asphalt facilities.

ATSDR Multi-Site Evaluation

VOCs, PAHs, H_2S, Particulates

- ATSDR sampling from seven sites (including Salisbury) in the communities surrounding asphalt facilities showed that there do not appear to be any chemicals or compounds at levels that would pose a public health hazard. VOCs and PAHs were detected in very low concentrations, and only H_2S, and particulate matter (PM) – as respirable particulates or PM_{10} and $PM_{2.5}$ – were slightly elevated.

Sulfur dioxide (SO2), Nitrogen oxides (NOx), and Metals

- *Evaluation of Air Pollution (AP) Emission Factors*: ATSDR also reviewed the Environmental Protection Agency's (EPA's) AP-42 emission factors[1] for Hot Mix Asphalt (HMA) plants to determine if our detected sample constituents matched what was predicted. We had the following conclusions:

    - Based on both the emission rates and toxicities of the 159 chemicals reportedly emitted from asphalt plants, the compounds most capable of posing a health hazard in communities were sulfur dioxide (SO_2) and nitrogen oxides (NOx). Under some circumstances, carbon monoxide (CO), aldehydes (such as acrolein), particulates (such as quartz, dust) and some metals might also pose some concern, but they are much less likely to produce actual health effects in those exposed off-site.
    - Chemicals such as SO_2 and the aldehydes are highly reactive and at sufficiently high levels can cause irritation to the eyes and upper respiratory system. Particulates (such as quartz), which are released by HMA plants, can penetrate the lungs and cause inflammation and fibrosis if inhaled at sufficiently high levels.
    - Although scientists and regulators tend to associate H_2S as a major pollutant from asphalt facilities, SO_2, NOx, and many metals ranked higher than H_2S in their degree of toxicity, potential health risk and/or odor.

- We did not detect hazardous levels of VOCs, PAHs, or particulates at the seven asphalt sites we sampled. There remains a data gap for evaluating metals, aldehydes, SO_2, NOx, and CO. ATSDR is filling that data gap with subsequent sampling at facilities we are requested to evaluate.

Odor Responses

- Many compounds have odor thresholds that are lower than the levels thought to be hazardous. However, these warning odors may, by themselves, provoke odor-related symptoms such as fast heart rates, dizziness, nausea, sweating, and anxiety in sensitive individuals.

Background

How Are Asphalt Fumes Produced?

Liquid asphalt's composition varies each time it is made. Liquid asphalt is made in petroleum facilities; it is the distillate left over after oil is refined. Asphalt's chemical composition depends on the chemical complexity of the original crude petroleum as well as the manufacturing process.

[1] An emissions factor is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant. Emission factors for Hot Mix Asphalt Plants are listed in AP 42, Fifth Edition: Volume I, Compilation of Air Pollution Emission Factors, Stationary Point and Area Sources – January 1995

A full discussion on the chemical variability of asphalt can be found in the *Health Effects of Occupational Exposure to Asphalt* (CDC 2000).

For distribution and use, the liquid is loaded onto rail cars and sent to regional tank farms where the cars are heated and the liquid is pumped into the tanks (heated to 190-450^{o} F). During tank loading, condensers are used to prevent escape of vapors. From the tank farms, the heated liquid is loaded onto trucks and transported to the mix facilities where it is loaded into smaller tanks. Although fuel transfer stations are equipped with re-capture systems to prevent fumes from escaping, asphalt transfer stations are not.

The manufacturing process of asphalt can also affect its composition. Hot mix asphalt paving materials can be manufactured by the following: (1) batch mix plants, (2) continuous mix (mix outside drum) plants, (3) parallel flow drum mix plants, and (4) counterflow drum mix plants. This order of listing generally reflects the chronological order of development and use within the HMA industry (EPA 1976).

To produce the asphalt mix that is used for paving surfaces, the asphalt liquid is heated in an asphalt kettle and then poured into a mixing box where stone and sand (i.e., aggregate) are added and blended. The stone is ground in a manner that produces many surfaces for improved packing. A liquid hardener (sometimes called asphalt cement) made from petroleum distillates is also used.

Hot-mix asphalt (HMA) plants use aggregate that has been processed in a dryer to remove the moisture before it is mixed with liquid asphalt. HMA paving materials are a mixture of well-graded, high-quality aggregate (which can include reclaimed asphalt pavement (RAP)) (EPA 2004). Heating the aggregate generates fumes and the rotary drum dryer is the most significant source of emissions. The aggregate and liquid asphalt cement is heated and mixed in measured quantities to produce HMA. In most cases, the mixing plants need to be ducted and permitted as an emission source of both particulates and volatile organic compounds (VOC). Particulate emissions are reduced by a baghouse, cyclone or other emission control device. Particulate matter from other emission sources at the plant may also contribute fugitive emissions and require a permit (Ohio EPA 1996).

What Chemicals and Other Hazards are in Asphalt Fumes?

The most significant ducted source of emissions for all four types of HMA plants is the rotary drum dryer (EPA 1976, 1977, 2004). Batch mix processes have the greatest emission factors; parallel process and counter flow process plants have the same emission factors; however counter flow plants release the least VOC emissions (EPA 2004). The cleanest fuel for heating the asphalt is natural gas; between 70-90% of HMA plants use natural gas to dry and heat the aggregate (EPA 2004).

The rotary drum dryer emits the following compounds:

- water
- particulate matter (PM)
- products of combustion

- carbon dioxide (CO_2)
- nitrogen oxides (NO_x) e.g., nitrogen dioxide
- sulfur oxides (SO_x) e.g., sulfur dioxide
- carbon monoxide (CO)

- volatile organic compounds (VOCs)
- methane (CH_4)
- hazardous air pollutants (HAPs) (EPA 2004)

Specific compounds released in fumes include hydrogen sulfide (H_2S), formaldehyde, naphthalene, methylnaphthalene, toluene, hexane, and phenol (EPA 2004).

Many of these chemicals also are also emitted by other combustion sources such as exhaust from motor vehicles, fireplaces and wood stoves, wildfires, and industries.

Salisbury Site Description and History

Jake Alexander Boulevard in Salisbury, NC has many current and former industrial properties. Four of the five current or past industries involved petroleum products. The past operations included two bulk petroleum storage facilities currently undergoing soil and water remediation. The current operations include a concrete batching plant and two asphalt-related businesses – a liquid asphalt distribution terminal (Associated Asphalt, Inc.) and a hot mix asphalt plant (APAC-CAROLINA, Inc.). Residents adjacent to those businesses requested a study. The Milford Hills community was the site of an ambient air monitoring study and emission tests conducted to estimate concentrations of several toxic pollutants (NCDAQ 2003). See Figure 1.

Community Health Concerns

Community members have been and are concerned about groundwater and air pollution from the asphalt facilities in Salisbury. Community members most frequently expressed health concerns about respiratory distress and eye irritation. They also expressed concerns about gastrointestinal illness, cancer clusters, higher suicide rates, and death. (Please note that this consultation only addresses possible health effects from air pollution. The groundwater issues are addressed in another ATSDR consultation.)

Discussion

Most of the data to evaluate ambient air exposure were collected during a four month period in 2001. These data represent conditions occurring only during that timeframe. Many process changes occurred during the operational lifetimes of the facilities. For example, in the past, Associated (then Chevron) reportedly produced cut-back asphalt, a product that is made with up to 45% solvent (by volume). Additionally, the facilities' equipment and pollution controls changed over the years. Those process and equipment changes likely resulted in less releases of pollutants into the community.

ATSDR's Involvement in the Sampling at Salisbury

ATSDR conducted sampling and analysis of particulate matter (PM), polycyclic aromatic hydrocarbons (PAHs), and crystalline silica over a two-day period in 2001. That data is summarized in Appendix A. The Salisbury Air Quality Monitoring Study does not address the ATSDR effort. ATSDR also provided NCDAQ some of the air sampling equipment and comments on their sampling plan.

Salisbury Air Quality Monitoring Study – Sampling Summary

Data were collected at three monitoring sites from May through September 2001 for meteorological parameters, H_2S, and VOCs. The three monitoring sites were the Cul-de-sac site, the Access Road site, and the Remediation site denoted by A, B, and C respectively on Figure 1. Site A, the Cul-de-sac NCDAQ Monitoring Site, represented the neighborhood exposure site and was located 200 meters from the asphalt terminal. Site B, the Access Road NCDAQ Monitoring Site (Source Dominated Site), was within 30 meters of the asphalt terminal. Site C, the Remediation NCDAQ Monitoring Site, represented the upwind site was 400 meters from the asphalt terminal.

In addition, data were collected on process operations from both paving asphalt facilities, nearby road traffic, and odor complaints to characterize key parameters. These data were analyzed to evaluate relationships between each asphalt facility's process operations, remediation activities, wind direction, odor complaints and the H_2S and VOC concentrations. Direct H_2S and related odorous sulfur compounds measurements were also taken at the source of emissions at the liquid asphalt terminal (NCDAQ 2003). Finally, dispersion modeling using emission data and emission factors was performed to determine compliance with NC regulatory acceptable ambient levels (AALs) (NCDAQ 2003).

The monitoring sites and industrial sites in Figure 1 are numbered according to the following legend:

A. Cul-de-sac NCDAQ Monitoring Site [Neighborhood Exposure Site]
B. Access Road NCDAQ Monitoring Site [Source Dominated Site]
C. Remediation NCDAQ Monitoring Site [Upwind and Off-axis Site]
1. Concrete Supply Batch Concrete Plan
2. APAC-CAROLINA Hot Mix Asphalt Plant
3. Associated Asphalt, Inc. Distribution Terminal
4. Exxon/Mobil Remediation Site
5. Southern States Remediation Site
6. Southern Railway
7. Jake Alexander Boulevard

Salisbury Air Sampling Strategy and Procedures

Three monitoring sites were selected to characterize ambient air pollutant concentrations and meteorological data. Each monitoring site was configured with one meteorology station, one VOC sampling system, and one H_2S tape meter housed in a climate-controlled enclosure. The following is a list of the specific measurements:

1. Meteorological parameters included wind speed, wind direction, temperature, relative humidity, and barometric pressure;
2. Each VOC sampling system consisted of instrumentation to collect 24-hour ambient air samples in SUMMA™ canisters via XonTech™ 911A/912 equipment. The VOC sampling consisted of 24-hour periods from midnight to midnight. A total of 34 VOC samples covering 24-hour periods were collected on a random schedule and analyzed within the holding time. NCDAQ ATAST staff analyzed the ambient air samples for VOCs following EPA Method TO-14A. This method can identify and quantitate up to 40 organic compounds (NCDAQ 2003);
3. H_2S ambient air levels data were collected using Zellweger Analytics Tapemeters™ . This instrument uses a lead acetate-treated cloth tape reel to analyze for H_2S across a 2-90 parts per billion (ppb) range. After each 15-minute sample period the concentration data were stored on an attached data logger (NCDAQ 2003).

Asphalt facility process records were important for evaluating relationships with monitoring data. Process data from each asphalt facility were collected throughout the 117-day study period. Process data – collected weekly and organized into a computerized database – accounted for 90% of asphalt facility emissions. Process records and emissions for each asphalt facility varied over time.

Source testing was performed at the Associated Asphalt distribution terminal under normal operating conditions using EPA Method 15 for H_2S. In addition, NCDAQ staff collected preliminary H_2S data at the APAC hot mix asphalt plant and the two companies undergoing remediation (ExxonMobil and Southern States) performed VOC emission tests during the study (NCDAQ 2003).

The Salisbury Air Quality Monitoring Study final report contains more details on the sampling (NCDAQ 2003).

ATSDR's Multi-site Evaluation and Evaluation of HMA Plants using AP-42 Parameters

ATSDR's multi-site evaluation and evaluation of HMA plants using AP-42 parameters can be found in Appendices A and B.

Results

Salisbury Specific Results

Below is an excerpt from the Salisbury Air Quality Monitoring Study. For the August 29, 2003 complete report, access www.daq.state.nc.us/toxics/studies/salisbury/Salisbury_final_report.pdf

Hydrogen Sulfide

> H_2S Emissions: Comparison with VOC data shows that H_2S was by far the toxic compound emitted in the largest amount from this particular liquid asphalt operation. New emission test data from Associated Asphalt showing 2,400 parts per million (ppm)

H_2S from filling storage tanks with paving-grade liquid asphalt is in relative agreement with roofing asphalt data for levels up to 1,700 ppm. The derived emission factor for liquid asphalt railcar pumping operations is 0.0049 lb H_2S/ton of liquid asphalt. Facility wide emission rates for Associated were determined to be 0.41 lb/hr H_2S for normal operating conditions. Using a facility-wide emission rate of 0.41 lb/hr, the predicted H_2S 1-hour maximum impact concentration was 290 ppb, a level below the 1,500 ppb permissible acceptable ambient levels (AAL) guideline, but well above the odor threshold of 8 ppb.

Preliminary data collected using hand-held instruments at the APAC hot mix asphalt (HMA) plant suggest H_2S emission concentrations on the order of 90 ppm and 6 ppm near liquid asphalt storage tank filling and the dryer/mixer, respectively. Facility wide emission rates are estimated to be 0.76 lb/hr, a level above the toxic pollutant emission rate (TPER) guideline of 0.52 lb/hr. (Subsequent dispersion modeling showed levels at AAL; see discussion below). The derived emission factor for the dryer/mixer operations is estimated to be 0.005 lb H_2S /ton of HMA produced.

H_2S Dispersion Modeling: Dispersion modeling results showed that the ground level maximum impact for H_2S was predicted to be below its respective hourly AAL of 2.1 mg/m^3 (~ 1500 ppb) for APAC (0.006 mg/m^3 or 4.3 ppb) and for Associated (0.404 mg/m^3 or 290 ppb), individually. The H_2S isopleth analyses showed that maximum impacts are distributed close to Associated's northern property boundary near the Access Road sampling site (within 30 m) and then rapidly diminish. Ground level maximum impact concentrations above the odor threshold (0.011 mg/m^3, 8 ppb) were predicted for much of the area inside the Milford Hills subdivision. More favorable source characteristics[2] accounted for a lower and more distant (100 m from its property line) predicted maximum impact point for APAC as compared to Associated.

H_2S Ambient Monitoring: Measured 1-hour average H_2S data at the Access Road site located within 30 meters of the asphalt terminal exceeded odor threshold levels 28 times and approached or exceeded odor nuisance levels (40 ppb) only 3 times in 4 months. Measured 1-hour average H_2S data at the Cul-de-sac site located 200 meters from the asphalt terminal were above odor threshold levels only 4 times in 4 months, but did not approach odor nuisance levels. Measured 1-hour average H_2S data at the remediation site located 400 meters from the terminal neither exceeded odor threshold levels nor approached odor nuisance levels. Evaluation of the H_2S monitoring data relative to process and wind directional data revealed the following:

- H_2S ambient levels at the Access Road site were highest and occurred most frequently in the late evening hours when only the Associated Asphalt terminal was unloading railcars – its most H_2S emissive operation. The observation of peak

[2] The primary reason for APAC's lower maxima is that its emission concentration is 60-times lower than Associated. In addition, each of three factors (stack height, gas velocity, and gas temperature) also contributes to a taller effective stack height. Collectively, there is a compounding effect from these factors that cause APAC's source characteristics to produce a much lower H_2S concentration at ground level relative to Associated's plume (NCDAQ 2003).

H_2S ambient levels in the late evening is consistent with three other similar investigations performed by ATSDR. These peak H_2S levels can be explained by reduced conversion of H_2S to sulfur dioxide due to lower ozone levels and by reduced dispersion conditions, each of which is associated with late evening circumstances.

PAH and VOCs

VOC Emissions: Two of the six emission sources were found to release benzene emissions above the NCDAQ permitting threshold, or toxic pollutant exemption rate (TPER) value, of 8.1 lb/yr. These sources of benzene included the APAC hot mix asphalt plant (29 lb/yr) and the Southern States remediation site (58 lb/yr). The remaining four emission sources (Associated, Concrete Supply, Exxon/Mobil, and traffic from a one mile stretch of Jake Alexander Blvd.) combined only emit 2.5-lb/yr benzene. (VOC emissions were estimated from modeling then applying EPA Emissions Factors from AP-42)

VOC Dispersion Modeling: Dispersion modeling prediction results show that benzene from Southern States is the only Toxic Air Pollutant (TAP) in this study predicted to exceed its respective annual AAL guideline (1.2×10^{-4} mg/m^3, 0.12 ug/m^3, or 0.038 ppb). Its predicted ground level maximum impact was 1.02×10^{-3} ug/m3 (0.32 ppb), a level 850% of the NC regulatory acceptable ambient levels (AAL). However, the predicted maximum impacts are centered in the immediate vicinity (within 50 m) of the emission source and rapidly drop below AAL concentrations posing little/no long-term exposure potential to any individual. Furthermore, Southern States decided in March 2002 to discontinue operation of the air sparging system and is in the process of evaluating alternative technologies that will minimize or eliminate benzene emissions.

VOC Ambient Concentrations: Benzene, toluene, xylene and other VOC concentrations measured in the study were compared to 24-hour data from other sites similar to Salisbury and found to be in the same range. For example, the average 24-hour benzene concentration for Salisbury was 0.16 ppb, within the range of 0.13 - 0.24 ppb measured in other suburban and rural sites during 24-hour periods. NCDAQ concludes that in terms of ambient air quality, the concentrations measured in the Salisbury study indicate that the air in this area is typical of air in other similar areas.

Odors

During the study the city of Salisbury documented 38 citizen complaints. Most of the complaints occurred when only Associated was operating. Collectively, this body of results (H_2S source emission data, dispersion modeling, H_2S ambient monitoring data, process data, wind directional data, and odor complaints) point to the liquid asphalt terminal as the primary contributor largely responsible for the odor complaints and odor problem in Milford Hills.

Child Health Considerations

In communities faced with air, water, or food contamination, the many physical differences between children and adults demand special emphasis. Children could be at greater risk than are adults from certain kinds of exposure to hazardous substances. Children play outdoors and sometimes engage in hand-to-mouth behaviors that increase their exposure potential. Children are shorter than are adults; this means they breathe dust, soil, and vapors close to the ground. A child's lower body weight and higher air intake rate results in a greater dose of hazardous substance per unit of body weight. If toxic exposure levels are high enough during critical growth stages, the developing body systems of children can sustain permanent damage. Finally, children are dependent on adults for access to housing, for access to medical care, and for risk identification. Thus adults need as much information as possible to make informed decisions regarding their children's health.

ATSDR's health comparison values take children's susceptibility into account. Some of the highest values of contaminants at Salisbury may produce respiratory irritation in children and other more sensitive populations (e.g., elderly, people with pre-existing respiratory conditions, etc).

Conclusions

Salisbury Specific Conclusions

ATSDR's Conclusions

1. The available data from Salisbury and near other asphalt plants suggests that concentrations of polycyclic aromatic hydrocarbons (PAHs) and volatile organic carbons (VOCs) pose no acute (i.e., short-term) or chronic (i.e., long-term) public health hazard.

2. Although limited to two days of sampling, Salisbury particulate levels for one day (respirable dust as $PM_{2.5}$) were above regulatory standards and could cause asthmatics and sensitive individuals to experience respiratory irritation. Most of both days' particulate levels (i.e., total dust, respirable dust and quartz) were higher than the background levels.

3. Over the operational lifetime of the Salisbury asphalt plants, process and equipment changes likely resulted in less releases of pollutants into the community. If the ambient air pollutant concentrations were measured prior to those changes, they would likely have been higher.

Salisbury Air Study Conclusions

4. *Volatile Organic Carbon (VOC) and Polycyclic Aromatic Hydrocarbons (PAH) Ambient Concentrations.* Benzene, toluene, xylene and other VOC concentrations measured in the Salisbury study were compared to 24-hour data from other sites similar to Salisbury and found to be in the same range. NCDAQ concluded that in terms of ambient air quality, the concentrations measured in the Salisbury study indicate that the air in this area is typical of air in other similar areas (NCDAQ 2003). Although the VOCs and PAHs

(including Asphaltines) are not at levels known to pose a long-term health hazard, the health risk from the mixture of these and other chemicals is not well understood so it is prudent to reduce the levels where possible.

5. *H_2S Ambient Monitoring.* H_2S was the toxic compound emitted in the largest amount from the Associated Asphalt liquid asphalt terminal and appears to be emitted at significant levels from hot mix asphalt plants. Monitoring data, process data, citizen complaints, and dispersion modeling argue strongly that the liquid asphalt terminal is the primary contributor to H_2S levels above the odor threshold in the nearby area (NCDAQ 2003). Although measured H_2S in the residential areas surrounding the asphalt operations occasionally exceeded odor threshold levels and very likely reached or exceeded odor nuisance levels on a periodic basis, H_2S did not likely reach levels known to pose a long-term health hazard.

ATSDR Multi-Site Investigation Conclusions

VOCs, PAHs, H_2S, and Particulates

- ATSDR sampling from seven sites in the communities surrounding asphalt facilities showed that there does not appear to be any chemicals or compounds at levels that would pose a public health hazard. VOCs and PAHs were detected in very low concentrations and only H_2S, and particulate matter (PM) – as respirable particulates or PM_{10} and $PM_{2.5}$ – were slightly elevated. (See Table A2 in Appendix A).

- *NIOSH Asphalt Review:* In the December 2000 NIOSH report on the *Health Effects of Occupational Exposure to Asphalt*, NIOSH found no worker exposures to be hazardous in their five studies, but they encouraged more studies. Benzene soluble particulates (a.k.a. PAHs) were elevated (CDC 2000).

Sulfur dioxide (SO_2), Nitrogen oxides (NOx), and Metals

- *Evaluation of Air Pollution (AP) Emission Factors*: ATSDR also reviewed the AP-42 emission factor for Hot Mix Asphalt (HMA) plants to determine if our detected sample constituents matched what was predicted. We had the following conclusions:

    - Based on both the emission rates and toxicities of the 159 chemicals reportedly emitted from asphalt plants, the compounds most capable of posing a health hazard in communities were sulfur dioxide (SO_2) and nitrogen oxides (NOx). Under some circumstances, carbon monoxide (CO), aldehydes (such as acrolein), particulates (such as quartz, dust) and some metals might also pose some concern, but they are much less likely to produce actual health effects in those exposed off-site.
    - Chemicals such as SO_2 and the aldehydes are highly reactive and at sufficiently high levels can cause irritation to the eyes and upper respiratory system. Particulates (such as quartz), which are released by HMA plants, can

penetrate the lungs and cause inflammations and fibrosis if inhaled at sufficiently high levels.
- Although scientists and regulators tend to associate H_2S as a major pollutant from asphalt facilities, SO_2, NOx, and many metals ranked higher than H_2S in their degree of toxicity, potential health risk and/or odor.

- We did not detect hazardous levels of VOCs, PAHs, or particulates at the seven asphalt sites we sampled. There remains a data gap for evaluating metals, aldehydes, SO_2, NOx, and CO. ATSDR is filling that data gap with subsequent sampling at facilities we are requested to evaluate.

Odors

- Many compounds have odor thresholds that are lower than the levels thought to be hazardous. However, these warning odors can, by themselves, provoke odor-related symptoms such as fast heart rates, dizziness, nausea, sweating, and anxiety in sensitive individuals.

- The AP-42 compounds likely to have the highest degree of significant/sustained odor at HMA plants* would be the following:

1.	Sulfur Dioxide	6.	Xylene (m-/p-)
2.	Acetaldehyde	7.	Heptane
3.	Naphthalene	8.	Ethylene
4.	Toluene	9.	Acrolein
5.	Crotonaldehyde	10.	Acetone

*Note: Although H_2S did not rank high on this list because it did not have a significant emissions factor, it does have a low odor detection threshold of around 8 ppb in the general population and should be considered for sampling.

Recommendations

General Recommendations for Reducing Emissions from Asphalt Facilities

1. Install closed-system transfer units (likes those used at fuel transfer facilities) to reduce fugitive emissions.
2. Employ techniques to reduce particulate matter (e.g., wetting)

Salisbury-Specific Recommendations

NC Division of Air Quality (NCDAQ) Recommendations

A few recommendations from this study have already been implemented. These include the confirmed installation of carbon beds on Associated's storage tanks which reduce H_2S and VOC emissions, and use of alternative technologies to reduce benzene and other VOC emissions from the two remediation sites (NCDAQ 2003).

Note: Since the report was written, Associated Asphalt has reportedly gone out of business and is in the process of being sold.

NC Division of Air Quality (NCDAQ) Recommendations for Hot Mix Asphalt Plant Industry Action

- Determine sulfur content and H_2S content in current types of liquid asphalt in NC and evaluate the effect of these factors for hot mix asphalt plant operations (batch and drum plants) and distribution terminals.
- Identify other cost-effective H_2S emission controls for liquid asphalt operations.
- Develop pollution prevention measures to improve the environmental performance (i.e., reduce H_2S content and/or H_2S emissions) of liquid asphalt (NCDAQ 2003).

It would be useful to have more information on the behavior and fate of anti-strip additives in asphalt. There are indications from anecdotal and scientific information that odors and VOCs are emitted in asphalt facility operations using certain brands of these NC DOT required additives (NCDAQ 2003).

ATSDR General Recommendations for Evaluating Emissions from HMA Plants

3. At future asphalt facilities where an ATSDR evaluation is requested, include sampling for sulfur dioxide (SO_2), nitrogen dioxides (NOx), carbon oxides (CO, CO_2), and some metals. Continue to sample for particulates, VOCs, and PAHs.

4. Include sampling for compounds with the highest degree of significant/sustained odor at HMA plants such as sulfur dioxide, acetaldehyde, naphthalene, toluene, crotonaldehyde, xylene (m-/p-), heptane, ethylene, acrolein, acetone and hydrogen sulfide.

5. Consider how site-specific chemical mixtures may react and form other hazards such as acid gases and possibly include pH measurements where applicable.

Authors

Diane Jackson, BSCHE

Greg Zarus, MS

Technical Advisors

Frank Schnell, PhD

Lourdes Guevara- Rosales, MD

Betty Willis, MS (retired)

James Parker, EPA Summer student

References

AIHA (American Industrial Hygiene Association). 1997. Odor Thresholds for Chemicals with Established Occupational Health Standards 1997, Fairfax, VA

ATSDR (Agency for Toxic Substances and Disease Registry) 1999. Exposure Investigation for Mission Valley, San Diego, CA. November 4, 1999. U.S. Department of Health and Human Services, Atlanta.

ATSDR 2001a. Exposure Investigation for Prima Asphalt Concrete, Holtsville, NY. April 1, 2001. U.S. Department of Health and Human Services, Atlanta.

ATSDR 2001b. Exposure Investigation for Staker Paving Asphalt Production Plant, Erda, UT. May 17, 2001. U.S. Department of Health and Human Services, Atlanta.

ATSDR 2003. Exposure Investigation for Brimhall Sand and Gravel, Indian Wells, AZ. April 8, 2003. U.S. Department of Health and Human Services, Atlanta.

ATSDR 2004. Exposure Investigation for Meredith Williams Co, East Point, GA. September 29, 2004. U.S. Department of Health and Human Services, Atlanta.

ATSDR 2005. Health Consultation for Valley Asphalt, Spanish Fork, UT. December 8, 2005. U.S. Department of Health and Human Services, Atlanta.

Brunekreef B, Dockery DW, and Krzyzanowski M, 1995. Epidemiologic Studies on Short term Effects of Low Levels of Major Ambient Air Pollution Components. Environ Health Perspect 103(Suppl 2):3 13.

CDC (Centers for Disease Control and Prevention). 2000. Hazard Review. NIOSH Health Effects of Occupational Exposure to Asphalt. U.S. Department of Health and Human Services, Atlanta. Available online at http://www.cdc.gov/niosh/pdfs/01-110.pdf

EPA (Environmental Protection Agency), 1976. Preliminary Evaluation Of Air Pollution Aspects Of The Drum Mix Process, EPA-340/1-77-004, U.S. Environmental Protection Agency, Research Triangle Park, NC, March 1976. Available online at http://www.deq.state.ms.us/MDEQ.nsf/pdf/epd_AsphaltEmissionsFactors/$File/04General.pdf?OpenElement

EPA. 1977. Z.S. Kahn and T.W. Hughes, Source Assessment: Asphalt Paving Hot Mix, EPA-600/2-77-107n, U.S. Environmental Protection Agency, Cincinnati, OH, December 1977.

EPA 1999a. Criteria Pollutants. http://www.epa.gov/oar/oaqps/greenbk/o3co.html

EPA 1999b. Air Quality Trends 1994, Particulate Matter (PM 10). http://www.epa.gov/oar/aqtrnd94/six_pm10.html

EPA 2004.Emission Factor Documentation For AP-42 Section 11.1, Hot Mix Asphalt Production, U.S. Environmental Protection Agency, Research Triangle Park, NC, March 2004. http://www.epa.gov/ttn/chief/ap42/ch11/related/c11s01.html

Hazardous Substance Data Bank - http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB

McClellan R, 1997. Use of Mechanistic Data in Assessing Human Risks from Exposure to Particles. Environ Health Perspect 105(Suppl 5):1363 1372.

NC DAQ 2003. North Carolina Division of Air Quality, Toxics Protection Branch, Air Toxics Analytical Support Team (ATAST) ATAST Investigation Numbers 01007 and 01008. Final Study Report Salisbury Air Quality Monitoring Study. August 29, 2003 available online at http://www.daq.state.nc.us/toxics/studies/salisbury/Salisbury_final_report.pdf

Neas LM, Schwartz J, and Dockery D, 1999. A Case Crossover Analysis of Air Pollution and Mortality in Philadelphia. Environ Health Perspect 107:629 631.

Schiffman S, Williams, C.M. 2005. Science of Odors as a Potential Health Issue. J Environmental Quality 34:129-138

Shusterman D, Lipscomb J, Satin K, Neutra R. 1991. Symptom prevalence and odor-worry interaction near hazardous waste sites. Environ Health Perspect 94:25-30.

Shusterman D. 1992. Critical Review: The health significance of environmental odor pollution. Arch Environ Health 47:76-91.

Ohio EPA.1996 Fact Sheet: Information Regarding Asphalt Concrete Plants, Number 5, November 1996, Ohio EPA, Division of Air Pollution Control - http://www.epa.state.oh.us/dapc/sba/asp_con.html.

Van Gemert , L.J., Compilations of odor threshold values in air, water and media 2003, Boelens Aroma Chemical Information Service (BACIS)

Acronyms

AAL	Acceptable Ambient Level
APAC	APAC-CAROLINA, Inc. Hot Mix Asphalt Plant
ATSDR	Agency for Toxic Substances and Disease Registry
CDC	Centers for Disease Control and Prevention
CH_4	Methane
CO	Carbon monoxide
CO_2	Carbon dioxide
CV	Comparison value
EPA	U.S. Environmental Protection Agency
HAP	Hazardous Air Pollutant
HMA	Hot Mix Asphalt
H_2S	Hydrogen Sulfide
NCDAQ	North Carolina Division of Air Quality
NCDOT	North Carolina Department of Transportation
NIOSH	National Institute for Occupational Safety and Health
NOx	Nitrogen Oxides
PAH	polycyclic aromatic hydrocarbons
PM	Particulate matter
$PM_{2.5}$	Particulate Matter with aerodynamic diameter less than 2.5 microns

PM_{10}	Particulate Matter with aerodynamic diameter less than 10 microns
ppb	Parts per billion
SO_2	Sulfur dioxide
SVOC	Semi-volatile organic compounds
TAP	Toxic Air Pollutant
TPER	Toxic Pollutant Exemption Rate
VOC	Volatile organic compounds

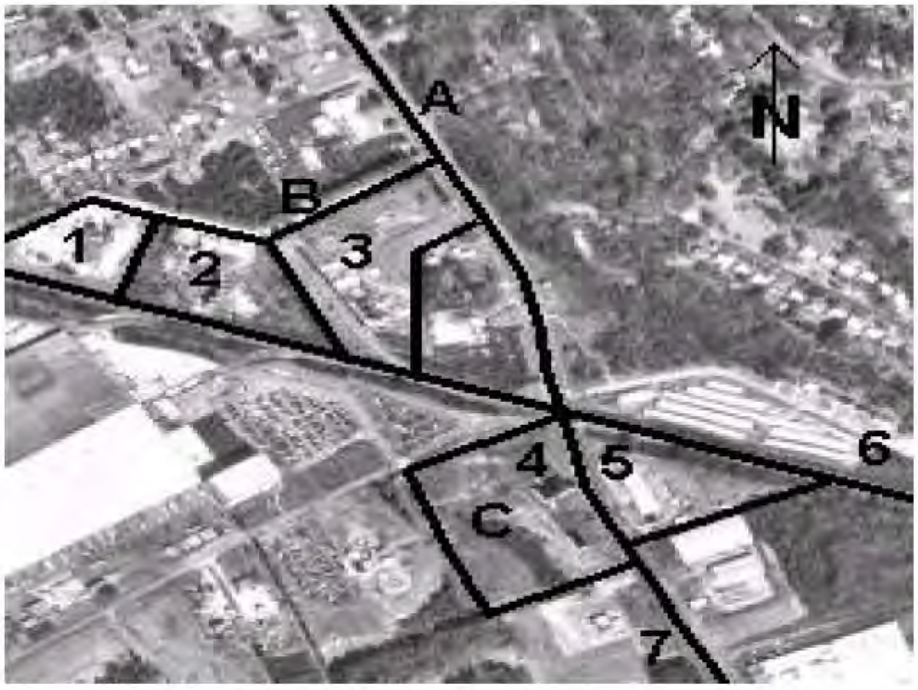


Figure 1. Salisbury Study Area. Aerial View of the Salisbury Monitoring study area showing the monitoring stations (A [Cul-de-sac], B [Access Road], C[Remediation site]), asphalt facilities (2, 3), concrete plant (1), remediation sites (4, 5), Southern Railway (6), and Jake Alexander Boulevard (7).

Appendix A

ATSDR's Multi-Site Evaluation of Hot Mix Asphalt Plants and similar facilities

A1

ATSDR's Multi-Site Evaluation Process

In response to community requests, ATSDR has conducted sampling in different communities across the country where asphalt was being produced. Because our sampling represented a relatively short time period – days to weeks – we also conducted a more in-depth evaluation using the emission factors for Hot Mix Asphalt (HMA) plants to determine what compounds you would expect to find in communities near those facilities. That evaluation is in Appendix B.

ATSDR Sampling and Analysis Methods for Community Exposure

ATSDR evaluated seven communities where asphalt was used. Those included communities in Arizona, California, Georgia*, North Carolina, New York, and two in Utah. One control "community" was also sampled. Upwind samples were collected in each community and served at the background comparison.

The operations and sampling methodology were unique at each site. Most samples were collected downwind. There were a few upwind samples and there were occasions when the wind changed to place the sampler downwind for only a portion of the sample duration.

ATSDR sampled for compounds known to be released from the facilities and considered measurable in the community. Those included Volatile Organic Compounds (VOCs), Semi-VOCs (i.e., polycyclic aromatic hydrocarbons (PAHs)), and particulates. Particulates were sampled in six communities. PAHs and VOCs were only sampled in three communities. Hydrogen sulfide and asbestos was sampled in two communities. Carbon monoxide was sampled in one community.

Volatile Organic Compounds – VOCs

Liquid asphalt or asphalt cement is derived from petroleum distillates which contain VOCs. ATSDR chose methods proven to provide reliable results for those chemicals considered to be highly toxic and or carcinogenic by ATSDR, EPA, or NIOSH. ATSDR chose one of the following methods at each site for our VOC analysis.

VOCs were collected using three methods, as whole samples (SUMMA®), adsorbed onto charcoal tubes, or adsorbed onto compound tubes. SUMMA® samples were collected by attaching a restrictive orifice onto an evacuated stainless steel canister. The orifices maintain a constant flow rate for up to 8-hours.

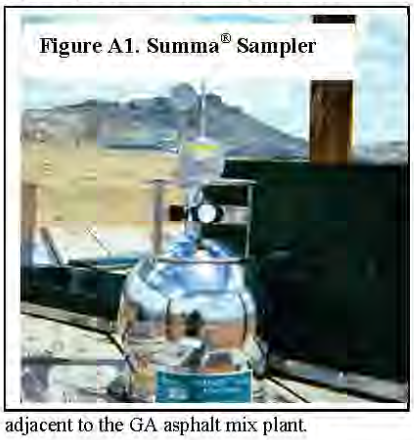


Figure A1. Summa® Sampler

* In Georgia, the creosote facility we were evaluating was adjacent to the GA asphalt mix plant.

SUMMA® samples were collected and analyzed following the EPA Method TO-14/TO-15 for VOCs. (TO-14/15). Samples were analyzed at a laboratory using gas chromatography/mass spectroscopy (GC/MS [ion trap]) with a cryogenically cooled trap to reduce the water vapor and concentrate the VOCs.

Other VOC samples were collected and analyzed according to the NIOSH Methods 1500, 1501, and 1003 for VOCs [7]. The sampling equipment consisted of a charcoal or carbon sorbent tube connected to a personal sampling pump. The sampling pumps were calibrated to collect approximately 1.5 liters of air through the sorbent tube and filter. The samples were collected over an 8-hour period (pre programmed into the samplers).

Some VOC samples were collected and analyzed following the EPA Method TO-17 for VOCs and SVOCs (TO-17).

Semi Volatile Organic Compounds – SVOCs

Figure A2. Personal pump

Asphalt cement is derived from petroleum distillates which contain SVOCs. The SVOC methods provide chemical specific analyses of PAHs. The methods chosen reliably detect chemicals considered to be highly toxic and or carcinogenic, but do not detect minimally toxic and heavy PAHs like asphaltines. NIOSH samples "benzene soluble particulates" as a group instead of individually, because NIOSH focuses on worker exposures to the spattered asphalt cement. Because community exposures occur farther downwind after the spattered asphalt (droplet) has an opportunity to either volatilize creating separate vapor-phased and particle-phased PAHs or drop out due to gravity, ATSDR uses chemical-specific analysis.

SVOCs including PAHs were collected using two methods, one that separated the particulate phase and one that did not.

Figure A3. Sorbent tube for SVOCs

SVOCs were collected and analyzed according to procedures consistent with NIOSH Method 5506 for PAHs. Samples were collected using a personal sampling pump and a filter head. The samples were collected over an 8 to 10-hour period (while the plant operations were occurring). The sampler head has two components: a polytetrafluoroethylene (PTFE) membrane to collect and retain particulate matter and a sorbent tube washed in XAD-2 resin to collect and retain gaseous phase compounds. Analytical detection procedures involved liquid chromatography and a fluorescence/ultraviolet detector.

Samples were collected and analyzed consistent with the modified NIOSH Method 5515 for PAHs. The sampling equipment consisted of an XAD-2 sorbent tube and a PTFE filter connected to a personal sampling pump. The sampling pumps were calibrated to collect approximately 1.5 liters of air through the sorbent tube and filter. The samples were collected over an 8 to 10-hour period.

Silica and Total Particulates

Asphalt mix used for paving is 95% crushed rock. Asphalt plants that have rock-crushing and sieving on-site make a lot of dust. Most of the earths crust contains silica and silica and quartz deposits are found in most bedrock. Natural weathering breaks down more of the softer minerals into dirt and dust leaving the harder minerals behind in the rock. Quartz is abundant and with a rating of 8 (of 10) on Moe's Hardness scale, it is hard to break down into small particulates (i.e., respirable) by natural weathering. However, stone crushers are strong enough to break quartz into finer particles not otherwise found naturally. Some workers exposed to fine particulate of silica-quartz experience silicosis. Most data on silicosis is found in workers who sandblast; however asphalt technology has recently changed to maximize the content of aggregate rock – which requires more crushing and sieving than before. Furthermore, local and state governments are utilizing asphalt more frequently.

Airborne particulates were collected using a sampling pump. The pump drew air through a tube connected to the specific collection device. Total suspended particulates were collected directly on a pre-weighed filter. Respirable particulates were first separated by

size with a cyclone separator. The cyclone separator captured particles that were 4.5 microns or smaller ("respirable"), and a pre-weighed filter collected the particles. Particulate measurements were made by weighing the filters (NIOSH Method 0500), and then the particulate samples were analyzed for silica using x-ray powder diffraction (NIOSH Method 7500). Samples were collected for 8-10 hours. Particulate monitors were attached to a data logger to characterize the peak particulate exposures.

Figure A4. Respirable dust sampling train

Figure A5. Assembled samplers for dusts and SVOCs

Asbestos

Natural asbestos is not abundant like quartz, but there are certain geological formations which contain high levels of asbestos. Gypsum rock has a lot of asbestos. ATSDR considers asbestos sampling near asphalt facilities because aggregate rock may be used from some regions of the county with natural asbestos formations. There are very specific methods for conducting asbestos sampling and the sampling method must match the exposure criteria. ATSDR developed a sampling criterion for communities after the World Trade Center disaster.

Asbestos fibers were collected with AirMetric miniVOL samplers. Samplers were programmed to run between nine and twelve hours with flow rates of approximately 4.2 liters per minute (lpm). Pre-loaded filter cassettes (25 mm dia, 0.45 um pore size, mixed cellulose ester (MCE)) assembled with a cowl, tapered-style for TEM analysis. Samples were submitted to EMSL Analytical Inc (Westmont, NJ) for asbestos fiber analysis by transmission electron microscopy (TEM) according to EPA Level II Method.

Carbon Monoxide (CO)

Asphalt is the waste product of petroleum distillation. It contains large amounts of carbon monoxide and carbon dioxide (CO and CO_2). The AirMetric MiniVol is standard equipment used by enforcement agencies

CO was sampled by using AirMetric MiniVOL. For scheduled run days, samplers were set to collect CO for 8- 12 hours 6:00 a.m. to 2 p.m. Samples were collected in 6-liter Tedlar bags connected to the sampler. Following sample collection, samples were analyzed using Thermo Environmental Instruments, gas-correlation CO analyzer, model 48. The analyzer was challenged with known concentrations of span and precision CO gases (percent deviation less than 4% from known concentration). Concentrations were reported in parts-per million (ppm) averaged over the 8 or 12-hr quartz near the asphalt sites.

Table A1. ATSDR Sampling Equipment and Methods

Chemical or Compounds	Sampling Equipment	Analytic Method	Accuracy
Volatile Organic Compounds (VOCs)	SUMMA® canisters	EPA TO-14 & 15	Not available
	Charcoal tubes	NIOSH 1500 NIOSH 1501 NIOSH 1003 EPA TO-17	
	Compound tubes		
Semi-Volatile Compounds (SVOCs) including PAHs	Sampler head with polytetrafluoroethylene (PTFE) membrane Sorbent tube with XAD-2 resin	NIOSH 5515 modified	Not available
Total particulates	Filter Cyclone separator (Respirable < 4.5 microns)	0500 7500 (silica)	**Range studied**: 8-28 mg/m^3 **BIAS:** 0.01% **OVERALL PRECISION (S^rT):** 0.056 [1] **ACCURACY:** ± 11.04%
Asbestos	Filter cassettes	EPA Level II Method (transmission electron microscopy (TEM))	Not available
Carbon Monoxide	Tedlar bags	Thermo Environmental Instruments, gas-correlation CO analyzer, model 48	Not available

ATSDR Multi-Site Sampling Results

Although the operations and sampling methodology were unique at each site, the results are similar –*measurable levels of contaminants were lower than those expected to cause health effects.* Table 2 displays the measured levels in the seven communities and the (composite) backgrounds.

PAHs

Acenapthene was sampled at five sites and found at three sites; however significant measurements were only measured at one site (and only in a few of the samples at that site). The highest measurement was much lower than EPA's Risk Based Concentration (RBC).

Odors

Hydrogen sulfide was only measured at two sites. It contributes a significant portion of the characteristic odor at asphalt facilities with an odor detection threshold of around 8 parts per billion (ppb) (11 ug/m^3) in the general population. From more than 2,800 hours of sampling at the two sites, H_2S was only exceeded ATSDR's health comparison value (30 ug/m^3) for 5 hours (NCDAQ 2003). H_2S samples were collected continuously throughout the day and converted to 1-hour averages at each monitoring site (NCDAQ 2003). We will discuss odors in more detail in the section on AP-42 parameters (Appendix B).

Particulates

Particulate matter measured downwind of asphalt sites averaged three times the average levels upwind of all the sites sampled.

> PM-10 (particles with an aerodynamic diameter smaller than 10 μm) particles are responsible for most adverse health effects associated with airborne contaminants because of their ability to reach the lower regions of the respiratory tract (EPA 1999a; McClellan 1997). EPA's health based national air quality standards for PM 10 is 150 μg/m^3 when measured as a daily average (EPA 1999b).
>
> Epidemiologic studies conducted in several metropolitan areas have shown adverse health effects associated with exposure to total suspended particulate (TSP) levels <100 μg/m^3 (Brunekreff et al, 1995; Neas et al, 1999).

Respirable dust averaged 1½ times more downwind of asphalt sites than upwind.

Quartz: No comparison could be made with quartz because few measurements were much higher than the detection levels. However, the total airborne quartz and respirable quartz were each found at half of the asphalt sites and not found in the background samples. This is significant in that ATSDR and EPA rarely detect quartz above the detection levels. We measured quartz in the soil near asphalt sites and found it was 6 times higher than the level in the background. The high levels of quartz in the soil

indicates deposition of quartz, therefore, the re-suspension of quartz may account for some of the airborne measurements of quartz near the asphalt sites.

Sampling Limitations

Sampling equipment

SUMMA canisters and compound sorbent tubes give very similar responses with a few exceptions. Compound tubes are best for semi-volatiles, but separate OSHA PAH samplers are needed if a wide range of PAHs (other than those we detected) are expected. Compound tubes stabilize some reactive compounds better. However, if there are compounds that do not adhere to the sorbent, the SUMMA canister must be used along with rapid analysis. In summary, although the methods give similar responses, some compounds will be captured more accurately with one method vs. the other. We found one important advantage to using the compound sorbent tubes; they detected some Tentatively Identified Compounds (TICs) that helped us identify the existence of a contributing source of PAHs at one site.

Sampling length and timeframe

ATSDR's sampling efforts are generally short-term (i.e., days to weeks). Our sampling efforts may or may not be conducted during critical times (upsets, higher production periods, worst waste stream processing). This makes the sampling a snapshot in time although we are often comparing the results to longer-term averages.

Since VOCs volatilize quickly, if they are released sporadically, they are experienced as peaks or spikes in the environment. However, if the equipment is set to capture a sample volume over a specified timeframe, the concentration detected would be averaged for the total volume analyzed thus reducing the peak concentrations. If the sample volume or timeframe is very long, VOCs are often in too low in concentration to be detected by analysis equipment.

Table A2. Summary of Concentrations measured in 7 Communities Surrounding Asphalt Sites (in µg/m³)

Chemical	CV	CV¥ Source	Averages (and Maximum) Level Detected — Sampling Locations							
			CA	NY	UT-1	UT-2	NC	GA	AZ	Back-ground
Acetone	30,000	i-EMEG	NS	NS	**8.5(22)**	ND	NS	ND	2.0(5.6)	2.4(8.0)
Benzene	20	i-EMEG	NS	NS	1.5 (3.4)	0.12(.13)	0.79 (1.7)	**2.9(14)**	0.6(1.1)	1.1(5.4)
Carbon Tetrachloride	200	i-EMEG	NS	NS	0.24 (.41)	0.18(.22)	0.63(0.79)	ND	ND	0.8(1.0)
Ethylbenzene	4000	i-EMEG	NS	NS	**0.59(2.7)**	ND	0.41 (1.9)	**12(18)**	ND	1.1(2.7)
Methylene Chloride	1000	i-EMEG	NS	NS	**0.77(2.4)**	0.26(.32)	**2.2 (3.8)**	ND	ND	0.5(2.7)
Tetrachloroethene	300	c-EMEG	NS	NS	0.054(.09)	ND	ND	**1.7(3.3)**	ND	0.5(2.4)
Toluene	300	c-EMEG	NS	NS	2.1 (3.9)	ND	1.9(4.3)	**32(38)**	1.0(1.4)	2.6(8.6)
1,1,1-Trichloroethane	4000	i-EMEG	NS	NS	**0.13(2.7)**	**0.15(.18)**	**0.28(0.38)**	ND	ND	ND
m,p-Xylene	3000***	i-EMEG	NS	NS	1.0(2.3)	ND	0.60(2.3)	**33(48)**	ND	2.2(7.1)
o-Xylene	3000***	i-EMEG	NS	NS	0.39(0.98)	ND	0.49(1.0)	**6.5(8.7)**	ND	1.2(3.6)
Carbon Disulfide	900	c-EMEG	NS	NS	**1.0(3.6)**	ND	NS	ND	**1.2(12.4)**	ND
Hydrogen Sulfide	30	i-MRL	NS	NS	NS	NS	**9(65.5)**	NS	**0.1(2)**	ND
Carbon Monoxide (ppb)	10,000	NAAQS (8 hr)	NS	NS	NS	1580(2980)	NS	NS	NS	NS
Acenaphthene	210	RBC	NS	NS	**1.3(2.9)**	**1.3**	ND	ND	**26 (70)**	ND
Benzo(a)anthracene	200	OSHA PEL	NS	NS	**0.14(0.44)**	ND	ND	ND	**0.02(.031)**	ND
Benzo(b)fluoranthene	200	OSHA PEL	NS	NS	**0.14(0.44)**	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	200	OSHA PEL	NS	NS	**0.07(0.13)**	ND	ND	ND	ND	ND
Fluoranthene	150	RBC	NS	NS	**0.30 (1.0)**	**0.08**	ND	ND	ND	ND
Fluorene	150	RBC	NS	NS	**0.11(0.24)**	**0.12**	ND	ND	**0.09(0.1)**	ND
Pyrene	110	RBC	NS	NS	**0.09(0.15)**	ND	ND	ND	ND	ND
Total Dust	150	EPA PM10 (24 hr)	**52(75)**	**18(33)**	**50(60)**	**14 (14)**	**140(150)**	NS	**22(38)**	16(21)
Respirable Dust	35	EPA PM2.5 (24 hr)	**28(49)**	**8.1(19)**	**23(30)**	**13(21)**	**30(40)**	NS	**19(30)**	13(30)
Total Quartz	200	NIOSH	**4.4(7.1)**	ND	**9.3(13)**	ND	ND	NS	**4(4.0)**	ND
Respirable Quartz	5****	NIOSH	**3.1(4.9)**	ND	ND	**4 (4)**	**2(4)**	NS	ND	ND
Soil Quartz (percent)	None	None	**19%**	**24%**	NS	NS	NS	NS	**29%**	4%
Asbestos (s/mm²)	20	AHERA	NS	**1.8(4.4)**	NS	ND	NS	NS	NS	1.5(4.3)

Measurements in **bold** are those that are higher than the background value.
Chemicals listed in *italics* are those that were higher than the background at three asphalt sites.
Background samples were collected upwind from several of the asphalt sites.
ND = Not detected. (detection levels varied)
NS = Not Sampled or Not Analyzed

¥ = For an explanation of terms used for CV Sources, see Appendix D.
§ = Half the detection limits were used to calculate the averages when an analyte was not detected in the downwind samples.
* = The CV for 1,2,4-Trimethylbenzene was adopted from that of 1,3,5-Trimethylbenzene based on NIOSH's treatment of these two chemicals as equals in terms of their Recommended Exposure Limit of 125,000 µg/m^3 for a 10-hr Time-Weighted Average (TWA).
** = m,p-xylene and o-xylene were assigned a comparison value for total xylenes due to a lack of individual comparison values.
***= NIOSH's REL is 50 ug/m^3. Since this is for occupational exposure, we divided the REL by a safety factor of 10 for community exposure.

Published documents with this air data include: ATSDR 1999, 2001a,b, 2003, 2004, 2005

References

ATSDR (Agency for Toxic Substances and Disease Registry) 1999. Exposure Investigation for Mission Valley, San Diego, CA. November 4, 1999. U.S. Department of Health and Human Services, Atlanta.

ATSDR 2001a. Exposure Investigation for Prima Asphalt Concrete, Holtsville, NY. April 1, 2001. U.S. Department of Health and Human Services, Atlanta.

ATSDR 2001b. Exposure Investigation for Staker Paving Asphalt Production Plant, Erda, UT. May 17, 2001. U.S. Department of Health and Human Services, Atlanta.

ATSDR 2003. Exposure Investigation for Brimhall Sand and Gravel, Indian Wells, AZ. April 8, 2003. U.S. Department of Health and Human Services, Atlanta.

ATSDR 2004. Exposure Investigation for Meredith Williams Co, East Point, GA. September 29, 2004. U.S. Department of Health and Human Services, Atlanta.

ATSDR 2005. Health Consultation for Valley Asphalt, Spanish Fork, UT. December 8, 2005. U.S. Department of Health and Human Services, Atlanta.

Brunekreef B, Dockery DW, and Krzyzanowski M, 1995. Epidemiologic Studies on Short term Effects of Low Levels of Major Ambient Air Pollution Components. Environ Health Perspect 103(Suppl 2):3 13.

EPA 1999a. Criteria Pollutants. http://www.epa.gov/oar/oaqps/greenbk/o3co.html

EPA 1999b. Air Quality Trends 1994, Particulate Matter (PM 10). http://www.epa.gov/oar/aqtrnd94/six_pm10.html

McClellan R, 1997. Use of Mechanistic Data in Assessing Human Risks from Exposure to Particles. Environ Health Perspect 105(Suppl 5):1363 1372.

Neas LM, Schwartz J, and Dockery D, 1999. A Case Crossover Analysis of Air Pollution and Mortality in Philadelphia. Environ Health Perspect 107:629 631.

NC DAQ 2003. North Carolina Division of Air Quality, Toxics Protection Branch, Air Toxics Analytical Support Team (ATAST) ATAST Investigation Numbers 01007 and 01008. Final Study Report Salisbury Air Quality Monitoring Study. August 29, 2003 available online at http://www.daq.state.nc.us/toxics/studies/salisbury/Salisbury_final_report.pdf

Appendix B

ATSDR's Evaluation of HMA Plants using AP-42 Parameters

B1

AP-42 and HMA Plant Emissions Factors

ATSDR reviewed the emission factors for Hot Mix Asphalt (HMA) Plants to determine if our predicted sample constituents matched what was detected in our own sampling. We also evaluated which chemicals may pose the greatest hazard.

What is potentially released from HMA plants?

EPA has estimated emissions factors for many industries, including Hot Mix Asphalt Plants. AP 42 (Volume I, Fifth Edition: Stationary Point and Area Sources – January 1995) has chapters on **External Combustion Sources, Solid Waste Disposal**, **Stationary Internal Combustion Sources**, **Evaporation Loss Sources**, **Petroleum Industry**, **Organic Chemical Process Industry**, **Liquid Storage Tanks**, **Inorganic Chemical Industry**, **Food and Agricultural Industries**, **Wood Products Industry**, **Mineral Products Industry**, **Metallurgical Industry**, **Miscellaneous Sources**, **Greenhouse Gas Biogenic Sources**, and **Ordnance Detonation**. Chapter 11, Mineral Products Industry, includes HMA plants (EPA 2004).

HMA plant emissions result from both controlled (i.e., ducted) and uncontrolled sources. Emissions are estimated for materials handling (fugitive emissions), generators (primarily diesel that are used at mobile plants for electricity), storage tanks, and process emissions (EPA 2004).

EPA defines an emissions factor as "*a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant.*" Emissions factors are usually expressed as the weight of pollutant divided by a unit weight, volume, distance, or duration of the activity emitting the pollutant (e.g., kilograms of particulate emitted per megagram of coal burned). Such factors facilitate estimation of emissions from various sources of air pollution. In most cases, these factors are simply averages of all available data of acceptable quality, and are generally assumed to be representative of long-term averages for all facilities in the source category (i.e., a population average) (EPA 2004).

The general equation for emissions estimation is:

$$E = A \times EF \times (1-ER/100)$$

where:
E = emissions;
A = activity rate;
EF = emission factor, and
ER =overall emission reduction efficiency, %
(EPA 2004 found online at
http://www.epa.gov/ttn/chief/ap42/index.html)

B1

Compounds Potentially Emitted From HMA Plants

AP42 predicts that HMA plants could emit as many as 159 compounds. Most of the predicted 159 compounds emitted from HMA plants do not warrant further assessment for community exposure because they are insignificant from the standpoint of toxicity, quantity emitted, or odor. To narrow the list that required an in-depth evaluation, ATSDR initially sorted compounds into the following groups:

Compounds of Interest	**Factors**
Emitted in Large Quantities	Emission Factor (EF)
Possible Effects	EF and Threshold Limit Value (TLV)
Potential Risk	EF and Hazard Index or Risk
Odor Warning Properties	Odor Threshold (OT) and TLV
Significant/Sustained Odor	EF and OT

1. Asphalt-related Compounds Emitted in Large Quantities

We examined the list of compounds associated with HMA Plant Emissions and sorted them by relative quantity. We ranked the "highly emitted" compounds based on **Emission Factor (EF)** data. Table B1 lists the top 10 Emissions Factors compiled from AP-42 for compounds potentially released from HMA plants. The entries are sorted by the relative predicted quantity of emissions. These predictions are based on data for all types of HMA plants (batch, counterflow, parallel flow) using all types of fuels (e.g., natural gas, #2 fuel oil, waste oil, etc.) and pollution control devices (e.g., cyclones, scrubbers, filters, etc.). *Compounds predicted to be emitted by HMAs in the greatest quantity are at the top of this list.*

Table B1. Emissions Factor Table

Chemical	CASRN	Max EF	MW	TLV ppm
Carbon Dioxide	124-38-9	3.30E+01	4.40E+01	5.00E+03
Total PM (particulate) or TSP	7601-54-9	3.20E+01	1.64E+02	N/A
PM10 (particulate matter <10m)		6.50E+00	N/A	N/A
Particulate PM-2.5		1.50E+00	N/A	N/A
Nitrogen Oxide (NOx)	11104-93-1	5.50E-01	3.00E+01	2.50E+01
Carbon Monoxide	630-08-0	1.30E-01	2.80E+01	2.50E+01
Organic PM (particulate matter)		5.80E-02	N/A	N/A
Sulfur Dioxide	7446-09-5	5.80E-02	6.41E+01	2.00E+00
TOC as propane (or total VOC)	74-98-6	4.40E-02	4.41E+01	1.00E+03
Methane	74-82-8	1.20E-02	1.60E+01	1.00E+03

CASRN-Chemical Abstract Registry Number
Max EF- Maximum Emissions Factor
MW- Molecular Weight
TLV- Threshold Limit Value

2. *Compounds with Possible Health Effects based on Quantity and Toxicity*

ATSDR examined the list of compounds that were released in the highest quantities, but had low Threshold Limit Values (TLVs). More toxic substances have lower TLVs. The **ratio of EF/TLV** represented compounds with possible health effects. *Those compounds that ranked higher on this list are those that are released in the highest quantities and also have a low threshold limit value (TLV).* Table B2 shows the top 10 list of possible compounds released from HMA plants sorted by the relative quantity predicted to be emitted (from all types of HMA plants) divided by the TLV.

Table B2. EF/TLV ppm

Chemical	CASRN	Max EF	TLV ppm	EF/TLV
Sulfur Dioxide	7446-09-5	5.80E-02	2.00E+00	0.028999999165535
Nitrogen Oxide (NOx)	11104-93-1	5.50E-01	2.50E+01	2.19999998807907E-02
Lead	7439-92-1	5.40E-04	5.00E-02	1.07999993488193E-02
Manganese	7439-96-5	6.50E-04	8.90E-02	7.30286259204149E-03
Carbon Dioxide	124-38-9	3.30E+01	5.00E+03	6.59999996423721E-03
Carbon Monoxide	630-08-0	1.30E-01	2.50E+01	5.2000000141561E-03
Formaldehyde	50-00-0	3.10E-03	1.00E+00	3.10000008903444E-03
Barium	7440-39-3	2.50E-04	8.90E-02	2.80777108855546E-03
Quinone	106-51-4	2.70E-04	1.00E-01	2.69999983720481E-03
Copper	7440-50-8	1.70E-04	7.69E-02	2.20930459909141E-03

3. *Compounds with Greatest Health Risk Based on Quantity Released and Hazard Index or Cancer Risk*

We looked at the compounds emitted in high quantities that had either a **high Hazard Index (HI) or high cancer risk (CR) level**. This Emission Risk Index sort was ranked according to EF divided by CV (either an HI or CR). Table B3 lists the top 10 results. Since a *higher risk is indicated by* a *lower* the risk value, the *compounds at the top of the list are those released in higher quantity and also have a relatively high hazard index or cancer risk.*

Note: Safety factors will impact the actual effect levels on which the Reference Doses (RfDs) and risk levels are based. As a result, the ratios (EF/HI and EF/"risk") will be a ranking of chemicals by RfD-associated or CSF-implied safety factors, rather than by relative hazard. (For example, PCDDs, PCDFs, PCBs, and PAHs would rank well above metals on such a list, even though metals would likely pose the more realistic hazard potential for exposed populations.)

The risk levels noted in Table B3 are based on EPA ambient air reports from Regions 3 and 9.

Table B3. Emission Factor/ Hazard Index or Risk					
Chemical	CASRN	Max EF	CV (ug/m3)	CV Ref (E=EPA)	EF/CV
Nickel	7440-02-0	1.30E-03	8.00E-03	CA@E-6R (E3)	0.162499994039536
Manganese	7439-96-5	6.50E-04	5.10E-02	N=0.1HI (E3)	1.27450982108712E-02
Benzene	71-43-2	3.90E-04	2.30E-01	CA@E-6R (E3)	1.69565214309841E-03
Acetaldehyde	75-07-0	1.30E-03	8.70E-01	CA@E-6R (E3)	1.49425282143056E-03
Barium	7440-39-3	2.50E-04	5.20E-01	N=0.1HI (E3)	4.80769260320812E-04
Carbon Monoxide	630-08-0	1.30E-01	1.00E+04	NAAQS (E)	1.29999998534913E-05
Toluene	108-88-3	2.90E-03	4.00E+02	N=0.1HI (E3)	7.24999972590012E-06
Hexane	110-54-3	9.20E-04	2.10E+02	N=0.1HI (E3)	4.38095230492763E-06
Xylene (m-/p-)	1330-20-7	2.70E-03	7.30E+02	N=0.1HI (E3)	3.69863028026884E-06
Acetone	67-64-1	8.30E-04	3.70E+02	N=0.1HI (E3)	2.24324321607128E-06
N = non-cancer risk # which is 10% of the EPA hazard index **CA@e-6R** = 10 to the minus 6 cancer risk **E3** = EPA Region 3 derived CV **E9** = EPA Region 9 derived CV					

4. Compounds with Low Odor Warning Properties

ATSDR examined each chemical based on whether it is odorous at levels above the TLV. *Those compounds with odor thresholds above the TLV provide little or no warning of exposure. We ranked these compounds according to* **Odor Threshold (OT)/Threshold Limit Value (TLV)**. Table B4 ranks the top 10 chemicals in *descending* order of their warning odor effectiveness. The ranking is a ratio of Toxicity to Odor, so that the greater the toxicity, relative to the degree of odor, the *higher* it will rank. The smellier the chemical, relative to its potential toxicity, the *lower* it will rank. However, the available *numerical surrogates* for Odor and Toxicity, i.e., the odor threshold (or mean OT) and the Threshold Limit Value (TLV), are actually *inverse indicators* of odor and toxicity. The *stronger* the odor of the substance (smellier), the *lower* the odor threshold (OT). Similarly, the *more toxic* the substance, then the *lower* the threshold limit value (TLV) (generally). In order to express the desired ratio Toxicity/Odor *using the OTs and TLVs*, the ratio must be written as "OT/TLV".

OT/TLV = (1/ ODOR)/(1/ TOXICITY) = **TOXICITY/ODOR**

In a list of chemicals ranked in *descending* order of OT/TLV ratios, those chemicals with the *least* effective warning odors will rank *highest* (i.e., have the *highest* OT/TLV ratios), while those with the *most* effective warning odors will rank *lowest* (i.e., have the *lowest* OT/TLV ratios).

Where possible, ATSDR used the geometric mean odor detection threshold (see list of odor references below). Where a mean was not available, we used the minimum odor detection threshold.

Table B4. Geometric Mean Odor Threshold of Detection/TLV				
Chemical	CASRN	GM_OTd_ppm	TLV ppm	OTd/TLV
Carbon Tetrachloride	56-23-5	252	5.00E+00	50.4000015258789
Acrolein	107-02-8	1.8	1.00E-01	18
Benzene	71-43-2	61	1.00E+01	6.09999990463257
Sulfur Dioxide	7446-09-5	2.7	2.00E+00	1.35000002384186
1,1,1-Trichloroethane	71-55-6	390	3.50E+02	1.11428570747375
Methyl chloroform	71-55-6	390	3.50E+02	1.11428570747375
Xylene (m-/p-)	1330-20-7	20	2.00E+01	1
Xylene (o-)	95-47-6	20	2.00E+01	0.998143136501312
Tetrachloroethene	127-18-4	47	5.00E+01	0.939999997615814
Ammonia	7664-41-7	17	2.50E+01	0.680000007152557

5. Compounds With a High Degree of Odor

ATSDR sorted the list of potentially emitted compounds based on the "Degree of Odor" using **Emission Factor (EF)/OT**. Substances which have low odor (detection) threshold and are emitted from HMA plants at higher concentrations will be at the top of this table. In Table B5, ATSDR ranks the top 10 chemicals in *descending* order based on those which are emitted at greater quantities and can only be detected (via odor) at higher concentrations.

Table B5. Maximum EF/Geometric Mean Odor Detection Threshold				
Chemical	CASRN	Max EF	GM_OTd_ppm	EF/OT
Sulfur Dioxide	7446-09-5	5.80E-02	2.7	2.14814804494381E-02
Acetaldehyde	75-07-0	1.30E-03	0.067	1.94029845297337E-02
Naphthalene	91-20-3	6.50E-04	0.038	1.71052645891905E-02
Toluene	108-88-3	2.90E-03	1.6	1.81249994784594E-03
Crotonaldehyde	4170-30-3	8.60E-05	0.11	7.81818176619709E-04
Xylene (m-/p-)	1330-20-7	2.70E-03	20	1.35000009322539E-04
Heptane	142-82-5	9.40E-03	230	4.08695632359013E-05
Ethylene	74-85-1	7.00E-03	270	2.59259268204914E-05
Acrolein	107-02-8	2.60E-05	1.8	1.44444447869319E-05
Acetone	67-64-1	8.30E-04	62	1.33870962599758E-05

How Did ATSDR Choose Odor Thresholds?

To find information on odors and odor responses for the 159 AP-42 chemicals, ATSDR used the following publications in this order:

1. Odor Thresholds for Chemicals with Established Occupational Health Standards 1997, AIHA Review Subcommittee, The American Industrial Hygiene Association;

ATSDR chose this publication first because the AIHA did an extensive literature review and rejected numerous studies based on a rigorous list of criteria. Studies accepted were then ranked by the panel size, panel odor sensitivity, panel calibration, and several other factors. Most of the chosen and rejected thresholds were compiled from reference #2.

2. Compilations of odor threshold values in air, water and media 2003, L.J. Van Gemert, Boelens Aroma Chemical Information Service (BACIS)

3. TLVs and BEIs Based on the Documentation of the Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices 2004, The American Conference of Governmental Industrial Hygienist.

Additional odor threshold information was acquired by researching different electronic databases. The electronic databases used included ISI Web of Science, PubMed, ProQuest and Micromedex (which provides information from Medtext, Hazardtext, CHRIS (Chemical Hazard Response Information System), HSDB (Hazardous Substance Data Bank), IRIS (Integrated Risk Information System), LOLI, NIOSH Pocket Guide, OHM/TADS (Oil and Hazardous Materials/Technical Assistance Data System), RTECS (Registry of Toxic Effects of Chemical Substances), Reprotext, Reprotox and Poisindex-Toxicology Management).

The odor thresholds and other relevant information from the electronic databases and literature was stored in a database.

How Did ATSDR Use These Tables?

The EF, OT/TLV, and EF/[HI or CR] tables were used in conjunction with TLV and selected Lowest Observable Adverse Effect Levels (LOAELs) to make decisions on which chemicals to investigate further in a toxicological evaluation.

The OT/TLV and EF/OT tables are useful for selecting chemicals for further literature searches on response and adverse response levels. ATSDR and others can use this information for making nuisance odor level recommendations.

Note on ATSDR site-specific sampling: When predicting community exposures, ATSDR generally uses worst case scenarios. Although we believe that most of the 159 compounds will not be detected in nearby communities due to low concentrations or, in the case of particulates, they usually fallout before they could reach a community, we still consider them and in many instances include them in our sampling and analytical methods

Top Compounds by Category from the AP-42 HMA Plant Emissions Factors Evaluation

Of the top 10 compounds from each of the previously discussed tables, *the most toxicologically significant substances were found to be sulfur dioxide, nitrogen dioxide, carbon monoxide, aldehydes (such as acrolein), some metals, and particulates (such as quartz, dust).*

The other chemicals represented in the tables are not likely to be toxic (at the concentrations found in the atmosphere) or are likely to be found in the air at extremely low concentrations, which are not significant enough to pose concern to the area's surrounding HMA plants. However, chemicals such as sulfur dioxide and the aldehydes are highly reactive and may cause irritation to the eyes and upper respiratory system. Further, particulates (such as quartz) which are released by HMA plants are comprised of substances which accumulate in the lungs and effect lung functions once inhaled (HSDB).

Top Ten List of Substances for which ATSDR Conducted Further Toxicological Evaluations

Compounds of Interest	**Factors**
Emitted in Large Quantities	Emission Factor (EF)
Possible Effects	EF and Threshold Limit Value (TLV)
Potential Risk	EF and Hazard Index or Risk
Odor Warning Properties	Odor Threshold (OT) and TLV
Significant/Sustained Odor	EF and OT

Emission Factor (EF) - Asphalt-related Compounds Emitted in Large Quantities

- Carbon Dioxide
- Carbon Monoxide
- Total PM (Particulate) TSP
- Organic PM (Particulate Matter)
- PM (Particulate matter <10m
- Sulfur Dioxide
- Particulate PM -2.5
- TOC as propane (or total VOC)
- Nitrogen Oxide (NOx)
- Methane

EF/Threshold Limit Value (TLV) - Compounds with Possible Health Effects based on Quantity and Toxicity

- Sulfur Dioxide
- Carbon Monoxide
- Nitrogen Oxide (NOx)
- Formaldehyde
- Lead
- Barium
- Manganese
- Quinone
- Carbon Dioxide
- Copper

EF/Hazard Index or Risk - Compounds with Greatest Health Risk Based on Quantity Released and Hazard Index or Cancer Risk

- Nickel
- Manganese
- Benzene
- Acetaldehyde
- Barium
- Carbon Monoxide
- Toluene
- Hexane
- Xylene (m-/p-)
- Acetone

Top Ten List of Substances which are Nuisance Odor Evaluation Indicators

Odor Threshold (OT)/TLV - Compounds with Low Odor Warning Properties

- Carbon Tetrachloride
- Acrolein
- Benzene
- Sulfur Dioxide
- 1,1,1-Trichloroethane
- Methyl chloroform
- Xylene (m-/p-)
- Xylene (o-)
- Tetrachloroethene
- Ammonia

EF/OT - Compounds with a High Degree of Odor*

- Sulfur Dioxide
- Acetaldehyde
- Naphthalene
- Toluene
- Crotonaldehyde
- Xylene (m-/p-)
- Heptane
- Ethylene
- Acrolein
- Acetone

*Note: Although H_2S did not rank high on this list because it did not have a significant emissions factor, it does have a low odor detection threshold of around 8 ppb (11 ug/m^3) in the general population and should be considered for sampling.

What AP-42 compounds were not sampled for by ATSDR in communities?

Sampling in the seven communities did not include metals, SO_2, NOx, and aldehydes and there was limited sampling for carbon monoxide. Additionally, we may need to consider how the mixture of chemicals may react to form other hazards such as acid gases. pH measurements may also be needed.

Headaches have been reported as a symptom in many of the communities tested. At what level do the COx compounds produce headaches?

CO and CO_2 are highly emitted from HMA plants. CO produces headaches at 200 ppm (over a 2-3 hour period) and 400 ppm (over a 1-2 hour period (See CO Reference Section).

CO_2 produces headaches at 2000-5000 ppm (See CO_2 Reference Section). The typical level found in occupied spaces with good air exchange is 350 – 1,000 ppm. The levels associated with complaints of drowsiness and poor air are 1,000 – 2,000 ppm.

Using the emissions factors, a typical batch HMA plant produces 6.5 ton/yr CO and 1,650 ton/yr CO_2. A typical drum mix plant produces 13 ton/yr CO and 3,300 ton/yr CO_2. Using those output rates and modeling worst case conditions with SCREEN3[1], it is possible that people may experience headaches from CO for a little more than ½ mile from a facility and from CO_2 up to 4 miles of a facility. However, ATSDR sampling for CO at one site showed a very low downwind concentration of just over 1 ppm. At future asphalt facilities where an ATSDR evaluation is requested, we will include sampling for carbon oxides (CO, CO_2).

Overall Conclusions

As a result of this emission factors evaluation, ATSDR's future sampling at asphalt facilities will also include sulfur dioxide (SO_2), nitrogen dioxides (NOx), carbon oxides (CO, CO_2), and some metals as well as continued sampling for particulates, hydrogen sulfide, VOCs, and PAHs.

We will also include sampling for compounds with the highest degree of significant/sustained odor such as acetaldehyde, naphthalene, toluene, crotonaldehyde, xylene (m-/p-), heptane, ethylene, acrolein, and acetone.

Since chemical mixtures may react and form other hazards such as acid gases, we will include pH measurements where applicable.

[1] SCREEN3 – is a single source Gaussian plume model which provides maximum ground-level concentrations for point, area, flare, and volume sources, as well as concentrations in the cavity zone, and concentrations due to inversion break-up and shoreline fumigation. SCREEN3 is a screening version of the ISC3 model. http://www.epa.gov/scram001/dispersion_screening.htm#screen3

CO References:

Annual Review of Pharmacology
Vol. 15: 409-423 (Volume publication date April 1975)
(doi:10.1146/annurev.pa.15.040175.002205)
The Effect of Carbon Monoxide on Humans
R D Stewart
Title: Warehouse workers' headache.
Source: Journal of occupational medicine [0096-1736] Fleming yr:1992 vol:34 iss:9 pg:872 -872
http://www.ccohs.ca/oshanswers/chemicals/chem_profiles/carbon_dioxide/health_cd.htm
http://www.dhfs.state.wi.us/eh/ChemFS/fs/CarbonDioxide.htm
http://www.aerias.org/DesktopModules/ArticleDetail.aspx?articleId=138&spaceid=2&subid=13
http://www.intox.org/databank/documents/chemical/carbdiox/cie747.htm
http://www.intox.org/databank/documents/chemical/carbmono/cie57.htm
www.ohsonline.com/Stevens/OHSPub.nsf/Articles2/8B509CAEB2CBF8B88625719A005DA18B?
http://www.osha.gov/dts/sltc/methods/inorganic/id172/id172.html#ref86
http://www.osha.gov/dts/sltc/methods/inorganic/id209/id209.html

CO_2 References:

http://dhfs.wisconsin.gov/eh/ChemFS/fs/CarbonDioxide.htm
www.abe.iastate.edu/human_house/aen125.asp
www.airproducts.com/nr/rdonlyres/ 6582611c-16c6-4660-8584-c172182fb0c2/0/safety18.pdf
www.deh.gov.au/atmosphere/airquality/ publications/sok/profiles/**carbon**monoxide.html
www.epa.gov/Ozone/snap/fire/co2/appendixb.pdf

Appendix C. Odors Discussion

In general, people have become more intolerant of environmental odors while at the same time, air quality has improved. As "background" odor levels are decreasing, people have become more sensitive and able to detect very low, transient environmental levels.

"Unpleasant odors have long been recognized as warning signs of potential risks to human health. We now know that odors from environmental sources might indeed *cause* health symptoms depending on the individual and the environmental factors" (Schiffman *et al,* 2005). Odor-related mechanisms that may result in symptoms include innate odor aversion, stress-induced illness, aversive conditioning phenomena, and aggravation of existing medical conditions, such as bronchial asthma (Shusterman 1992). After exposure to environmental odors, these processes may occur in some individuals and not in others. Smokers and the elderly may be less aware of odors and therefore at risk for prolonged exposure. In general, women are more sensitive to environmental odors than men are.

Odor-related aversive conditioning may occur when a person experiences low-level odors after an initial traumatic exposure. A common response is hyperventilation with a fast heart rate, dizziness, nausea, sweating, and anxiety. Stress-related health effects may, to some extent, be related to the degree to which an individual believes an odor is causing risk. The symptom-causing odor thresholds of some contaminants may be below levels thought to be hazardous, thus defying classic toxicological explanations. These odor-related mechanisms would help to explain why health complaints expressed by some communities often occur when contaminants are detected below levels associated with known adverse health effects (Shusterman *et al,* 1991).

References

Schiffman S, Williams, C.M. 2005. Science of Odors as a Potential Health Issue. J Environmental Quality 34:129-138

Shusterman D, Lipscomb J, Satin K, Neutra R. 1991. Symptom prevalence and odor-worry interaction near hazardous waste sites. Environ Health Perspect 94:25-30.

Shusterman D. 1992. Critical Review: The health significance of environmental odor pollution. Arch Environ Health 47:76-91.

Appendix D. Explanation of Comparison Values

AHERA – Asbestos Hazard Emergency Response Act signed by EPA

CR- Cancer Risk

c-EMEG – ATSDR's Environmental Media Evaluation Guide based on chronic exposure (>365 days)

i-EMEG – ATSDR's Environmental Media Evaluation Guide based on intermediate exposure (15-364 days)

EPA PM10 & EPA PM2.5 – PM 10 is measure of particles in the atmosphere with a diameter of less than ten or equal to a nominal 10 micrometers. PM-2.5 is a measure of smaller particles in the air. PM-10 has been the pollutant particulate level standard against which EPA has been measuring Clean Air Act compliance. On the basis of newer scientific findings, EPA is considering regulations that will make PM-2.5 the new "standard".

HI – Hazard Index

i-MRL- An ATSDR estimate of daily human exposure to a hazardous substance at or below which that substance is unlikely to pose a measurable risk of harmful (adverse), noncancerous effects. MRLs are calculated for a route of exposure (inhalation or oral) over a specified time period (acute, intermediate, or chronic). MRLs should not be used as predictors of harmful (adverse) health effects. (i stands for intermediate and represents between 15 and 364 days of exposure.)

NAAQS – National Ambient Air Quality Standards: Standards established by EPA that apply for outdoor air throughout the country.

NIOSH – National Institute for Occupational Safety and Health (NIOSH)

OSHA PEL – OSHA (Occupational Safety & Health Administration) sets permissible exposure limits (PELs) to protect workers against the health effects of exposure to hazardous substances. PELs are regulatory limits on the amount or concentration of a substance in the air. They may also contain a skin designation. PELs are enforceable. OSHA PELs are based on an 8-hour time weighted average (TWA) exposure.

RBC – The Risk Based Concentration (RBC) Table contains Reference Doses (RfDs) and Cancer Slope Factors (CSFs) for about 400 chemicals. These toxicity factors have been combined with "standard" exposure scenarios to calculate RBCs--chemical concentrations corresponding to fixed levels of risk (i.e., a Hazard Quotient (HQ) of 1, or lifetime cancer risk of 1E-6, whichever occurs at a lower concentration) in water, air, fish tissue, and soil. They can be found at the following website. http://www.epa.gov/reg3hwmd/risk/human/index.htm

TLV – Threshold Limit Values (TLVs) are not standards. They are guidelines designed for use by industrial hygienists in making decisions regarding safe levels of exposure to various chemical substances and physical agents found in the workplace. In using these guidelines, industrial hygienists are cautioned that the TLVs are only one of multiple factors to be considered in evaluating specific workplace situations and conditions.
TLVs are determinations made by a voluntary body of independent knowledgeable individuals. They represent the opinion of the scientific community that has reviewed the data described in the Documentation, that exposure at or below the level of the TLV does not create an unreasonable risk of disease or injury.

TLVs are health-based values established by committees that review existing published and peer-reviewed literature in various scientific disciplines (e.g., industrial hygiene, toxicology, occupational medicine, and epidemiology). Since TLVs are based solely on health factors, there is no consideration given to economic or technical feasibility. (http://www.acgih.org/TLV/)

D2

Exhibit I

Health Risk Assessment Evaluation

&

Powerpoint Presentation

&

Stephen G. Zemba, PhD, PE Resume

Health Risk Assessment Evaluation
Connell Resources Inc. Proposed Hot-Mix Asphalt Plant

Stephen Zemba, PhD
Wellington Planning Commission Meeting
June 5, 2023

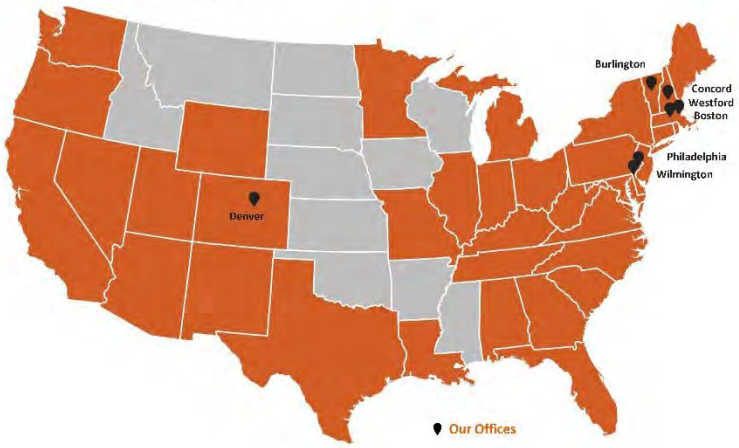
SANBORN HEAD

© Sanborn, Head & Associates, Inc.

OVERVIEW

- Employee-Owned, Est. in 1993
- Multi-disciplinary:
  - solid waste
  - environmental
  - hydrogeology
  - geotechnical
  - civil
  - chemical
  - mechanical
  - electrical
  - risk assessment
- Approximately 180 employees
- Concord, NH (Headquarters)

Where We're Registered



SANBORN HEAD

2

SERVICES

- Air Services and Modeling
- Brownfields Redevelopment
- Data Management & Visualization
- Due Diligence
- Geotechnical Design
- Landfill Gas Management
- Legal Support
- Natural Gas Infrastructure Design
- Permitting & Compliance
- Renewable Energy
- Site Characterization & Remediation
- Solid Waste Facility Design
- Water Resources

SANBORN HEAD

3

Solid Waste

Energy

Industrial

Development

CLIENT SERVICE AREAS

4

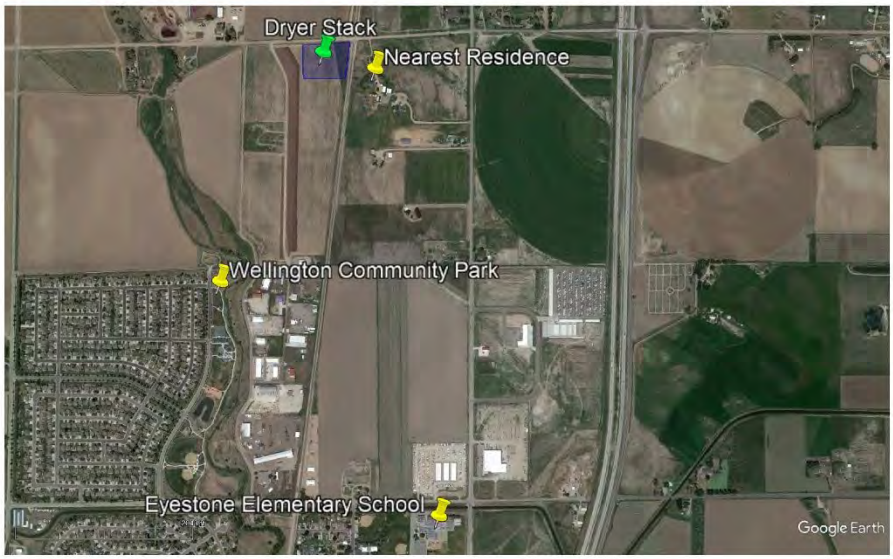
Air Impact Assessment (Antea Group)

- Voluntary study – Not required by the Colorado Department of Public Health & Environment (CDPHE)
- Estimates changes to local air quality that will result from operation of the proposed hot-mix asphalt plant

SANBORN HEAD

5

Key Locations Examined in the Air Quality Impact Study



SANBORN HEAD

6

Air Impact Assessment -- Scope of Pollutants

Criteria Pollutants

- Particulate Matter
  - Total
  - Smaller than 10 µm (PM_{10})
  - Smaller than 2.5 µm ($PM_{2.5}$)
- Nitrogen Oxides (NO_X)
- Sulfur Dioxide (SO_2)
- Carbon Monoxide (CO)

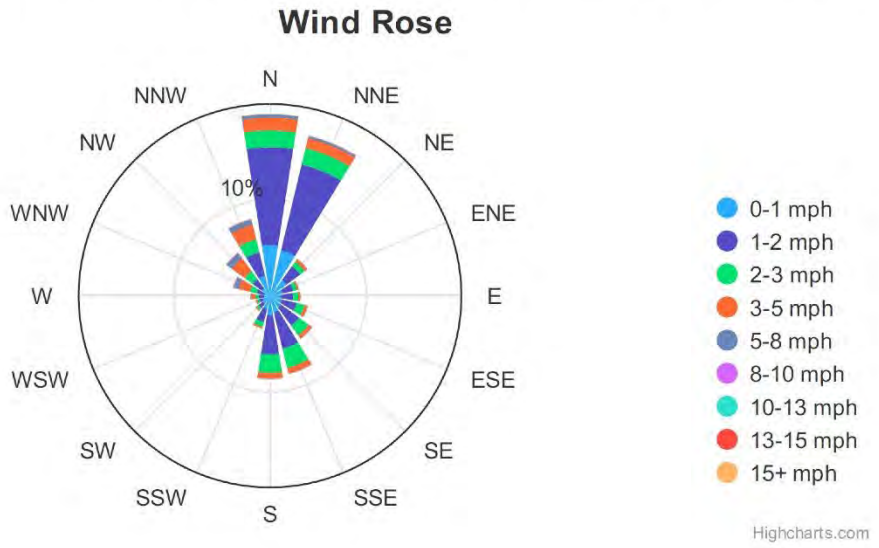
Key Air Toxics

- Acetaldehyde
- Hexane
- Formaldehyde
- Toluene
- Quinone
- Benzene
- Ethylbenzene
- Xylenes
- Polycyclic Aromatic Hydrocarbons (PAHs)
- Hydrogen Chloride (HCl)

SANBORN HEAD

7

Hourly Meteorological Data (from Antea Group)



SANBORN HEAD

8

Antea Group's Criteria Pollutant Assessment

Connell Resources
Wellington, CO
Table 3: Summary of AerMod Calculated Emissions and NAAQS

Pollutant	Averaging Period	AerMod Concentration for Wellington Location ($\mu g/m^3$)	NAAQS Primary Concentration[1] ($\mu g/m^3$)	AerMod Wellington Percent of NAAQS
PM-10	24-hour	0.15	150	0.1%
PM-2.5	24-hour	0.042	35	0.1%
	1-year	0.0025	12	0.02%
NOx	1-hour	7.1	188 ab	4%
	1-year	0.10	100 ab	0.1%
SO2	1-hour	7.5	196 a	4%
CO	1-hour	17	40,000 a	0.0%
	8-hour	10	10,000 a	0.1%

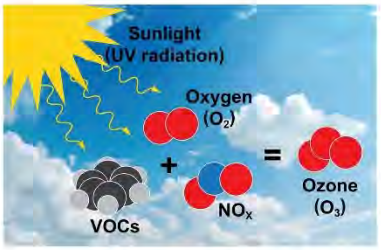
Notes
$\mu g/m^3$ = micrograms per cubic meter
1 = National Ambient Air Quality Standards (NAAQS) for public health protection, including the health of sensitive populations
a = Conversion of units from ppm provided by NAAQS to $\mu g/m^3$ provided by California Air Resource Board
b = Standard provided for NO_2

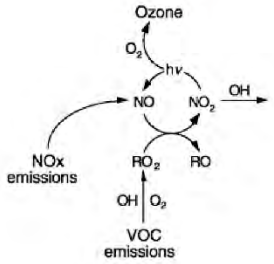
SANBORN HEAD

9

Air Quality in Larimer County – Ozone Non-Attainment

- Principal air quality issue in Larimer county is ozone (O_3)
- Ozone is created in the atmosphere from chemical reactions involving nitrogen oxides (NOx) and volatile organic compounds (VOCs)
- Ozone is a *regional* issue, and relocating the hot-mix asphalt plant will not substantially affect overall ozone production





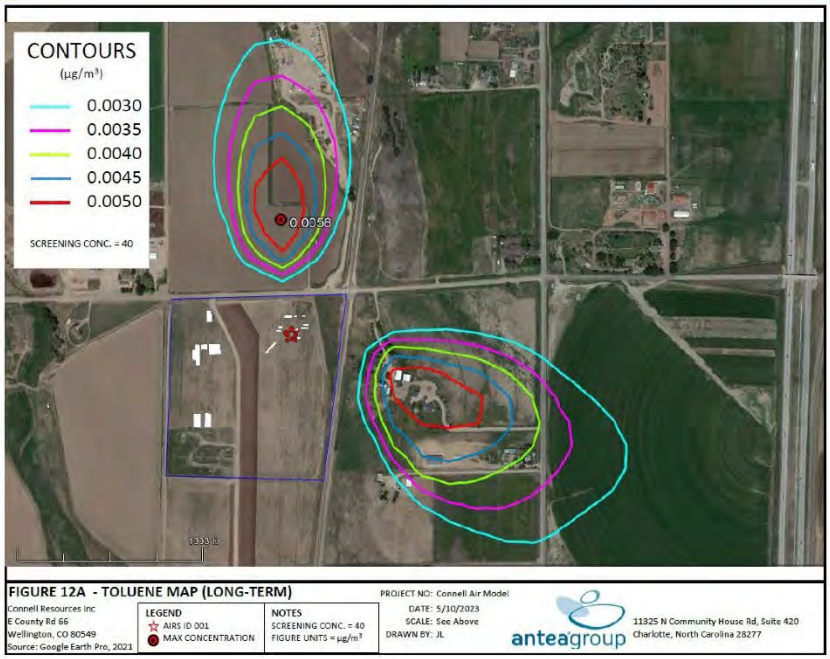
SANBORN HEAD

Image Sources: U.S. Environmental Protection Agency, Oklahoma Department of Environmental Quality

10

Air Modeling

- AERMOD – USEPA/CDPHE approved model
- Emission source – Aggregate dryer stack (red star)
- Results depict long-term (annual) impacts for toluene



SANBORN HEAD

11

Health Risk Assessment

- Incremental Cancer Risk
  - Chemicals known or suspected to cause cancer
  - Estimated as: Concentration in Air × Unit Risk Factor
  - Typical acceptable levels
    - 1 to 100 per million (10^{-6} to 10^{-4})
  - Background cancer incidence risks
    - Men: 41 per 100, or 410,000 per million
    - Women: 39 per 100, or 390,000 per million

SANBORN HEAD

https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2023/2023-cancer-facts-and-figures.pdf

12

Health Risk Assessment

- Incremental Cancer Risk Example
  - Assume: A site/project adds a 1 in a million incremental cancer risk
  - A person's chance of getting cancer would increase by the following amounts:
    - Man: From 410,000 per million to 410,001 per million
    - Woman: From 390,000 per million to 390,001 per million

SANBORN HEAD

https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2023/2023-cancer-facts-and-figures.pdf

13

Incremental Cancer Risk

Chemical	Highest Modeled Concentration ($\mu g/m^3$)	Inhalation Unit Risk ($m^3/\mu g$)	Incremental Cancer Risk (per million)
Acetaldehyde	0.0024	0.0000022	0.0053
Formaldehyde	0.0013	0.000013	0.017
Benzene	0.00051	0.0000078	0.0040
Ethylbenzene	0.004	0.0000025	0.010
PAHs - Benzo(a)pyrene	0.000000058	0.0006	0.000035
Total Incremental Cancer Risk (per million)			0.036

- Assumed exposure for 70 years
- Incremental risk of 0.036 per million is less than 1 per million *de minimis* risk
- Risks at park and school 8 and 11 times lower

SANBORN HEAD

14

Health Risk Assessment

- Hazard Quotient (HQ)
  - Address adverse health effects *other than cancer*
  - Calculated as: $$HQ = \frac{\text{Exposure Concentration}}{\text{Safe Concentration}}$$
  - Acceptable HQ = 1 if a single chemical
  - Add HQs together for multiple chemicals as a screening Hazard Index (HI)

SANBORN HEAD

15

Non-Cancer Hazard Quotients

Chemical	Highest Modeled Concentration (µg/m³)	Safe Concentration (µg/m³)	Hazard Quotient (HQ)
Acetaldehyde	0.0024	9	0.00027
Hexane	0.0017	700	0.0000024
Formaldehyde	0.0013	9.8	0.00013
Toluene	0.0056	5000	0.0000011
Quinone	0.00049	1	0.00049
Benzene	0.00051	30	0.000017
Ethylbenzene	0.004	1000	0.0000040
Xylenes	0.0049	100	0.000049
PAHs - Benzo(a)pyrene	0.000000058	0.002	0.000029
PAHs - Other	0.00042	3	0.00014
HCl	0.00038	20	0.000019
		Total Hazard Index	0.0012

- Safe concentrations from U.S. EPA and state databases
- Overall Hazard Index (HI) is 800 times smaller than acceptable value of 1
- HI's at park and school 9 and 10 times lower

SANBORN HEAD

16

Comparison to Background

Chemical	Highest Modeled Concentration (µg/m³)	NATA Background Concentration (µg/m³)	Percent of Background
Acetaldehyde	0.0024	0.64	0.4%
Formaldehyde	0.0013	0.73	0.2%
Benzene	0.00051	0.15	0.3%
Ethylbenzene	0.004	0.036	11%
PAHs (Total)	0.00042	0.0078	5.4%

- NATA = 2014 National Air Toxics Assessment (U.S. EPA)
- Background concentrations for Wellington census tract

SANBORN HEAD

17

Conclusions

- Emissions from the hot-mix asphalt plant will not present significant risks to human health
- Highest incremental modeled concentrations will be small compared to existing background levels (from other sources)

SANBORN HEAD

SANBORN HEAD

MEMORANDUM

To: John Warren
From: Stephen Zemba, PhD
File: 5838.00
Date: May 26, 2023
Re: Proposed Hot-Mix Asphalt Plant

Sanborn, Head and Associates, Inc. (Sanborn Head) has evaluated potential risks to human health associated with potential air pollutant emissions from the hot-mix asphalt plant (HMA) plant that Connell Resources proposes to build and operate in Wellington, Colorado. In conducting our review, we reviewed and built upon the results of the air quality assessment developed by the Antea Group (Antea) in their Refined Modeling Report dated May 18, 2023.

In summary, Sanborn Head's risk evaluation finds that pollutant emissions from the proposed hot-mix asphalt plant will not present significant health risks. The estimated incremental cancer risk is well below the 1 per million risk level considered *de minimis* by regulatory agencies. Additionally, the non-cancer hazard index is more than 800 times lower than 1, indicating no appreciable likelihood of adverse health effects. Impacts from facility emissions will in general lead to small increases to the background levels of pollutants in ambient air.

This memorandum is designed to accompany materials developed by Sanborn Head for presentation at a June 5, 2023 Community Meeting, providing notes, references, and supplemental information.

Presentation Slide #5 provides reference information for the Antea Group modeling report. An air dispersion modeling study is not typically required by the Colorado Department of Public Health and Environment (CDPHE) to obtain an air operating permit because HMA plants typically qualify as minor sources under CDPHE rules. Hence, Connell Resources voluntarily engaged Antea Group in developing the air quality assessment.

Presentation Slide #6 is a Google Earth map image that depicts the anticipated location of the dryer stack, which will be the main source of air pollutant emissions at the HMA plant. Also depicted are the locations of the three key potential receptors, locations at which Antea models pollutant concentrations in air due to HMA plant emissions. The nearest residence is located about 640 feet to the east-southeast of the proposed dryer stack. Sanborn Head understands that the Wellington Community Park and Eyestone Elementary School locations were considered based upon input from concerned citizens.

Presentation Slide #7 lists the air pollutants considered in the modeling study. Information on emissions of these pollutants is based on testing results from other HMA plants similar to that

proposed by Connell Resources, as provided in the US Environmental Protection Agency (US EPA) AP42 database and recent stack tests of HMA plants. Potential emission rates are based on HMA permitted production (300,000 tons/year); these potential emission rates will exceed actual emissions if the facility does not reach its permitted capacity. Criteria pollutants are subject to National Ambient Air Quality Standards (NAAQS), which are described and evaluated in Antea's report. Sanborn Head's risk evaluation focuses primarily on the so-called "air toxics," which are designated Hazardous Air Pollutants under the Clean Air Act. Sanborn Head understands that the list of key air toxics was provided by the Larimer County Health Department.

Presentation Slide #8 is a wind rose diagram of hourly meteorological data, as provided by Antea Group, which used the data as input to their dispersion modeling study. The petals/arms of the wind rose indicate directions from which winds originate. Winds blow from all directions, but the highest frequencies of winds in Wellington blow from north to south and north-northeast to south-southwest, in the general direction from the proposed HMA plant toward the most populated area of the Wellington community.

Presentation Slide #9 is a table from Antea's report that summarizes the highest modeled concentrations of the Criteria air pollutants in ambient air compared with their respective NAAQS. The NAAQS are issued by the US EPA as ambient concentration limits designed to protect human health. The incremental worst-case impacts from the HMA plant are small percentages of the NAAQS, and even if combined with the cumulative contributions from other sources, NAAQS are not likely to be exceeded.

Presentation Slide #10 addresses ozone (O_3), a pollutant of interest In Larimer County because monitored concentrations have shown exceedances of the USEPA's NAAQS. The proposed HMA plant will not directly emit ozone, but it will release nitrogen oxides (NOx) and volatile organic compounds (VOCs) that produce ozone from chemical reactions in the atmosphere. Ozone, however, is a pollutant that depends on regional emissions – in this case from the entire metropolitan Denver area. Since the HMA plant is being moved within the regional airshed, its NOx and VOC emissions should have no substantial impact on ambient ozone concentrations.

Presentation Slide #11 depicts Antea's air modeling results for toluene for the long-term (annual average) modeling period. The Antea Group report contains similar figures for all modeled pollutants, which principally differ in scale based on relative emissions of each pollutant. Each map of long-term averages indicates two regions of highest concentrations, one of which occurs to the north of the proposed HMA plant, and the other of which is predicted near the closest residence. Concentration predictions at the Wellington Community Park and Eyestone Elementary School (not shown on the map) are roughly ten times lower than the highest predicted concentrations.

Presentation Slides #12 and #13 discuss cancer risk, which is one of the two categories of health risks evaluated by Sanborn Head. The incremental cancer risk from exposure to an environmental project must be interpreted in the context of a person's "background" risk of

getting cancer, which is about 40% over one's lifetime (or 400,000 chances per 1,000,000). The additional risk of getting cancer from exposure to environmental pollutants is typically considered acceptable if within the range of 1 to 100 extra chances per 1,000,000 (which adds to the background risk), and is typically considered to be of de minimis concern if less than 1 per 1,000,000.

Presentation Slide #14 presents Sanborn Head's evaluation of incremental cancer risk from potential exposure to air pollutants from the proposed HMA plant. The estimates are based on the highest annual average concentrations estimated in Antea's modeling study, and exposure is assumed to occur over a period of 70 years. The portion of polycyclic aromatic hydrocarbons (PAHs) assumed to cause cancer is estimated from US EPA emission factors for benzo(a)pyrene and related compounds (https://www3.epa.gov/ttnchie1/ap42/ch11/final/c11s01.pdf). The Unit Risk factors that characterize the cancer-causing potential of the pollutants known or suspected to cause cancer are obtained from the US EPA Regional Screening Level (RSL) database (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables). The resulting cancer risk estimate, added over all pollutants, is well below the 1 per 1,000,000 *de minimis* risk level.

Presentation Slide #15 presents the calculations used to assess potential health effects other than cancer. This assessment involves the calculation of hazard quotients (HQs), which are ratios of exposure (air pollutant concentrations in air) divided by reference (safe) concentrations (RfCs). RfCs are derived by the US EPA and other regulatory authorities as concentrations that can be safely breathed over time with no appreciable risk of any adverse effects on health.

Presentation Slide #16 presents the details of the non-cancer risk evaluation. The safe concentrations are taken from the US EPA RSL database (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables), except for the value for quinone (not available from the US EPA), which is taken from the New Hampshire Department of Environmental Services (https://www.des.nh.gov/air/industrial-sources/air-toxics-compliance). PAHs are evaluated in two groups based on consideration of US EPA emission factors and similarity to benzo(a)pyrene (https://www3.epa.gov/ttnchie1/ap42/ch11/final/c11s01.pdf). The total hazard index, or sum of the hazard quotients for each pollutant, is more than 800 times smaller than the typically acceptable limit of 1.

Presentation Slide #17 compares the incremental worst-case estimates of air pollutant concentrations likely to result from emissions from the proposed HMA plant to background concentrations already present in air due to emissions from other manmade and natural sources. Background concentrations are specific to the Wellington census tract and are taken from the US EPA's National Air Toxics Assessment (https://www.epa.gov/national-air-toxics-assessment/2014-nata-assessment-results). As indicated, the proposed HMA would increase the concentrations of air toxics only by small percentages.

Presentation Slide #18 provides summary conclusions. Sanborn Head's evaluation indicates that pollutant emissions from the proposed HMA plant will not significantly contribute to adverse health effects to individuals in the Wellington community.

SZ/SEP: sz

P:\5800s\5838.00\Source Files\Risk Assessment Memo.docx

STEPHEN G. ZEMBA, PHD, PE
Project Director

KEY AREAS OF PRACTICE

Health Risk Assessment

EDUCATION

Ph.D., Mechanical Engineering, Massachusetts Institute of Technology, 1989

M.S., Mechanical Engineering, Massachusetts Institute of Technology, 1985

B.S. with University Honors, Mechanical Engineering, Carnegie-Mellon University, 1983

REGISTRATIONS / CERTIFICATIONS

Professional Engineer – MA

PROFESSIONAL AFFILIATIONS

Member, Air and Waste Management Association

Environmental Business Council of New England

SANBORN HEAD

Since 2015

Steve has more than two decades of experience assessing risks of environmental chemicals. His projects include fate-and-transport modeling, exposure assessment, and both human health and ecological risk assessments. He has consulted for both private and public sector clients, and provided expert testimony at hearings and in litigation support.

Steve also teaches university-level courses on air quality management and air pollution control. He has presented projects and research at numerous conferences on topics including acid rain, dense gas plume dispersion, indoor air quality and dispersion modeling, ocean disposal of carbon dioxide, multi-pathway risk assessment, methods to estimate exposure point concentrations, vapor intrusion, landfill gas, and environmental applications of decision analysis methods.

RELEVANT EXPERIENCE

Collins & Aikman Superfund Site, Farmington, NH

As part of the Sanborn Head team, led the development of the baseline human health risk assessment for the site. While chlorinated solvents in groundwater have been the focus of the site investigation, metals and polycyclic aromatic hydrocarbons in soil have also merited consideration in the risk assessment, with differentiation of background an important component.

Technical Assistance, PFAS Air Deposition Review, NH DES

Assisted Sanborn Head's review of the investigation of a large air deposition site involving per- and polyfluoroalkyl substances (PFAS). Commented on the methods and assumptions used by the potentially responsible party for estimating emissions and deposition of PFAS to soils, and subsequent leaching to groundwater.

Four Hills Landfill Air Permitting, Risk Assessment, Nashua, NH

Designed and helped conduct a risk assessment of formaldehyde emissions from energy recovery engines operated at the landfill. Initial dispersion modeling determined exceedances of the state's ambient air limits. A site-specific risk assessment was thus conducted to derive a health-protective emission limit for formaldehyde, and subsequent engine testing was able to demonstrate compliance.

Vermont Department of Environmental Conservation, PFAS Pollution Prevention (P2) Project, VT

Sanborn Head is assisting the Vermont DEC on its PFAS Pollution Prevention Project. The project is designed to identify uses of per- and polyfluoroalkyl substances (PFAS) in metal finishing and aerospace industries and to identify opportunities to reduce releases of PFAS to the environment. Sanborn Head is involved in the development of sampling plans, process evaluation, and identification of PFAS-containing products and potential substitutes.

Ecological Evaluation of PFAS Toxicity and Bioaccumulation, Confidential Client

Prepared an ecological risk evaluation of PFAS contamination at a former military installation on behalf of a confidential client. Repeated application of aqueous film forming foam (AFFF) at a firefighting training area, as well as AFFF applications in response to specific incidents, led to PFAS contamination in soils, sediment, and groundwater. The residual contamination continues to discharge to surface water. Compared contaminant levels to ecological screening criteria to characterize potential risks to aquatic plants and animals. Also evaluated the potential for PFAS to

bioaccumulate from surface water and sediment into plants, shellfish and other macroinvertebrates, and fish. Modeled concentrations in biota were compared with site specific data as an initial evaluation of potential bioaccumulation resulting from exposure PFAS through the aquatic environment.

NEWSVT, 2018 Phase VI Expansion Permitting, Coventry, VT

Assisted with the evaluation of per- and polyfluorinated alkyl substances (PFAS) in leachate and the implications of its disposal at wastewater treatment plants.

NEWSVT, Scope of Services for 2019 PFAS Waste Source Testing, Coventry, VT

Oversaw the implementation of a phased program of sample acquisition and laboratory analysis of targeted waste streams disposed at the NEWSVT Landfill, with reporting of results to VTDEC. Presented data at the EREF PFAS symposium.

Vapor Intrusion Litigation Support, Industrial Facility, MI

Reviewed site history to determine if underground storage tank investigations were conducted according to regulatory guidance and whether data were collected to identify the potential for vapor intrusion from chlorinated solvent compounds. Helped to review co-located groundwater, soil-gas, and indoor air data to assess the degree of vapor intrusion at off-site residential locations.

Fugitive Dust Evaluation, Industrial Facility, OH

Oversaw expert technical assistance in the area of fugitive dust assessment and the relationship between fugitive dust emissions and concentrations of lead measured in ambient air. Recommended measures to mitigate dust emissions and lead exposure.

Litigation Support, Sterigenics Facility, Willowbrook, IL

Assisted the Illinois Attorney General's office in evaluating residential exposure to ethylene oxide (EtO) released from operation of a medical equipment sterilization plant. Used measurements collected by the USEPA to develop estimates of background exposure levels to distinguish impacts from facility-related EtO emissions.

PFAS White Paper, New York, NY

Assisted a confidential client in the estimation of future liabilities that might result from the mitigation of per- and polyfluorinated substances (PFAS) in the environment. The scope of the analysis included assessment of the magnitude of drinking water impacts across the nation and the potential costs of treatment, remediation, and compliance monitoring.

Multi-Pathway Risk Assessments of Waste-to-Energy and Other Facility Stack Emissions, Various Locations

Coordinated and designed multi-pathway risk assessments of stack emissions from waste-to-energy plants, cement kilns, and hazardous waste incinerators in Biddeford, Maine, Harrisburg, Pennsylvania, and Greencastle, Indiana, Harriman, New York, and the Setubal Peninsula, Portugal, as well as proposed facilities in East Bridgewater, Massachusetts and Green Island, New York. Also provided technical support for the Town of North Kingstown in evaluating the proposed waste-to energy facility at Quonset Point, Rhode Island.

ITRC PFAS Team

Assisting with the writing of the PFAS fate-and-transport fact sheet and the incorporation of information on the role of atmospheric transport and deposition of PFAS as a potential source of groundwater contamination in the vicinity of factories that used PFAS in manufacturing processes.

PFAS in Vermont Soils

Helped to design and implement a study to measure background levels of perfluoroalkyl substances (PFAS) in surface soils in Vermont. Collaborating with the University of Vermont, samples were collected from 66 locations across the state at public parks, greens, school grounds, and other areas with no known local sources of PFAS. PFNA and PFOS were found in all samples, and 6 other compounds were detected in 70% or more of all samples. The findings suggest that low levels of PFAS may be ubiquitous in soils, with the likely source due to long-range transport and atmospheric deposition.

Technical Assistance Grants (TAGs) Support, New England Superfund Sites

Assisted several citizens' groups under TAGs projects typically involve review of remedial investigation reports and feasibility studies, with specific attention to human health and ecological risk assessments, to help citizens understand the nature of potential risks and to develop comments on technical work. Continues to advise the Wilmington Environmental Restoration Committee on the investigation of the Olin Chemical Site in Wilmington, MA, focusing on dense aqueous phase contamination of groundwater and the presence of *n*-nitrosodimethylamine and numerous other chemicals. While at a previous firm, assisted the Seacoast Citizens Overseeing Pease Environment in reviewing risk assessments of groundwater and soil contamination found at the former Pease Air Force Base (Portsmouth, NH), including chlorinated solvent plumes. Provided similar TAG support to the Aberjona Study Coalition (Industri-Plex Site, Woburn, MA), Four Town Focus (former Fort Devens Annex, Sudbury, MA), and the Advocates for Rockland, Abington, Weymouth, and Hingham (former South Weymouth Naval Air Station, MA).

Fugitive Dust Evaluation, Petroleum Coke Facility, IL

Assisted the City of Chicago with the third-party evaluation of fugitive dust emissions from a petroleum coke (petcoke) storage facility and led a study of potential dust emissions from the facility that indicated the importance of control measures.

Environmental Evaluation of Omya Verpol Facility, VT

As Project Manager, led the most extensive environmental and public health evaluation of any facility in Vermont. Under intense public scrutiny, the 18-month study shed new light on the largest calcium carbonate ore-processing plant in North America. The project team reviewed existing environmental data, identified data gaps, and conducted additional investigations. Additional activities included drilling monitoring wells, identifying preferred analytical methods for detection of process chemicals in environmental samples, conducting a dust monitoring study, assessing emissions to air of potentially hazardous chemicals, surveying local aquatic systems receiving industrial or quarry discharges, developing drinking water guidelines for process chemicals, monitoring noise levels around the facility, and assessing the impacts of the plant operations on public health.

PCBs Indoor Air Assessments

As Risk Assessor, has participated in several health risk evaluations associated with polychlorinated biphenyls (PCBs) that remain present in pre-1980 building materials such as caulking compound and fluorescent light ballasts. In one study, evaluated worker exposure to airborne sawdust generated from cutting floorboards stained with PCB oils and found modeled breathing zone concentrations to be lower than occupational exposure limits. In a second study, assisted in the evaluation of PCB exposure at a daycare center. PCB concentrations in indoor air exceeded EPA's protective Public Health Levels (PHLs), but exposure was found to be many times smaller than the background level received by nursing infants, suggesting a low

probability of adverse health effects. In a third study, assisted a client in converting an industrial building for residential use. PCBs present in concrete floors cannot be removed in a cost-effective manner. Flux chamber measurements were conducted that demonstrate a low rate of PCB off-gassing, and a subsequent health risk assessment indicated that the floors can remain place and present no significant health risks to future residents.

Project Manager, Municipal Solid Waste Landfill Risk Assessments, Various New England Locations

As Project Manager, designed the scope of the risk assessment of the City of Manchester Municipal Landfill and performed fate and transport modeling of the volatilization of organic chemicals from surface waters, along with subsequent atmospheric dispersion modeling. Designed and conducted Cumulative Impact Assessment risk characterizations of landfill gas and dust emissions for solid waste management facilities in Fitchburg, Chicopee, Taunton, Bourne, Fall River, Granby, and Marion, Massachusetts. Evaluated long-term risks to human health potentially associated with the proposed expansion and development of the Crossroads Landfill in Norridgewock, Maine.

200 Presidential Way, Human Health Risk Assessment, Woburn, MA

Led and helped to develop a focused human health risk assessment of a portion of the Industri-Plex Superfund Site. U.S. EPA required a detailed risk screening of soils and groundwater as the area was slated for residential development. The focused risk assessment demonstrated no significant health risks to future residents at the site.

Proposition 65 Assessments, Green Toxicology, Brookline, MA

Conducted Proposition 65 Assessments of rubber products developed from recycled tires. The rubber products named in the Proposition 65 notice (which may be sold in California) are used for a number of purposes such as landscaping mulch, playgrounds and equestrian arena fill. Supported the client by identifying materials to be evaluated and documented similarities and differences (e.g., in coatings or additives) and evaluated the effect of any differences on the analysis. Identifying end users and product interaction was an important part of the project. Reviewed the measured chemicals in the products and compared it to the Proposition 65 list. In addition, he evaluated relevant toxicological properties and compared the results of the exposure estimates with relevant NSRLs and MADLs or equivalents and assisted legal counsel in evaluating the need for any warning labels. All parts of the assessments were documented to a standard allowing independent review and replication, suitable for submission to California authorities to demonstrate compliance with Proposition 65.

Consequence Modeling, Expert Witness Services, Town of Hopkinton, MA

Reviewed a worst-case study of dense vapor formation and dispersion due to potential spills of liquefied natural gas (LNG) from a peak shaving facility. He provided the Town with expert advice at public meetings and testified on the Town's behalf at a state Department of Public Utilities hearing on an application by the facility owner to upgrade the facility, stating that improved communication between the Town and the facility would be useful for improving emergency response planning.

MGM Springfield Casino, MCP Compliance, Springfield, MA

Provided expert risk assessment for the construction of the MGM Springfield Casino. Reviewed data and developed risk-based concentrations for workers and others in the area. Provided MCP risk calculations, developed a risk assessment report to support a comprehensive RAM Plan for the project.

88 Ames Street, Risk Assessment Services, Cambridge, MA

Provided risk assessment services for this high-rise redevelopment project in a highly urban setting. Conducted risk calculations for workers and trespassers and developed a risk assessment report addressing CVOCs in fill soil and groundwater.

Southbridge Recycling & Disposal Park, Landfill Air Permitting, Southbridge, MA

Assessed multiple phased double-lined solid waste facility expansion project. Examined formaldehyde concentrations at monitoring locations and developed an air pathway exposure model. In addition, has developed a formaldehyde risk assessment report and has been involved in reviewing the air permit protocol.

BPR Sudbury Development, Risk Assessment, Sudbury, MA

Supported the design of building additions and improvements to the proposed Wastewater Treatment Plan. Conducted risk assessments of potential contaminants in excavation trenches possible during geotechnical subsurface explorations.

Air Emission Services, Expert Witness Services, City of Haverhill, MA

Dr. Zemba a reviewed an application filed by an industrial facility seeking to increase its processing throughput. He examined the detailed calculations submitted by the applicant and the likely changes in air pollutant emissions. His report and public hearing testimony informed the Board of Health's positive determination and approval of the project.

Litigation Support

Attleboro Sand & Gravel, Concrete Batch Plant Evaluation, Expert Witness, Attleboro, MA

Evaluated the potential for the facility to cause conditions of air pollution that could be significantly hazardous, offensive, or detrimental to nearby neighbors. He developed and offered an expert opinion on the likely air quality impacts of the proposed concrete batching plant.

Air Emission Services, Litigation Support, Dupage County, IL

Reviewed data of the U.S. EPA on extensive test data from hot mix asphalt plants and health hazards. Assessed potential air quality and human health impacts of emissions from a particular plant and determined that air quality will not present significant health risks to nearby residents

Asbestos Risk Assessment, Litigation Support, St. Louis, MO

Assessed potential exposure to asbestos fibers that may have been released from the asbestos cement pipe plant. Developed an estimate of the level of exposure to asbestos received by the client due to potential emissions of asbestos fibers from the pipe manufacturing plant. Reviewed information about the St. Louis facility and the means by which asbestos may have been released to the atmosphere, building on work done in a previous case.

Passaic River Superfund Site, Litigation Support, NJ

Assisted with support to a potentially responsible party (PRP) with ongoing litigation regarding the Passaic River Superfund site. Participated in a broad review of the sediment data available and critically reviewed/critiqued the baseline risk assessment for the eight plus mile stretch of the Passaic targeted for dredging. Assisted with the evaluation of the PRP's potential releases of contaminants of concern (COCs) to the river., and also assisted with file reviews for many of the other PRP properties along the River, to assess the contributions of these other properties to the contaminants driving the need for remediation of the River

NH Dioxane Site, Litigation Support, Hampstead and Atkinson, NH

Assisted with litigation support by reviewing data regarding the 1,4-dioxane detected in several dozen residential wells that prompted an extensive NHDES groundwater investigation and a Time Critical Removal Action by the USEPA under the Superfund Program. Specifically assisted with the review of an evaluation of potential 1,4-dioxane sources other than the client's former facility and conducted an assessment of how the extent of contamination may change in the future, impacting the lowering of the 1,4-dioxane and the reasonableness of the USEPA's approximately $4 million claim against the client.

Crude Oil Loading Litigation Support, Portland, ME

Provided litigation support to the City of South Portland, Maine, regarding the air quality impacts associated with bulk petroleum loading and transport. In developing an expert report/opinion, he reviewed documents, analytical data land use maps/photos, regulatory agency files and permits and evaluated data and performance of engineering/scientific analyses or calculations. His expert report focused on short-term odor, SO_2, and NOx impacts, and provided trial testimony regarding air pollutant emissions resulting from the loading of crude petroleum oil onto marine vessels, and also from breathing and filling losses from a petroleum tank farm.

Prior to Sanborn Head

Emergency Response Planning for Oil Well Exploration

As Risk Assessor, assisted petroleum industry clients to evaluate hazards associated with potential well blowouts. Under certain circumstances, blowouts can release substantial quantities of oil and gas, and result in heavier-than-air mixtures with toxic levels of hydrogen sulfide (H_2S).

Releases in mountainous terrain can channel the heavy gas, potentially endangering inhabitants over distances of several miles. Recognizing the limitations of standard heavy gas models, applied computational fluid dynamics (CFD) software to simulate the behavior of well blowout releases. Predicted H_2S concentrations have been used by clients to develop contingency measures for responding to inadvertent blowout releases.

Environmental Risk Assessment and Decision-Making Support for the U.S. Army Corps of Engineers, MS

As Project Manager, coordinated the development of a prototype decision support tool that integrated environmental models with decision analysis methods to formally and transparently evaluate tradeoffs and uncertainties regarding environmental resource management. The prototype decision support tool integrated Army Corps of Engineers and U.S. Environmental Protection Agency (EPA) environmental models within a Geographic Information System (GIS) framework to provide a powerful system of models for assessing the impacts of multi-media environmental contamination over varying spatial and temporal scales, with a direct linkage to a decision support module.

Risk Assessments of Hazardous Waste Disposal Sites, MA

As Project Manager, conducted numerous risk assessments of hazardous waste disposal sites in accordance with the Massachusetts Contingency Plan and federal Superfund guidance. The contamination at one site — a former jewelry manufacturing facility — included many heavy metals and several volatile organic compounds associated with solvent use. The assessment of a petroleum tank farm required consideration of the ecological consequences of potential discharges to an adjacent

river. Another large site required a detailed exposure assessment involving eight age groups (infants through senior citizens) and seven hypothetical receptors (residents, workers, and visitors/trespassers).

Technical Assistance, Massachusetts Communities Monitoring Superfund Site Cleanups

As Project Manager, provides ongoing technical assistance to three citizen groups – the Aberjona Study Coalition, the Wilmington Environmental Restoration Committee, and the Advocates for Rockland, Abington, Weymouth, and Hingham – who monitor the cleanup of Superfund sites in Massachusetts. The projects are funded by citizens groups who have received Technical Assistance Grants (TAGs) from the U.S. Environmental Protection Agency (EPA). The projects involve reviews of remedial investigations, feasibility studies, human health and ecological risk assessments, proposed plans, records of decision, and other related documents. Works to communicate technical findings to the citizens groups and the interested public through meetings and presentations and assists the groups to develop and submit comments to EPA.

Instructor, Universities and Professional Organizations

In addition to environmental consulting, teaches courses in air pollution and air dispersion modeling at Tufts University, the University of Massachusetts Lowell, and (formerly) the Massachusetts Institute of Technology. Since 1992 has mentored more than 200 students in over 20 courses, has co-taught numerous risk assessment and risk management courses for the Massachusetts Licensed Site Professional Association, and has conducted workshops in multi-pathway risk assessment at conferences sponsored by the Society for Risk Analysis and International Society of Exposure Science.

Deep Ocean Disposal of Carbon Dioxide, U.S. Department of Energy

Research Engineer for a research team that performed one of the first evaluations of the physical and environmental consequences of ocean disposal of carbon dioxide (CO_2). Developed mass transfer calculations to demonstrate that bubbles formed by the injection of CO_2 into the deep ocean could dissolve and remain sequestered. Potential formation of hydrates, however, could blanket the ocean bottom and adversely affect deep ocean ecology.

Atmosphere to Ocean Deposition of Contaminants, Massachusetts Bays Program

As Research Engineer, participated in a University of Massachusetts Lowell research study to evaluate contaminant deposition from the atmosphere to the Massachusetts Bays and developed estimates of atmospheric deposition of nitrogen containing compounds, mercury, and polycyclic aromatic hydrocarbons to the Massachusetts Bay.

Vapor Intrusion Evaluation, Raritan Arsenal, NJ

As Project Manager, evaluated the potential migration of contaminants from groundwater to indoor air at the Former Raritan Arsenal in New Jersey. Also reviewed indoor air data, applied modeling algorithms to evaluate vapor transport from groundwater to indoor air, and developed groundwater and soil-gas screening levels that would be protective of indoor air. The work supported the U.S. Army Corps of Engineers' proposed approach for evaluating potential indoor air quality impacts at the Former Raritan Arsenal due to vapor intrusion.

MATES-II Review, Federal Highway Administration (FHWA)

As Risk Assessor, team evaluated the Multiple Air Toxics Exposure Study (MATES-II) and found uncertainties ranging over many orders of magnitude uncertainty in its risk

estimates. A second bias typical of air toxics risk assessments is the assumption that current air quality will remain similar indefinitely (e.g., for a period of 70 years) despite projections that air quality will continue to improve. The findings afforded FHWA a more thorough understanding of the risks associated with highway vehicle emissions, which is expected to enable better informed decisions regarding the development of the nation's transportation infrastructure.

Health Risks Due to Transportation Emissions, Transportation Research Board (TRB)

As Project Manager, contributed to two research studies funded by the TRB. In one project, developed metrics to allow for more meaningful comparisons of the health benefits of proposed transit projects, expanding the typical quantification of changes in project emissions to include population and meteorological variables. In a second project, applied the U.S. EPA's AERMOD system to estimate ambient impacts from a proposed consolidation and renovation of an Intermodal Freight Terminal. AERMOD's area source algorithms were found to be advantageous for representing intermodal emission sources, but less convenient than traditional line source models for simulating roadway emissions.

Third-Party Review of a Proposed Hot-Mix Asphalt Plant, Uxbridge, MA

As Project Manager, coordinated and performed portions of an in-depth evaluation of hazard, nuisance, and danger issues associated with the operation of a hot mix asphalt production facility proposed for Uxbridge, Massachusetts. The final results study found that, as with any industrial facility, the potential for hazard, danger, and nuisance conditions does exist with the proposed facility; however, it should be possible to build and operate a plant such that hazards and dangers are minimal, and nuisance conditions are infrequent, although some issues, such as noise, may require substantial mitigation measures. The evaluation concluded that if the plant was built, several safeguards and protocols should be made conditions of approval (such as formal limits on the hours of operation to eliminate concerns about nuisance noise after the normal workday). It was determined that the best chance for a successful plant would be a mediated and/or negotiated approach in which stakeholders — the proponent, the Town, neighbors, and citizens' groups — work cooperatively during planning, construction, and operational phases (including ongoing efforts beyond startup).

RCRA Hazardous Waste Listing, BASF Corporation

As Project Manager, performed fate-and-transport modeling to predict evaporation rates of volatile chemicals from surface water impoundments at chemical manufacturing facilities in New York and West Virginia, with subsequent modeling to predict potential exposure point concentrations in ambient air. The analyses supported the demonstration that certain dye wastes proposed for listing as hazardous wastes under the Resource Conservation Recovery Act did not present significant health risks.

Record of Decision Review, Sullivan's Ledge Landfill Superfund Site, New Bedford, MA

As Project Manager, evaluated the remedial investigations and feasibility studies of the Sullivan's Ledge site and the Middle Marsh operable unit and proposed alternative interpretation of the data collected during the field studies. The analysis included in-depth analysis of proposed sediment quality criteria designed to protect mink from excessive exposure to polychlorinated biphenyls (PCBs). Absence of a sustainable fish population indicated the assumed principal means of the mink's exposure to PCBs was unfounded, and hence proposed cleanup criteria were overly protective.

Asbestos Cement Pipe Manufacturing in Riverside and Santa Clara, CA

As Project Manager and Expert Witness, conducted retrospective exposure studies to evaluate claims that a former manufacturer of cement pipe exposed neighbors to excessive levels of asbestos (used as a component of the pipes). Developed emissions and dispersion analyses to estimate concentrations of airborne asbestos at locations in communities surrounding the manufacturing facilities and testified as an expert witness in several cases related to these matters.

Facility Siting Hearings, Various Cities and Towns in MA

As Project Manager, testified at public meetings and hearings on findings of the likely environmental impacts of proposed solid waste landfills, recycling facilities, biomass-to energy plants, and hot-mix asphalt plants. Conducted studies of the chemicals likely to be released from these facilities and evaluated potential health risks to people living and working nearby.

Development of Risk-Based Standards for Compost, Nantucket, MA

As Senior Engineer, participated in the development of standards for compost produced from advanced processing of municipal solid waste (MSW). State regulatory authorities demanded extensive testing of the MSW derived compost, including analysis for a wide range of organic and inorganic contaminants. Worked interactively with the project team, client, and regulators and helped to develop acceptable risk-based standards for a wide variety of chemicals identified in the compost.

Chattanooga Air Toxics Study, Tennessee

As Project Manager, designed and coordinated the human health risk assessment for the Chattanooga Air Toxics Study (CATS), a year-long monitoring study of potentially hazardous air pollutants in mixed-use Chattanooga neighborhoods. The project team worked closely with the U.S. EPA Region 4 Project Manager to develop and execute the protocol for the risk assessment in the absence of definitive regulatory guidance, while simultaneously meeting stringent budget, time, and quality assurance constraints. The project team processed and analyzed an extensive database of ambient air toxics measurements involving hundreds of samples and chemicals. A distinguishing factor of the Study was its incorporation of Superfund risk methodologies, a novel application in air toxics risk assessment that compensated for a void in established risk assessment guidance.

Plainville Landfill Comprehensive Site Assessment Risk Evaluation, MA

As Project Manager, designed, managed, and conducted portions of a complex human health and ecological risk assessments for the Plainville Landfill in Massachusetts. Under considerable public pressure and scrutiny, Allied Waste Systems asked project staff to evaluate health risks associated with intense odors experienced by nearby residents due to emissions from its landfill. The project team helped the landfill owner establish a novel monitoring system capable of real-time measurements of hydrogen sulfide (a marker for landfill gas) and develop an approved plan to collect additional data for the health evaluation. Data was collected while the landfill worked to mitigate the source of its odors and was subsequently used to develop an acute health risk evaluation. This effort served as the first of several tasks needed to satisfy regulatory requirements.

The project developed into a large, multi-task project of complicated scope. The project team developed a comprehensive risk characterization focusing on both human health and the environment, working with third-party contractors to ensure collection of proper data to assess contaminant releases to air, groundwater, and surface water/sediment. The work required frequent interaction with stakeholders,

including careful development of protocols to bridge gaps in regulatory guidance and effective communication with concerned citizens. Methods for the assessment of health risks from landfill gas emissions were later used in part as a model by the Massachusetts Department of Environmental Protection to develop Cumulative Impact Assessment guidance for solid waste facilities.

PUBLICATIONS AND PRESENTATIONS

Zemba, S., Abell, R., and Ashton, A., Invited presentation to the Ohio Utilitied Group, Columbus, OH, December 2022.

Zemba, S. and Roakes, H., "PFAS Cycling Between Landfills and Wastewater Treatment Plants," Sanborn Head & Associates sponsored webinar (RCEP credit), November 30, 2022.

Zemba, S., "PFAS in Landfills (and elted topics), Environmental Business Council of New England webinar, November 15, 2022.

Zemba, S. and Snay, T., "PCBs – Re-Emerging Contaminants," AEHS 38th Annual International Conference on Soils, Sediments, Water, and Energy, Amherst, MA, October 18, 2022.

Morzuch, B., Roakes, H., and Zemba, S., "Environmental Data Analysis and MCP Risk Assessment Statistics with ProUCL," Licensed Site Professional Association course, November 1, 2022.

Zemba, S., "PFAS at Brownfields Sites," Northeast Sustainable Communities Workshop, September 13, 2022.

Zemba, S., "Perspectives on PFAS Health Effects," New England Water Works Association (NEWWA) Annual Conference, Newport, RI, September 21, 2022.

Zhu, W., Khan, K., Roakes, H., Maker, E., Underwood, K., Zemba, S., and Badireddy, A., "Vermont-wide assessment of anthropogenic background concentrations of perfluoroalkyl substances in surface soil," *J Haz Materials* **438**:129479, September 2022.

Abell, R., Thurlow, M., Zemba, S., "PFAS: State Regulation, Private Litigation, Updated Scientific Analysis, Risks and Liabilities," Strafford CLE Webinar, August 17, 2022.

Damiano, L. and Zemba, S., "Renewable Natural Gas: The Future of Landfill Gas Energy Recovery?," Air & Waste Management Annual Conference and Exhibition, San Francisco, CA, June 29, 2022.

Zemba, S., "PFAS Emissions to Ambient Air from Landfills," Air & Waste Management Annual Conference and Exhibition, San Francisco, CA, June 29, 2022.

Zemba, S., "PFAS Issues Facing Landfills," Invited presentation to the New Hampshire Solid Waste Working Group, May 27, 2022.

Zemba, S., "How Significant are PFAS Emissions to Ambient Air from Landfills?," Federation of New York Solid Waste Associations Conference May 23, 2022.

Zemba, S., "PFAS at Brownfields: The Role of Risk Communication,", Northeast Waste Management Officials' Association, Revitalizing New England: Brownfields Summit 2022, May 18, 2022.

Brown, L. and Zemba, S., "PFAS: Responding to Orders to Investigate and Increasing State and Federal Scrutiny," Strafford CLE Webinar, April 12, 2022.

Zemba, S., "PFAS: Trends and Issues for the Oil & Gas Industry", Moderator, 4C Conference, April 7, 2022.

Zemba, S., "PFAS and Brownfields," Moderator of Workshop sponsored by the Brownfields Coalition of the Northeast, Lebanon, NH, March 31, 2022.

Roakes, H. and Zemba, S., "PFAS and the Environment: Importance of Mass Fluxes and Balances," ASCE New Hampshire Section Webinar, March 22, 2022.

Zemba, S., "PFAS Issues Facing Landfills," Global Waste Management Symposium, Indian Wells, CA, February 15, 2022.

Zemba, S., "PFAS Developments", Invited Speaker, Brownfield Coalition of the Northeast Regulatory Update, November 16, 2021.

Zemba, S., "PFAS Update – Impact on Redevelopment Projects", Invited Speaker, Brownfield Coalition of the Northeast 2021 Sustainable Communities Workshop, October 26-27, 2021.

Zemba, S., "Perspectives on PFAS – Importance of Mass Fluxes and Balances", 37th Annual International Conference on Soils, Sediments, Water, and Energy (virtual), October 2021.

Zemba, S. & Shea, D., "PFAS Vapor Intrusion: Really a Concern", Air & Waste Management Association's Advancements in VI and Emerging Contaminant Air Quality Issues Virtual Conference, September 2021.

Zemba, S., Delude Roy, N., and Cooper, Ivan A., "Episode 102: Beyond the Basics of PFAS", Waste360's NothingWasted! Podcast, April 5, 2021.

Zemba, S., "Introductions to Short Forms for Human Health Risk Assessment", Licensed Site Professionals Association webinar, March 2021.

Zemba, S., "The Basis of PFAS Standards," Invited Speaker, Vermont Environmental Consortium (VEC) 9th Annual Conference (virtual), October 27, 2020.

Zemba, S., Pope, S., Badireddy, A., "Ecological Risk and Bioremediation of Per- and Polyfluoroalkyl Substances", Scientific Journal of Biology & Life Sciences, October 20, 2020.

Zemba, S., "Surface Water Standards: The Next PFAS Challenge?", AEHS 36th Annual International Conference on Soils, Sediments, Water, and Energy, Amherst, MA, October 2020.

Estabrooks, M., and Zemba., S., "PFAS Study of Solid Waste Materials," Federation of NY Solid Waste Associations Virtual Conference, October 15, 2020.

Zemba, S., "PCBs in Building Materials and Indoor Air Exposure/Health Risks." PCBs in Building Products: Implications for Brownfields (webinar), Northeast Waste Management Officials' Association (NEWMOA), October 14, 2020.

Zemba., S., "PFAS Sequestration and Retention for Landfill Leachate." The Science of PFAS: Chemistry, Health, and Multimedia Measurements, Virtual Conference, Air & Waste Management Association, September 16, 2020.

Zemba, S., and Roy, N., "Beyond the Basics of PFAS," WasteExpo Together Online Conference Session, September 16, 2020.

Zemba, S., Air Emissions/Deposition as a Potential Pathway to Groundwater Contamination. PFAS and Related Compounds Workshop, American Groundwater Trust, New Jersey/Maryland/Delaware PFAS Webinar, September 2, 2020.

Roakes, H. and Zemba, S., "PFAS Updates: PFAS Fate & Transport Characteristics and Remediation Alternatives", RCEP Presentation for ACEC-NH, August 28, 2020.

Zemba, S., Air Emissions/Deposition as a Potential Pathway to Groundwater Contamination. PFAS and Related Compounds Workshop, American Groundwater Trust, Georgia-Florida PFAS Webinar, August 10, 2020.

Zemba, S., "PFAS in New Hampshire: The Latest Developments", Alpha Analytical Webinar, July 28, 2020.

Abell, R., Brown, M., Thurlow, M., Zemba, S., "PFAS: State Regulation, Private Litigation, Recent Science, and Risks and Liabilities," Strafford CLE Webinar, July 15, 2020.

Zemba, S., "PFAS Emissions from Air to Landfills," EBC Solid Waste Management Webinar, Update to the Solid Waste Industry, Environmental Business Council of New England, July 14, 2020.

Zemba, S., "Technology Overview: Methods for Assessing Health and Environmental Risks of Organic Micropollutants in Biosolids", Mid-Atlantic Biosolids Association Webinar, July 9, 2020.

Zemba, S., Air Emissions/Deposition as a Potential Pathway to Groundwater Contamination. PFAS and Related Compounds Workshop, American Groundwater Trust, Northwest PFAS Webinar, June 24, 2020.

Roakes, H. and Zemba, S., "PFAS Exchange between Landfills and Wastewater Treatment Plants – The PFAS Cycle?", EM – The Magazine for Environmental Managers, May 2020.

Zemba, S., "PFAS: Responding to Orders to Investigate and Increasing State and Federal Scrutiny", Strafford CLE Webinar, April 8, 2020.

Zemba, S., "PFAS Cycling Between Landfills and WWTPS", EBC Emerging Contaminants Seminar, Framingham, MA, February 25, 2020.

Zemba, S., "PFAS: Treading Dark Waters," presented at The Remediation Managers Roundtable Group, Bowling Green, FL, February 2020.

Zemba, S., Air Emissions/Deposition as a Potential Pathway to Groundwater Contamination. PFAS and Related Compounds Workshop, American Groundwater Trust, Tallahassee, FL, January 8, 2020.

Roakes, H. and Zemba, S., "PFAS Cycling Between Landfills and Wastewater Treatment Plants," presented at the Solid Waste Association of North America - Southern New England Chapter membership meeting, Raynham, MA, December 18, 2019.

Abell R., Kray J., Thurlow, M., Zemba, S., "PFAS Contamination: Evolving State and Federal Regulatory Landscape, Science, Litigation, and Due Diligence in Transactions," Strafford Webinar, October 31, 2019.

Badireddy A., Zhu W., Roakes H., Zemba S., "PFAS Background in Vermont Shallow Soils," The 35th Annual International Conference on Soils, Sediments, Water, and Energy, Amherst, MA, October 23, 2019.

Zemba S., Roakes H., "PFAS Cycling Between Landfills and Wastewater Treatment Plants," The 35th Annual International Conference on Soils, Sediments, Water, and Energy, Amherst, MA, October 23, 2019.

Roakes H., Zemba S., and Beecher N., "PFAS Leachability from Soils: Principles, Regulatory Review, and Considerations for Site Investigations," The 35th Annual International Conference on Soils, Sediments, Water, and Energy, Amherst, MA, October 23, 2019.

Corenthal L., Roakes H., Sheehan A., and Zemba S., "Light Non-Aqueous Phase Liquid (LNAPL) Site Closure Using Non-Traditional Field Data and Analysis," (Poster Presentation) The 35th Annual International Conference on Soils, Sediments, Water, and Energy, Amherst, MA, October 22, 2019.

Zemba, S., PFAS – Here, There, and Everywhere. Presentation at the ACEC of Vermont 4th Annual Environmental Protection Technical Workshop, Burlington, Vermont, October 17, 2019.

Zemba, S., PFAS Cycling Between Landfills and WWTPs. Presentation at the Colorado SWANA 2019 Annual Conference, Rocky Mountain Chapter, Colorado Springs, Colorado, October 1-2, 2019.

Zemba, S. (2019). Air Emissions/Deposition as a Potential Pathway to Groundwater Contamination. New England PFAS Workshop, American Groundwater Trust, Westford, MA, September 18, 2019

Zemba, S. and Steinhauser, E. (2019). PFAS and Landfills: Science, Policy and Risk Management. Presentation at the 21st Annual Joint Fall Conference, SWANA Keystone Chapter & PA Waste Industries Association, Harrisburg, Pennsylvania, September 4-5, 2019.

Zemba, S. (2019). PFAS Cycling Between Landfills and WWTPs. Presentation at the EREF Summit on PFAS in Leachate, Ypsilanti, Michigan, August 14-15, 2019.

Zemba, S. (2019). Air Emissions/Deposition as a Potential Pathway to Groundwater Contamination. PFAS and Other Emerging Contaminants, American Groundwater Trust, Albuquerque, NM, July 24, 2019

Abell, R., Thurlow, M., and Zemba, S. (2019). PFAS: State Regulation, Litigation, Recent. Strafford webinar, July 16, 2019.

Mittleman, A., and Zemba, S. (2019). Atmospheric Deposition as a Source of Contamination at PFAS-Impacted Sites. Transportation Research Board, Sustainable Resource Conservation & Recovery in Transportation, Washington, DC, July 15, 2019.

Roakes, H. and Zemba, S. (2019). PFOA Fate and Transport: Considering Soil as a Potential Reservoir for PFOA in the Environment. Presentation at the Air & Waste Management Association's 112th Annual Conference & Exhibition, Québec City, Québec; June 25-28, 2019, Abstract #601867

Roakes, H. and Zemba, S. (2019). PFOA Fate and Transport: Considering Soil as a Potential Reservoir for PFOA in the Environment. Presentation at the Air & Waste Management Association's 112th Annual Conference & Exhibition, Québec City, Québec; June 25-28, 2019, Abstract #601867.

Damiano L. and Zemba, S. (2019). Comparison of Greenhouse Gas Emissions: Waste-to-Energy vs. Landfilling. Presentation at the Air & Waste Management Association's 112th Annual Conference & Exhibition, Québec City, Québec; June 25-28, 2019, Abstract #602309.

Zemba, S. and Roakes, H. (2019). PFAS Cycling Between Landfills and WWTPs. Presentation at the Air & Waste Management Association's 112th Annual Conference & Exhibition, Québec City, Québec; June 25-28, 2019, Abstract #601793.

Zemba, S (2019). Air Emissions/Deposition as a Potential Pathway to PFAS Soil and Groundwater Contamination. Panel Session Per and Polyfluoroalkyl Substances (PFAS): Specific Technical Challenges, Litigation, and Solutions. Presentation at the Air & Waste Management Association's 112th Annual Conference & Exhibition, Québec City, Québec; June 25-28, 2019, Abstract #601793.

Zemba, S., and Roakes, H. (2019). PFAS Cycling Between Landfills and WWTPs. NY Federation of Solid Waste & Recycling Conference. Bolton Landing, NY, May 19-22, 2019.

Damiano, L. and Zemba, S. (2019). Comparison of Greenhouse Gas Emissions: Waste-to-Energy vs. Landfilling. NY Federation of Solid Waste & Recycling Conference. Bolton Landing, NY, May 19-22, 2019.

Abell, R., Thurlow, M., and Zemba, S. (2019). PFAS: State Regulation, Litigation, Recent. Strafford webinar, May 16, 2019.

Zemba, S. (2019). A Primer on PFAS: A Contaminant Emerged. Presentation to the Ohio Utility Group, Columbus, OH, May 9, 2019.

Zemba, S., and Zevitas, C. (2019). Atmospheric deposition as a source of contamination at PFAS-impacted Sites. ACEC-NC, PFAS and Other Emerging Contaminants Conference, Raleigh, NC, April 23, 2019.

Estabrooks, M., and Zemba, S. (2019), *Siloxanes in the Waste Stream – Environmental and Financial Impacts*. A&WMA EM Magazine, March 2019.

Little, H., and Zemba, S. (2019), *Landfill Gas-to-Energy – Evaluating Level of Risk from Formaldehyde Emissions*. A&WMA EM Magazine, March 2019.

Zemba, S., Abell, R., and Roakes, H. (2019), *Landfills—Be Aware of Emerging Contaminants!*. A&WMA EM Magazine, March 2019.

Zemba, S. (2019). Air Emissions/Deposition as a Potential Pathway to Groundwater Contamination. Perfluorochemicals Groundwater Contamination Conference, American Groundwater Trust, Mount Laurel, NJ, March 6, 2019.

Zemba, S. (2019). Air Emissions/Deposition as a Potential Pathway to Groundwater Contamination. Pittsburgh, PA PFAS Workshop., American Groundwater Trust, Canonsburg, PA, March 4, 2019.

Zemba, S. (2019). A Primer on PFAS: A Contaminant Emerged. Presentation at the 4C HSE Conference, Austin, TX, February 6-8, 2019.

Zemba, S., *et al.* (2018), Health Risk Assessment Perspectives on PCBs in Building Materials and Indoor Air. Environmental Business Council of New England PCB Management Program – Emerging Issues in PCB Management for Buildings and the Environment, Providence, RI, September 6, 2018.

Zemba, S. and Abell, R. (2018). Comments on the June 23, 2018 draft *Toxicological Profile for Perfluoroalkyls*. Submitted to the Agency for Toxic Substances Registry, August 20, 2018. Docket ATSDR-2015-0004.

Abell, R., Kray, J., Thurlow, M., and Zemba, S. (2018). PFAS Contamination: Evolving State and Federal Regulatory Landscape, Litigation, and Due Diligence in Transactions. Strafford webinar, August 7, 2018.

Beecher, N., Zemba, S., and Lee, L. (2018). PFAS, Wastewater, and Biosolids Management. Water Environment Federation webcast, August 1, 2018.

Zemba, S., *et al.* (2018). Air Emissions/Deposition as a Potential Pathway to Groundwater Contamination. Perfluorochemicals Groundwater Contamination Conference, American Groundwater Trust, Grand Rapids, MI, July 26, 2018.

Zemba, S., *et al.* (2018). Health Risk Assessment Perspectives on PCBs in Building Materials and Indoor Air. Environmental Business Council of New England PCB Management Program – Managing PCB Impacted Building Materials, Boston, MA, July 17, 2018.

Zemba, S. (2018). Comments on the June 22-23, 2018 Per- and Polyfluoroalkyl Substances New England Community Engagement meeting, submitted to the U.S. Environmental Protection Agency, July 10, 2018. Docket EPA-OW-2018-0270.

Little, H, Zemba, S, and Damiano, L. (2018). Derivation of Risk-based Emission Limits for Formaldehyde from Landfill Gas-to-Energy Engine Emissions. A&WMA's 111th Annual Conference and Exhibition, Hartford, CT, June 25-28, 2018.

Zemba, S. and Muniz, P. (2018). Case Study of Residential Redevelopment and PCB Encapsulation. A&WMA's 111th Annual Conference and Exhibition, Hartford, CT, June 25-28, 2018.

Zemba, S. and Muniz, P. (2018). Assessing Risks of Using Soils in Landfills as Cover. A&WMA's 111th Annual Conference and Exhibition, Hartford, CT, June 25-28, 2018.

Roakes, H., Zemba, S. and Abell, R. (2018). PFAS and the Solid Waste Industry. A&WMA's 111th Annual Conference and Exhibition, Hartford, CT, June 25-28, 2018.

Estabrooks, M. and Zemba, S. (2018). Siloxanes: Impact on Landfill Gas Engine-Generator Air Emissions. A&WMA's 111th Annual Conference and Exhibition, Hartford, CT, June 25-28, 2018.

Damiano, L. and Zemba, S. (2018). Management of Mildly-Contaminated Soil Outside of Landfills. A&WMA's 111th Annual Conference and Exhibition, Hartford, CT, June 25-28, 2018.

Zemba, S. (2018). A Primer on PFAS: A Contaminant Emerged. 4C HSE Conference, San Antonio, TX, April 3, 2018.

Zemba, S. (2018). Formaldehyde: A New Concern for Air Permitting? 4C HSE Conference, San Antonio, TX, April 3, 2018.

Zemba, S., D. Adams, *Reuse of Contaminated Soils as Alternate Daily Cover at Landfills*. A&WMA EM Magazine, March 2018.

Zemba, S., I. Cooper, M. Thurlow, F.Boodoo, J. Matthis, P. Stanford,, S. Koenigsberg, Emerging Contaminants Found in Landfill Leachate Panel, International Solid Waste Conference, Annapolis (Washington, D.C.), March 12, 2018

Thurlow, M., R. Abell and S. Zemba, *PFAS Contamination Remains a Hot-Button Issue: Overview of Recent Regulatory, Litigation, and Technical Developments*. American Bar Association, Section of Environment, Energy, and Resources, Committee Articles, December 15, 2017.

Zemba, S. (2017). PFAS and Landfills. Norwich University, Northfield, VT, SWANA Northern New England Chapter meeting, October 24, 2017.

Roakes, H., and Zemba, S., "PFAS Fate and Transport – A Heuristic Model for Understanding PFAS in the Environment." presented at the AEHS Foundation East Coast Conference, Amherst, MA, October 18, 2017.

Damiano, L., and Zemba, S. (2017). Environmental Benefits and Impacts of Recovering Energy from Biogas. Southern New England SWANA Fall Breakfast, Amherst, MA, October 16, 2017.

Zemba, S.G. (2017). Air Emissions/Deposition as a Potential Pathway to Groundwater Contamination. Perfluorochemicals Groundwater Contamination Conference, American Ground Water Trust, Cincinnati, OH, September 13, 2017.

Zemba, S.G. (2017). Air Quality Impacts and Health Risks from Hot Mix Asphalt Plant Emissions. National Asphalt Pavement Association, Midyear Meeting, Chicago, IL, July 18, 2017.

Thurlow, M., R. Abell and S. Zemba, *Emergence of PFAS: A Public Health Concern?* Webinar, American Bar Association, July 11, 2017.

Zemba, S.G. (2017). Energy from Waste: Many Types, Many Challenges, Future Strategies. A&WMA's 110th Annual Conference and Exhibition, Pittsburgh, PA, June 5-8, 2017.

Zemba, S.G. and Damiano, L.L. (2017). PFAS Contamination of Groundwater by Airborne Transport and Deposition. A&WMA's 110th Annual Conference and Exhibition, Pittsburgh, PA, June 5-8, 2017.

Zemba, S.G., and Saikaly, R. (2017). Health Risks from Fugitive Petcoke Dust Emissions. A&WMA's 110th Annual Conference and Exhibition, Pittsburgh, PA, June 5-8, 2017.

Roakes, H., and Zemba, S., "The Emergence of PFAS," presented at the Suzanne D. LaLonde Institute session of the Federation of New York Solid Waste Associations Solid Waste/Recycling Conference and Trade Show, Bolton Landing, NY, May 23, 2017.

Damiano, L., and Zemba, S. (2017). What's the Best Way to Manage Landfill Gas? *EM – The Magazine for Environmental Managers*, Air & Waste Management Association, March 2017.

Zemba, S.G. (2016). Background on PFC Composition, Sources, Transport & Fate, and Toxicity. Environmental Business Council of New England, New Hampshire Chapter Program: Update on Management of PFCs, November 18, 2016.

Zemba, S., and Roakes, H. (2016). The Emergence of PFCs. NEWWA - 2016 Water Resources and Sustainability Symposium, Devens, MA, October 27, 2016.

Zemba, S., and Estabrooks, M. (2016). Air Emissions from Landfill-Gas-to-Energy Engines: A Health Risk? A&WMA's 109th Annual Conference and Exhibition, New Orleans, LA, June 20-23, 2016.

Zemba, S.G. (2016). Can Air Pollution Sources Adversely Affect Soil and Vegetation? A&WMA's 109th Annual Conference and Exhibition, New Orleans, LA, June 20-23, 2016.

Zemba, S., and Damiano, L. (2016). Air Emissions from Landfill-Gas-to-Energy Engines: A Health Risk? Federation of New York Solid Waste Association Solid Waste & Recycling Conference, May 18, 2016.

Estabrooks, M.E., and Zemba, S.G.(2016). Siloxanes: Impact on LFG Engine-Generator Air Emissions. Webinar sponsored by the Solid Waste Association of North America (SWANA), March 30, 2016.

Zemba, S.G. (2013). Global, Synoptic, and Local Scale Circulation. Guest Lecture at the 1.725 Chemicals in the Environment: Fate and Transport, Massachusetts Institute of Technology, Cambridge, MA, November 12.

Zemba, S.G. and Lester, R. R. (2013). Application of USACE Dredged Material Management Decisions (D2M2) Model to Manage Contaminated Sediments. Podium presentation at the AEHS Annual Conference on Soils, Sediments, Water and Energy, Amherst, MA, October 21-24.

Zemba, S., Green, L., and Peters, N. (2013). Landfill Gas Combustion: Evaluating Health Risks and Neighborhood Concerns. Podium presentations at the Annual Conference, New York Federation of Solid Waste Associations, Bolton Landing, NY, May 5-8 and Solid Waste Association of North America Wastecon Conference, Long Beach, CA, September 17-19.

Zemba, S. and Green, L. (2012). PCBs in the indoor environment. Poster presentation at the Annual Meeting, Society for Risk Analysis, San Francisco, CA, December 9-12.

Zemba, S.G. (2012). Implications of the 1-Hour National Ambient Air Quality Standard for NO2. Podium presentation at the Annual Conference, New York Federation of Solid Waste Associations, Bolton Landing, NY, May 20-23.

Zemba, S.G. (2012). Health Risk Assessment Perspectives on PCBs in Building Materials and Indoor Air. Invited presentation at the meetings *Managing PCB Contaminated Caulking in Older Buildings*, organized by the New England Environmental Business Council, and held at E.L. Harvey & Sons, Westborough, MA, March 2, Northeast Utilities, Berlin, CT, May 1, Adler Pollock & Sheehan, Providence, RI, October 23, and PSNH Energy Park, Manchester, NH, November 28.

Zemba, S.G. (2011). Global, Synoptic, and Local Scale Circulation. Guest Lecture at the *1.725 Chemicals in the Environment: Fate and Transport*, Massachusetts Institute of Technology, Cambridge, MA, November 15.

Zemba, S. (2011). Relative Risk of Radionuclide Releases: Nuclear vs. Coal-Fired Power Pants. Podium presentation at the *SETAC North America 32nd Annual Meeting*, Hynes, Convention Center, Boston, MA, November 13-17.

Zemba, S.G., Ames, M.A., and Sullivan, D.M. (2011). PCBs Exposure via Indoor Air. Poster presentation at the *21st Annual Meeting of The International Society of Exposure Science, Advances Exposure Science for Environmental Health*, Baltimore, MD, October 23-27.

Zemba, S.G. and Lester, R.R. (2011). Vegetable Ingestion Pathway at Contaminated Waste Sites. Podium presentation at *the 21st Annual Meeting of The International Society of Exposure Science, Advances Exposure Science for Environmental Health*, Baltimore, MD, October 23-27.

Zemba, S.G. and Matthews, B. (2011). Multipathway Exposure Assessment of Hazardous Air Pollutants Emissions Workshop. *21st Annual Meeting of The International Society of Exposure Science, Advances Exposure Science for Environmental Health*, Baltimore, MD, October 23-27.

Zemba, S.G. (2011). Relevance of the Vegetable Ingestion Pathway in Contaminated Soil Risk Assessment. Podium presentation at the *27th Annual International Conference on Soils, Sediments, Water and Energy*, University of Massachusetts, Amherst, MA, October 17-20.

Zemba, S., Green, L., Ames, M., Hunt, G., and Sullivan, D. (2011). PCBs in Indoor Environments. Poster presented at *Sustainable Remediation 2011*, Amherst, MA, June 1-3.

von Stackelberg, K., Zemba, S., Lester, R., Yatsalo, B., and Didenko, V. (2011). Use of a Spatial Decision Support System to Integrate GIS, Environmental Models, Decision Analysis Tools, and Stakeholder Preferences. Poster presented at *Sustainable Remediation 2011*, Amherst, MA, June 1-3.

Zemba, S. and Ames, M. (2010). Considering potential health risks in the design of novel solid waste management facilities. Poster presentation, Annual Meeting, Society for Risk Analysis, Salt Lake City, UT, December 5–8.

Zemba, S., Ames, M., Linkov, I., and Palma, J. (2010). Can dioxin sources be differentiated by congener profiles, and does it matter? Poster presentation, Annual Meeting, Society for Risk Analysis, Salt Lake City, UT, December 5–8.

Zemba, S.G., Ames, M.R., and Green, L.C. (2010). Determining whether landfill gas poses risks to health. In: *Proceedings of the WASTECON 2010 conference*, Solid Waste Association of North America, Boston, MA, August 15-18.

Green, L., Zemba, S., and Ames, M. (2010). Waste-to-Energy Facilities: MSW and Woodwaste Health Risk Assessments. Environmental Business Council, Westborough, MA, July 21.

Zemba, S.G. (2010). Air Quality Issues: Beyond the Fenceline. Presentation at the Environmental Breakfast Club meeting hosted by Young Sommer LLC, Albany, NY, March 5.

Zemba, S. (2009). Symposium: Risk Management Application in the Cement Manufacturing Industry. Annual Meeting, Society for Risk Analysis. Baltimore, MD, December 6–9.

Zemba, S., Ames, M, Bennett, E., and Palma, J. (2009). Risk assessment of hazardous air pollutants from cement kilns: case study of a facility with extensive emission data. Annual Meeting, Society for Risk Analysis, Baltimore, MD, December 6–9.

Zemba, S., Ames, M., and Green, L. (2009). What's in landfill gas; why does it smell; is it hazardous to breathe? Annual Meeting, Society for Risk Analysis, Baltimore, MD, December 6–9.

Zemba, S., Crouch, E., and Lester, R. (2009). *Perspectives on Vapor Intrusion*, Brown Bag Seminar Series, Army Corps of Engineers, New England District, Concord, MA, November 6.

Zemba, S. (2009). Invited panelist, Trends and the Relevancy of Risk Assessment Today. Joint Conference: International Thermal Treatment Technologies (IT3) & Hazardous Waste Combustors (HWC), Air & Waste Management Association, Cincinnati, OH, May 18-21.

Ames, M.R. and Zemba, S.G. (2009). Landfill Gas Combustion and a Possible 1-hour NAAQS for SO2. New York Federation of Solid Waste Associations Conference, Bolton Landing, NY, May 3-6.

Zemba, S.G. and Green, L.C. (2009). What's in Landfill Gas? Why Does it Smell? How Do We Model its Impacts? New York Federation of Solid Waste Associations Conference, Bolton Landing, NY, May 3-6.

Zemba, S.G. (2008). Symposium: Vapor Intrusion: Challenges, Risks, and Uncertainties. Annual Meeting, Society for Risk Analysis, Boston, MA, December 7–10.

Zemba, S.G. (2008). Data and decision analysis in the context of vapor intrusion. Annual Meeting, Society for Risk Analysis, Boston, MA, December 7–10.

Zemba, S.G. (2008). Health risk assessment perspectives on waste-to-energy. Paper presented at the 101st Annual Meeting of the Air & Waste Management Association, Portland, OR, June 24-27.

Zemba, S., Ames, M., and Hendrix, S. (2008). Recent Observations on Risk Assessments of Combustor Stack Emissions. Air & Waste Management Association International Thermal Treatment Technologies Specialty Conference, Montreal, Quebec, Canada, May 12-16.

Linkov, I. and Zemba, S. (2008). Nanotechnology & Risk Assessment. New York Federation of Solid Waste Associations Conference, Bolton Landing, NY, May 4-7.

Zemba, S., Linkov, I., Satterstrom, S., Bullister, E., and DiNardi, S. (2007). Health and Environmental Simulation. American Industrial Hygiene Association Conference (AIHce 2007), June 2-7.

Zemba, S.G. (2005). Indoor Air Pathway: Risk Management and Characterization Issues. Meeting of the Massachusetts Licensed Site Professional Association, March 8.

Zemba, S.G. (2004). Context-Based Benchmarks for Indoor Air Evaluation. 20th Annual International Conference on Soils, Sediments, and Water, Amherst, MA, October 18-21.

Zemba, S., Green, L., and Ames, M. (2002). Particulate (Composition) Matters. Air and Waste Management Association, Hazardous Waste Combustors Specialty Conference, St. Louis, MO, April 17-19.

Green, L.C. and Zemba, S.G. (2002). Quantitative health risk assessment: the devil is in the details. Paper presented at the 10th Section Fall Meeting of the American Bar Association, Section of Environment, Energy, and Resources. Portland, Oregon.

Zemba, S.G. and Green, L.C. (1999). Special topics in risk assessment: models and uncertainties. In: A Practical Guide to Understanding, Managing and Reviewing Risk Assessment Reports, D.A. Belluck, and S.L. Benjamin, Chelsea, MI: Lewis Publishers.

Zemba, S.G. (1996). Atmospheric deposition of nitrogen compounds to the Massachusetts Bays. At: *Atmospheric Deposition to the Great Waters* Specialty Conference, Niagara Falls, NY, October 28-30.

Zemba, S.G., Underhill, J.T., and Sorensen, J.A. (1996). Measurements of mercury in precipitation at Nahant, MA. At: *Atmospheric Deposition to the Great Waters* Specialty Conference, Niagara Falls, NY, October 28-30.

Zemba, S.G., Underhill, J.T., and Sorensen, J.A. (1994). Measurements of mercury in precipitation at Nahant, Massachusetts. Poster presented at the ninth annual Boston Harbor/Massachusetts Bay Symposium, March 24–25.

Underhill, J.T., Golomb, D.S., Zemba, S.G., Ryan, D.K., Eby, N., and Wade, T.L. (1994). Atmospheric deposition to Massachusetts Bays. Presented at the ninth annual Boston Harbor/Massachusetts Bay Symposium, March 24–25.

Zemba, S.G., Golomb, D.S., Underhill, J.T., Ryan, D.K., and Eby, G.N. (1993). Assessing the role of atmospheric deposition of nitrogen compounds. Presented at the eighth annual Boston Harbor/Massachusetts Bay Symposium, March 31-April 1.

Ryan, D.K., Eby, G.N., Golomb, D.S., Wade, T.L., and Zemba, S.G. (1993). Atmospheric deposition of contaminants onto Massachusetts and Cape Cod Bays. Poster presented at the eighth annual Boston Harbor/Massachusetts Bay Symposium, March 31-April 1.

Zemba, S.G. (1993). Simulink™ applications to indoor air dispersion modeling. Presented at the Matlab User's Conference, Cambridge, MA, October 18–20.

Green, L.C. and Zemba, S.G. (1993). Incorporating site-specific assumptions in risk-based regulations. Poster presented at Comparative Risk Analysis and Environmental Priority Setting, Keystone, CO, June 6–11.

Luis, S.J. and Zemba, S.G. (1993). Estimating the impact of source depletion on long-term risk assessments. In: Hydrocarbon Contaminated Soils, Volume III. Boca Raton, FL:Lewis Publishers.

Zemba, S.G., Crouch, E.A.C., and Green, L.C. (1993). An integrated approach to meeting risk-based cleanup goals at a lead-contaminated site. At: *86th Annual Meeting of the Air & Waste Management Association*, Denver, CO, June 13–18.

Zemba, S.G. and Pilkington, M.B.G. (1992). Estimating risks pose by contaminated soils: A comparison to two exposures routes. In: Hydrocarbon Contaminated Soils, Volume II. Boca Raton, FL:Lewis Publishers.

Zemba, S.G., Crouch, E.A., and Pilkington, M.B.G. (1992). The effect of "hot spots" in determining exposure concentrations in soils. Presented at the Symposium on Superfund Risk Assessment in Soil Contamination Studies Conference, New Orleans, LA, 26-31, January.

Zemba, S.G., Golomb, D.S., Dacey, J.W., and Michaels, A.F. (1992). Implications of deep sea disposal of CO2. Presented at the Ocean Sciences Meeting of the American Geophysical Union, New Orleans, LA, 30, January. Abstract:*EOS 72(51)*.

Pilkington, M.B.G. and Zemba, S.G. (1992). Deposition modeling of chlorinated dioxins and furans. Presented at the International Symposium on Measurement of Toxic and Related Air Pollutants, Durham, NC, 3-8 May.

Zemba, S.G., Jaffe, D., Green, L.C., and Robinette, M. (1992). Uncertainty in ecological risk assessment: An alternate interpretation of PCB contamination at a superfund site. Presented at the 85th Annual Meeting of the Air and Waste Management Association, 21-26 June, Paper No. 92-180.29P.

Pilkington, M.B.G., Zemba, S.G., Crouch, E.A.C., and Green, L.C. (1992). A visual tool for assigning site-related soil contaminants at a superfund site. Presented at the 85th Annual Meeting of the Air and Waste Management Association, 21-26 June, Paper No. 92-180.28P.

Jaffe, D.H., Zemba, S.G., Parsons, A.H., and Robinette, M. (1992). Ecological risk assessment of a PCB-contaminated marsh: How should wildlife exposures be estimated? Presented at the SETAC 13th Annual Meeting, 8-12 November, Paper No. 27039.

Zemba, S.G. and Parsons, A.H. (1992). Implications of sediment quality criteria (SQC) as surrogates for ambient water quality criteria (AWQC). Presented at the SETAC 13th Annual Meeting, 8-12 November, Paper No. 27040.

DeVoto, E., Pilkington, M.B.G., Sundstrom, S., and Zemba, S.G. (1991). Exposures to mercury: The importance of waste-to-energy facilities. Presented at the Measurement of Toxic and Related Air Pollutants conference sponsored by the Air and Waste Management Association, Durham, NC, pages 1077-1082.

Crouch, E.A.C., Green, L.C., and Zemba, S.G. (1990). Estimation of health risk from landfill gas emission. Presented at the GRCDA 13th Annual International Landfill Gas Symposium, Lincolnshire, IL, pages 87–94.

Zemba, S.G. and Fay, J.A. (1988). Seasalt contribution to wet cation concentrations in precipitation. Presented at the Fall meeting of the American Geophysical Union, San Francisco, CA, 5 December, Abstract:*EOS 69(44)*.

Fay, J.A. and Zemba, S.G. (1986). A conservative method for estimating gas concentrations in dense gas plumes. Presented at the 79th annual meeting of the Air Pollution Control Association, 22-27 June.

Fay, J.A. and Zemba, S.G. (1984). The lateral extent of a dense gas plume near the source. Presented at the International Conference on Modeling Environmental Flows, American Society of Mechanical Engineers.

Green, L.C., Crouch, E.A.C., and Zemba, S.G. (in press). Cremation, air pollution, and special use permitting: a case study. *Human and Ecological Risk Assessment*.

Golomb, D., Zemba, S. and Arak, L. (2013). Lowering The Carbon Footprint Of A Traditional Fossil-fuel Power Plant Application of AERMOD to Model Air Toxics Impacts from an Intermodal Freight Facility. In: *Proceedings of the Air and Waste Management Association Climate Change Conference*, Herndon, VA, September 10-11.

Zemba, S. and Porter, C. (2013). Application of AERMOD to Model Air Toxics Impacts from an Intermodal Freight Facility. In: *Proceedings of the Air and Waste Management Association Annual Conference and Exhibition*, Chicago, IL, June 25-28.

Porter, C. and Zemba, S. (2013). Improving Health Benefit Estimation of Air Pollutant Emission Reductions for Transportation Projects. In: *Proceedings of the Air and Waste Management Association Annual Conference and Exhibition*, Chicago, IL, June 25-28.

Zemba, S., Green, L., Miller, M., and Crouch, E. (2013). Pink Sky in the Morning, Should There be a Warning? *In: Proceedings of the North American Waste-to-Energy Conference (NAWTEC 21)*, Fort Myers, FL, April 21-15.

Palma-Oliveira, J., Zemba, S.G., Ames, M.R., Green, L.C., and Linkov, I. (2012). Uncertainty in multi-pathway risk assessment for combustion facilities. *Human and Ecological Risk Assessment 18*(3):501-516.

Zemba, S. Ames, M. and Palma-Oliveira, J. (2012). Characterization of Air Toxics Emissions from Extensive Stack Testing of a Portland Cement Manufacturing Facility In: *Proceedings of the Air and Waste Management Association Annual Conference and Exhibition*, San Antonio, TX, June 19-22.

Zemba, S.G. (2012). Do Odors at a Waste Management Facility Indicate a Risk to Health? *In: Proceedings of the North American Waste-to-Energy Conference (NAWTEC 20)*, Portland, ME, April 23-25.

Ames, M., Zemba, S., Green, L., Botelsho, M.J., Gossman, D., Linkov, I., and Palma-Oliveira, J. (2012). Polychlorinated dibenzo(p)dioxin and furan (PCDD/F) congener profiles in cement kiln emissions and impacts. *Science of the Total Environment 419*:37-43.

Zemba, S.G., Ames, M.R., and Green, L.C. (2011). Modeling and measuring impacts from ash landfilling: Using data to inform regulatory policy. *In: Proceedings of the North American Waste-to-Energy Conference (NAWTEC 19)*, Lancaster, PA, May 16-18.

Collier, Z.A., Vogel, J.T., Zemba, S.G., Ferguson, E.A., and Linkov, I. (2011). Management tools for managing vapor intrusion. *Environ Sci Technol 45*(20):8611-12.

Zemba, S., Ames, M., Green, L., Botelho, M., Gossman, D., Linkov, I., and Palma-Oliveira, J. (2011). Emissions of metals and polychlorinated dibenzo(p)dioxins and furans (PCDD/Fs) from Portland cement manufacturing plants: Inter-kiln variability and dependence on fueltypes. *Science of the Total Environment 409*(20):4198-4205.

Zemba, S.G., Binder, J.J., Ames, M.R., and Lester, R.R. (2010). A risk assessment framework for evaluating health risks from new and emerging waste management technologies. *In: Proceedings of the North American Waste-to-Energy Conference (NAWTEC 18)*, Orlando, FL, May 11-13.

Zemba, S., Ames, M., and Green, L. (2009). Waste-to-Energy Combustors: two sets of pollutants; two different stories. In: Proceedings of the Joint Conference: International Thermal Treatment Technologies (IT3) & Hazardous Waste Combustors (HWC), Air & Waste Management Association, Cincinnati, OH, May 18-21.

Ames, M.R. and Zemba, S.G. (2009). Difficulties Demonstrating Compliance With a Possible One–Hour NAAQS For SO2. Joint Conference: International Thermal Treatment Technologies (IT3) & Hazardous Waste Combustors (HWC), Air & Waste Management Association, Cincinnati, OH, May 18-21.

Zemba, S., Ames, M., and Hendrix, S. (2008). Recent Observations on Risk Assessments of Combustor Stack Emissions. Air & Waste Management Association International Thermal Treatment Technologies Specialty Conference, Montreal, Quebec, Canada, May 12-16.

Zemba, S.G. and Ames, M.R. (2006). Risk assessment perspectives on dispersion modeling. EPA/Air & Waste Management Association Guideline on Air Quality Models Conference, Denver, CO, April 26–28.

Zemba S.G., Crouch E.A.C., Sahay S.R., Vanderhoff E., Donovan A. (2005) Background Study of Arsenic Concentrations at a Rhode Island Site. In: Calabrese E.J., Kostecki P.T., Dragun J. (eds) Contaminated Soils, Sediments and Water. Springer, Boston, MA

Zemba, S.G., Crouch, E.A.C., Sahay, S.R., Vanderhoff, E., and Donovan, A. (2003). Background Study of Arsenic Concentrations at a Rhode Island Site. 19th Annual International Conference on Soils, Sediments, and Water, Amherst, MA, October 20-23.

Ames, M.R. and Zemba, S.G. (2003). HWC Risk Assessments: Ruled by Uncertainty. Air & Waste Management Association Specialty Conference on Hazardous Waste Combustors, Charleston, SC, April 1-2.

Zemba, S.G. (2003). Perspectives on Health Risk Assessments under Superfund. American Bar Association, Superfund Hazardous Waste Committee, Newsletter, vol. 4, no. 2.

Zemba, S.G., Ames, M.R., and Green, L.C. (2002). Particulate (composition) matter(s). Air and Waste Management Association, Hazardous Waste Combustion Specialty Conference, St. Louis, MO, April 17-19.

Ames, M.R., Zemba, S.G., Yarnartino, R.J., Valberg, P.A., and Green, L.C. (2002). Comments on "Using CALPUFF to Evaluate the Impacts of Power Plant Emissions in Illinois: Model Sensitivity and Implications." Atmospheric Environment 36:2263-2265.

Zemba, S., Ames, M., Alvarado, M., Gossman, D., Woodford, J., and Chrispell, C. (2001). Evaluating the Consequences of Mercury Emissions from a Point Source. Air & Waste Management Association Specialty Conference on Mercury Emissions: Fate, Effects, and Control, Chicago, IL, August 20-23.

Golomb, D., Ryan, D., Eby, N., Underhill, J., and Zemba, S. (1997). Atmospheric deposition of toxics onto Massachusetts Bay. I. Metals. Atmospheric Environment 31(9):1349-1359.

Golomb, D., Ryan, D., Underhill, J., Wades, T., and Zemba, S. (1997). Atmospheric deposition of toxics onto Massachusetts Bay. II. Metals. Atmospheric Environment 31(9):1361-1368.

Zemba, S.G. (1996). Atmospheric deposition of nitrogen compounds to the Massachusetts Bays. In: Atmospheric Deposition to the Great Waters, VIP-72, Proceedings of an Air & Waste Management Conference, p. 48-62.

Zemba, S.G., Underhill, J.T., and Sorensen, J.A. (1996). Measurements of mercury in precipitation at Nahant, MA. In: Atmospheric Deposition to the Great Waters, VIP-72, Proceedings of an Air & Waste Management Conference, p. 113-123.

Golomb, D., Ryan, D., Underhill, J., Wade, T., and Zemba, S. (1996). Atmospheric deposition of polycyclic aromatic hydrocarbons onto Massachusetts Bay. In: *Atmospheric Deposition to the Great Waters, VIP-72, Proceedings of an Air & Waste Management Conference*, p. 228-237.

Zemba, S.G., Green, L.C., Crouch, E.A.C., and Lester, R.R. (1996). Quantitative risk assessment of stack emissions from municipal waste combustors. *J. of Haz. Materials* 47:229-275.

Zemba, S.G., Crouch, E.A.C., and Green, L.C. (1993). An integrated approach to meeting risk-based cleanup goals at a lead-contaminated site. In: *Proceedings of the 86th Annual Meeting of the Air & Waste Management Association*, Denver, CO, June 13–18.

Zemba, S.G., Golomb, D.S., Ryan, D.K., Eby, G.N., Underhill, J.T., and Wade, T.L. (1993). Annual deposition of pollutants to the Massachusetts Bays. *Eos, April 20 supplement:*79.

Green, L.C., Crouch, E.A.C., Zemba, S.G., and Parsons, A.P. (1992). Estimating exposures to dioxin-like compounds. Letter to Editor. *Municipal Solid Waste News 14(11)*:13-14.

Zemba, S.G. and Green, L.C. (1992). Perspectives on mercury. *Solid Waste and Power 6(3)*:38–44.

Golomb, D.S., Zemba, S.G., Dacey, J.W.H., and Michaels, A.F. (1992). The fate of CO2 sequestered in the deep ocean. *Energy Convers. Mgmt. 33(5-8)*:675-683.

Zemba, S.G., Fay, J.A., and Golomb, D.S. (1991). The nature of time-averaged measurements of ozone concentrations. Presented at the Tropospheric Ozone and the Environment II: Effects, Modeling and Control and the Response of Southern Commercial Forests to Air Pollution.

Herzog, H., Golomb, D., and Zemba, S. (1991). Feasibility, modeling and economics of sequestering power plant CO2 emissions in the deep ocean. *Environmental Progress 10*:64–74.

Crouch, E.A.C., Zemba, S.G., Pilkington, M.B.G., and Menzie, C.A. (1990). Distributions of metals in soils and their implication for risk assessment. The "How Clean is Clean" conference sponsored by the Air and Waste Management Association, Boston, MA, pages 202-220.

Zemba, S.G., Fay, J.A., and Golomb, D.S. (1990). Ground-level ozone in eastern north america: Its formation and transport. *M.I.T. Energy Lab Report* MIT-EL-90-002.

Zemba, S.G. (1989). A seasonally averaged model of boundary layer ozone for eastern North America, Massachusetts Institute of Technology, Ph.D. Thesis.

Fay, J.A., Golomb, D., and Zemba, S.G. (1989). Observed and modeled trend of sulfate and nitrate in precipitation in eastern north america. *Atmospheric Environment 23(8)*: 1863–1866.

Zemba, S.G., Golomb, D., and Fay, J.A. (1988). Wet sulfate and nitrate deposition patterns in eastern north america. *Atmospheric Environment 22(12)*:2751–2761.

Fay, J.A., Golomb, D.S., Galeucia, G., Poole, P., and Zemba, S.G. (1988). Seasonal/episodic control of acid deposition. *M.I.T. Energy Lab Report* MIT-EL-88-0

Fay, J.A., Golomb, D., and Zemba, S.G. (1987). A regional model of annual average airborne NOx. Presented at the APCA Specialty Conference on Ozone, Hartford, CT.

Fay, J.A. and Zemba, S.G. (1987). Modeling the dispersion of initially compact gas clouds. Proceedings of the International Conference on Vapor Cloud Modelling, Cambridge, MA, pages 439–452.

Fay, J.A., Golomb, D., and Zemba, S.G. (1987). Use of source apportionment model for designing acid deposition mitigating strategies in Massachusetts. M.I.T. Energy Lab Report MIT-EL-87-005.

Fay, J.A. and Zemba, S.G. (1986). Integral model of dense gas plume dispersion. *Atmospheric Environment 20(7)*:1347–1354.

Golomb, D. and Zemba, S. (1986). Source apportionment of wet sulfate deposition and airborne sulfur oxides in Cannon County, TN, and Clifton, VA. Energy Laboratory, Massachusetts Institute of Technology.

Zemba, S.G. (1985). Dense gas plume dispersion. Massachusetts Institute of Technology, Master's Thesis.

Fay, J.A. and Zemba, S.G. (1985). Dispersion of initially compact dense gas clouds. *Atmospheric Environment 19(8)*:1257–1261.

PROFESSIONAL COURSE AND WORKSHOP INSTRUCTION

Multi-Pathway Exposure Assessment, Full-day workshop co-taught at the International Society of Exposure Science Annual Meeting, Baltimore, MD, October 23, 2011.

Multi-Pathway Risk Assessment, Half-day workshop taught at the Society for Risk Analysis Meeting, Salt Lake City, UT, December 5, 2010.

MCP Risk Management, Full-day workshop (co-taught) sponsored by the MA Licensed Site Professional Association, given each of October 13, 2009, March 15, 2010, and February 16, 2012.

MCP ShortForm Short Course, Half-day-day workshop (co-taught) sponsored by the MA Licensed Site Professional Association, given each of May 7, 2008, November 4, 2008, December 17, 2009, September 8, 2011, and May 21, 2013.

Method 3 Risk Characterization, Full-day workshop (co-taught) sponsored by the MA Licensed Site Professional Association, given each of December 15, 2004 and April 6, 2006.

Refined Modeling Report

Connell Resources
Wellington, CO

Antea®Group

Understanding today.
Improving tomorrow.

PREPARED FOR
Connell Resources
7785 Highland Meadows Parkway
#100
Fort Collins, CO 80528

PREPARED BY
Antea Group Charlotte, NC

May 18, 2023

Project # 2023-01-504091

us.anteagroup.com

The logo and ANTEA are registration trademarks of Antea USA, Inc.

Contents

1.0 Introduction 1

1.1 Executive Summary 1

1.2 Plant Description 1

2.0 Modeling Preparation 1

2.1 Air Dispersion Modeling Options 1

2.2 Source Information 1

2.3 Building Information 1

2.4 Receptor Information 2

2.5 Terrain 2

2.6 Meteorological Data 2

3.0 AERMOD Results 2

4.0 Remarks 3

Tables

Table 1: Emission Source Information
Table 2: Building Information
Table 3: Summary of AerMod Calculated Emissions and NAAQS
Table 4: Summary of Screening Analysis for AerMod Calculated HAP Emissions
Table 5: AerMod Calculated HAP Emissions and Discrete Receptors - Acute Values
Table 6: AerMod Calculated HAP Emissions and Discrete Receptors - Chronic Values

Figures

Figure 1 – Site Location Map
Figure 2 - Site General Map
Figure 3 - Site Batch Plant Map
Figure 4 - PM 10 Map (24-Hour)
Figure 5A - PM 2.5 Map (24-Hour)
Figure 5B - PM 2.5 Map (1-Year)
Figure 6A - NOx Map (1- Hour)
Figure 6B - NOx Map (1-Year)
Figure 7 - SO_2 Map (1- Hour)
Figure 8A - CO Map (1-Hour)
Figure 8B - CO Map (8-Hour)
Figure 9A - Acetaldehyde Map (Long-Term)
Figure 9B - Acetaldehyde Map (Short-Term)
Figure 10A - Hexane Map (Long-Term)
Figure 10B - Hexane Map (Short-Term)
Figure 11A - Formaldehyde Map (Long-Term)
Figure 11B - Formaldehyde Map (Short-Term)

Figure 12A - Toluene Map (Long-Term)
Figure 12B - Toluene Map (Short-Term)
Figure 13A - Quinone Map (Long-Term)
Figure 13B - Quinone Map (Short-Term)
Figure 14A - Benzene Map (Long-Term)
Figure 14B - Benzene Map (Short-Term)
Figure 15A - Ethylbenzene Map (Long-Term)
Figure 15B - Ethylbenzene Map (Short-Term)
Figure 16A - Xylene Map (Long-Term)
Figure 16B - Xylene Map (Short-Term)
Figure 17A - Total PAH Map (Long-Term)
Figure 17B - Total PAH Map (Short-Term)
Figure 18A - HCl Map (Long-Term)
Figure 18B - HCl Map (Short-Term)

Appendices

Appendix A - Emission Calculations and Supporting Documentation
Appendix B - AerMod Model Output

Refined Modeling Report

Wellington, Colorado

1.0 INTRODUCTION

1.1 EXECUTIVE SUMMARY

Antea Group was retained to complete refined air modeling for Connell Resources to assist with their planned construction of a new asphalt facility in Wellington, Colorado. Antea Group completed AERMOD modeling based on information provided by Connell Resources for their proposed facility. Antea Group modeled the following pollutants as requested by Connell Resources: Particulate Matter, Nitrogen Oxide, Sulfur Dioxide, Carbon Monoxide, Acetaldehyde, Hexane, Formaldehyde, Toluene, Quinone, Benzene, Ethylbenzene, Xylene, Total PAH, and Hydrochloric Acid.

1.2 PLANT DESCRIPTION

The facility site is located at 40°43'32.63" N and 105°00'33.98" W along E County Rd 66 in Wellington, Colorado. **Figure 1** denotes the site location. **Figures 2 and 3** show the site property with the emission points and building locations.

2.0 MODELING PREPARATION

Building location, and emission point details are provided in **Figure 2**. Emission point details (i.e. emission rate, distance to property line, stack height, flow rate, etc.) were provided by Connell Resources.

2.1 AIR DISPERSION MODELING OPTIONS

As required by AERMOD, all coordinates were entered into the model as Universal Transverse Mercator (UTM) North American Datum (NAD) 83.

2.2 SOURCE INFORMATION

There is one point source emission stack at Connell Resources. **Table 1** shows the location in UTM Coordinates, emission rates, and release parameters.

2.3 BUILDING INFORMATION

A good engineering practice (GEP) stack height/building wake effect analysis was conducted to identify which proposed building structures would influence plume dispersion from each emission source. Based on the formula GEP stack height and region of influence, the BPIP-Prime program was run for the proposed stacks, cullet storage areas, and related building structures. **Figure 2** shows the facility layout, building structures, stack locations, and tank locations. The BPIP-Prime (version 04274) program was used to calculate the GEP height and wind direction specific building dimensions for input to the AERMOD model.

The GEP analysis is used to identify critical buildings and to determine wind direction specific building dimensions for use in the modeling analysis. GEP is also used to demonstrate compliance with all state and federal stack height regulations. Following the EPA's "Guideline for Determination of Good Engineering Practice Stack Height", GEP height is calculated using the following equation:

$H_g = H + 1.5\ L$

where:

H_g = good engineering practice stack height
H = height of the structure or nearby structure
L = lesser dimension (height or projected width of the structure or nearby building)

In a situation where a nearby structure consists of multiple tiers, or there are several structures nearby, the GEP height is calculated for each tier or structure, and the one resulting in the greatest calculated GEP height determines both the GEP height and the wind direction specific building dimension to be used when modeling a stack that is lower than the GEP height.

If the height of the tallest tier or structure is less than the projected width, the height will be the determining factor of this tier and will determine the GEP height. If the height is greater than the projected width, the tallest tier may determine the GEP height.

The current site layout, including building parameters and storage tank locations, was provided by Connell Resources and was incorporated into the model. **Table 2** includes the building parameters.

2.4 RECEPTOR INFORMATION

A single Cartesian receptor grid was generated for use in the AERMOD refined modeling. Tight receptors, spaced 10 meters apart, are placed along the fence line. Receptors are placed 50 meters from the fence line to 1,000 meters from the fence line. Fine receptors, spaced 100 meters apart, are placed from 1,000 meters to 2,000 kilometers of the subject property. In addition, three discrete receptors were placed at nearby properties. Receptor elevations default to surface elevation following input of the local terrain details processed through AERMAP (see Section 2.5 for Terrain details).

2.5 TERRAIN

AERMOD does not distinguish between simple and complex terrain. The National Elevation Dataset provided by Multi-Resolution Land Characteristics Consortium (MRLC), indicated that the terrain was relatively flat. To ensure that the terrain was accurately captured, a terrain pre-processor (AERMAP) was utilized to calculate receptor elevations and hilltop heights.

2.6 METEOROLOGICAL DATA

Colorado Department of Public Health and Environment (CPDHE) provided Regional Meteorological Data for the Wellington, CO area. Per a conversation with Devondria Reynolds of CPDHE, the division has not made a determination that the surface meteorology data processed with any upper air is adequately representative of dispersion conditions at the site. Therefore, if the modeling report were to be submitted to the State of Colorado for air permitting purposes, the meteorological data and modeling protocol would need to be submitted to CPDHE for approval per their Modeling Procedure, before the model is repeated for air permitting.

3.0 AERMOD RESULTS

The AERMOD modeling run demonstrated that the Screening Levels would not be exceeded for chronic long-term and acute short-term. A summary of modeled emissions and NAAQS is presented in **Table 3**. A summary of screening modeled emissions and chronic/acute screening values is presented in **Table 4**. Discrete receptor HAP concentrations for acute and chronic screening values are presented in **Table 5** and **Table 6**, respectively. Pollutant concentration contour maps are provided for general NAAQS pollutant time durations, and HAP Long-Term and Short-Term averaging exposure periods. Concentration contours were drawn at the

receptor elevations provided through the Terrain map processing. The contour maps are present in **Figures 4 through Figure 18**.

4.0 REMARKS

The recommendations contained in this report represent Antea USA, Inc.'s professional opinions based upon the currently available information and are arrived at in accordance with currently accepted professional standards. This report is based upon a specific scope of work requested by the client. The contract between Antea USA, Inc. and its client outlines the scope of work, and only those tasks specifically authorized by that contract or outlined in this report were performed. This report is intended only for the use of Antea USA, Inc.'s client and anyone else specifically identified in writing by Antea USA, Inc. as a user of this report. Antea USA, Inc. will not and cannot be liable for unauthorized reliance by any other third party. Other than as contained in this paragraph, Antea USA, Inc. makes no express or implied warranty as to the contents of this report.

Kara J. Van Blarcum — May 18, 2023
Senior Professional

Reviewed by:

Tony Rossano — May 18, 2023
Senior Project Manager

Tables

Table 1: Emission Source Information
Table 2: Building Information
Table 3: Summary of AerMod Calculated Emissions and NAAQS
Table 4: Summary of Screening Analysis for AerMod Calculated HAP Emissions
Table 5: AerMod Calculated HAP Emissions and Discrete Receptors - Acute Values
Table 6: AerMod Calculated HAP Emissions and Discrete Receptors - Chronic Values

Connell Resources
Wellington, CO
Table 1: Emission Source Information

Emission Point ID	Description	Location	Elevation (ft)	Height (ft)	Termination Orientation	Temperature (F)	Equivalent Exit Diameter (ft)	Flow Rate (cfm)	Easting (m)	Northing (m)
AIRS_ID_001	Main Emission Point	Wellington	5258	45	Vertical	218.93	6.00	85,000	499457.266	4508236.216

Pollutant	Emission Rate (ton/yr)
PM	2.7
PM10	0.7
PM2_5	0.2
NOX	8.3
SO2	8.7
CO	19.5
Acetaldehyde	0.195
Hexane	0.138
Formaldehyde	0.103
Toluene	0.465
Quinone	0.0405
Benzene	0.042
Ethylbenzene	0.33
Xylene	0.405
Total_PAH	0.0345
HCl	0.0315
VOC	4.8

Connell Resources
Wellington, CO
Table 2: Building Information

Building ID	Elevation (ft)	Tier Height (ft)	Easting (m)	Northing (m)
Asphalt	5258	14	499428.373	4508275.569
PCR_1	5259	16	499440.772	4508287.410
PCR_2	5260	12	499458.147	4508287.922
ABP_3	5257	20.5	499428.192	4508254.557
ABP_5	5258	26.4	499448.104	4508243.280
Office	5255	14	499260.168	4508275.882
TW_1	5254	10	499235.319	4508220.844
TW_2	5253	10	499230.147	4508184.114
FP	5254	10	499247.353	4508221.502
FS	5254	10	499262.192	4508221.708
WS	5250	10	499230.641	4508027.037
WG	5250	10	499253.366	4508027.502
ALB	5255	17.7	499378.442	4508201.725
Storshed	5258	10	499411.400	4508290.734
QCLab	5258	14	499423.707	4508282.246
WT1	5257	9.8	499397.849	4508256.301
WT2	5256	9.8	499386.231	4508253.964
D1	5254	9	499259.783	4508194.664
D2	5254	9	499269.843	4508203.302
D3	5254	9	499281.862	4508203.510
D4	5260	8.5	499480.488	4508282.821
Gas_AST	5254	9	499294.275	4508204.457
GEN	5260	9.5	499467.318	4508284.895
ACT	5258	10.2	499459.383	4508244.054

Vertical Storage Tanks

Tank Name	Elevation (ft)	Easting (m)	Northing (m)	Height (ft)	Diameter (ft)
T1	5258	499422.699	4508265.557	44.4	12
T2	5258	499434.251	4508265.622	44.4	12
T3	5259	499446.062	4508265.365	44.4	12

Connell Resources
Wellington, CO
Table 3: Summary of AerMod Calculated Emissions and NAAQS

Pollutant	Averaging Period	AerMod Concentration for Wellington Location ($\mu g/m^3$)	NAAQS Primary Concentration[1] ($\mu g/m^3$)	AerMod Wellington Percent of NAAQS
PM-10	24-hour	0.15	150	0.1%
PM-2.5	24-hour	0.042	35	0.1%
	1-year	0.0025	12	0.02%
NOx	1-hour	7.1	188 ab	4%
	1-year	0.10	100 ab	0.1%
SO2	1-hour	7.5	196 a	4%
CO	1-hour	17	40,000 a	0.0%
	8-hour	10	10,000 a	0.1%

Notes
$\mu g/m^3$ = micrograms per cubic meter
1 = National Ambient Air Quality Standards (NAAQS) for public health protection, including the health of sensitive populations
a = Conversion of units from ppm provided by NAAQS to $\mu g/m^3$ provided by California Air Resource Board
b = Standard provided for NO_2

Connell Resources
Wellington, CO
Table 4: Summary of Screening Analysis for AerMod Calculated HAP Emissions

Pollutant (CAS Number)	Emission Rate (ton/yr)	AerMod Long-Term[1] Average Concentration; ($\mu g/m^3$)	AerMod Short-Term[2] Average Concentration; ($\mu g/m^3$)	Chronic Screening Value[3] ($\mu g/m^3$)	Acute Screening Value[4] ($\mu g/m^3$)	AerMod Long-Term Percent of Acute NAAQS[5] (%)	AerMod Short-Term Percent of Acute NAAQS[5] (%)	Maximum Concentration is Greater than Chronic Screening Value (Yes/No)	Maximum Concentration is Greater than Acute Screening Value (Yes/No)
Acetaldehyde (75-07-0)	0.195	0.0024	0.17	0.45	470 a	5.4E-01	3.6E-02	No	No
Hexane (110-54-3)	0.143	0.0017	0.12	70	390,000 b	2.5E-03	3.0E-05	No	No
Formaldehyde (50-00-0)	0.103	0.0013	0.088	0.077	55 a	1.7E+00	1.6E-01	No	No
Toluene (108-88-3)	0.435	0.0058	0.40	40	37,000 a	1.5E-02	1.1E-03	No	No
Quinone (106-51-4)	0.0405	0.00051	0.035	--	10,000 b	--	3.5E-04	--	No
Benzene (71-43-2)	0.0420	0.00052	0.036	0.13	1,300 a	4.0E-01	2.8E-03	No	No
Ethylbenzene (100-41-4)	0.330	0.0041	0.28	0.40	140,000 c	1.0E+00	2.0E-04	No	No
Xylene (1330-20-7)	0.405	0.0051	0.35	10	8,700 d	5.1E-02	4.0E-03	No	No
Total PAH[6]	0.0345	0.00043	0.030	0.11 e	0.75 f	3.9E-01	4.0E+00	No	No
HCl (7647-01-0)	0.0315	0.00039	0.027	2	--	2.0E-02	--	No	--

Notes
ton/yr = ton per year
$\mu g/m^3$ = micrograms per cubic meter
-- = No value provided
1 = Averaging period of 1-year
2 = Averaging period of 1-hour
3 = Chronic screening values provided by EPA's Appendix A of the Preliminary Risk-Based Screening Approach for Air Toxics Moniotring Data Sets
4 = Acute screening values provided by EPA's Appendix B of the Preliminary Risk-Based Screening Approach for Air Toxics Moniotring Data Sets
5 = Percent calculated as (AerMod Concentration) / (NAAQS Screening Value) * 100
6 = All relavent PAHs accounted for to calculate emission rate
a = Reference Exposure Level (REL) screening value developed by CalEPA
b = Immediately Dangerous to Life or Health divided by 10 (IDLH/10) screening value developed by NIOSH
c = Acute Exposure Guideline Levels (AEGL) screening value developed by NAC
d = Minimum Risk Levels (MRL) screening value developed by ATSDR
e = Average screening value for all PAHs provided in EPA's Appendix A of the Preliminary Risk-Based Screening Approach for Air Toxics Moniotring Data Sets
f = Temporary Emergency Exposure Limits with no effects (TEEL-0) screening value provided by DOE for the PAH Carbazole. The Carbazole screening value is used, because the average PAH chronic screening value most closely matched the chronic Carbazole screening value.

Connell Resources
Wellington, CO
Table 5: AerMod Calculated HAP Emissions and Discrete Receptors - Acute Values

Pollutant (CAS No.)	Emission Rate (ton/yr)	Acute Screening Value ($\mu g/m^3$)	Calculated 1-Hour Average HAP Exposure (µg/m3)					
			Receptor 1: Residential[1]	Receptor 1 Above Screening Value (Yes/No)	Receptor 2: Park[2]	Receptor 2 Above Screening Value (Yes/No)	Receptor 3: School[3]	Receptor 3 Above Screening Value (Yes/No)
Acetaldehyde (75-07-0)	0.195	470 a	0.17	No	0.241	No	0.030	No
Hexane (110-54-3)	0.143	390,000 b	0.12	No	0.017	No	0.021	No
Formaldehyde (50-00-0)	0.103	55 a	0.09	No	0.013	No	0.016	No
Toluene (108-88-3)	0.435	37,000 a	0.40	No	0.057	No	0.072	No
Quinone (106-51-4)	0.0405	10,000 b	0.035	No	0.0050	No	0.0063	No
Benzene (71-43-2)	0.0420	1,300 a	0.036	No	0.0052	No	0.0065	No
Ethylbenzene (100-41-4)	0.330	140,000 c	0.28	No	0.041	No	0.051	No
Xylene (1330-20-7)	0.405	8,700 d	0.35	No	0.050	No	0.063	No
Total PAH	0.0345	0.75 e	0.030	No	0.0043	No	0.0054	No
HCl (7647-01-0)	0.0315	--	0.027	--	0.0039	--	0.0049	--

Notes
ton/yr = ton per year
$\mu g/m^3$ = micrograms per cubic meter
-- = No value provided
1 = Address is 9581 Brome Ct, Wellington, CO 80549
2 = Address is 8760 Buffalo Creek Pky Wellington, CO 80549
3 = Address is 4000 Wilson Avenue Wellington, CO 80549
a = Reference Exposure Level (REL) screening value developed by CalEPA
b = Immediately Dangerous to Life or Health (IDLH) divided by 10 screening value developed by NIOSH
c = Acute Exposure Guideline Levels (AEGL) screening value developed by NAC
d = Minimum Risk Levels (MRL) screening value developed by ATSDR
e = Temporary Emergency Exposure Limits with no effects (TEEL-0) screening value provided by DOE for the PAH Carbazole. The Carbazole screening value is used, because the average PAH chronic screening value most closely matched the chronic Carbazole screening value.

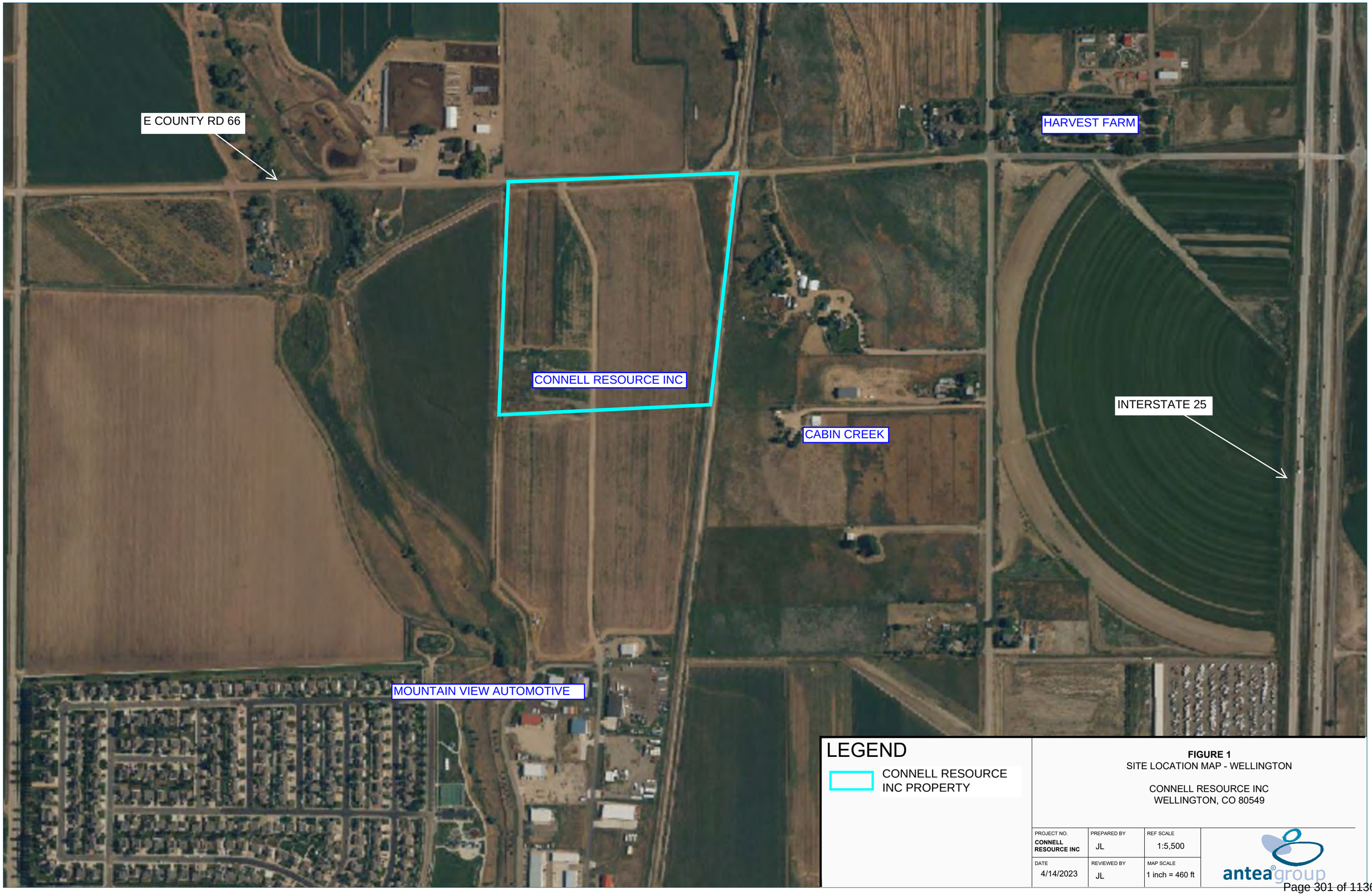
Connell Resources
Wellington, CO
Table 6: AerMod Calculated HAP Emissions and Discrete Receptors - Chronic Values

Pollutant (CAS No.)	Emission Rate (ton/yr)	Chronic Screening Value ($\mu g/m^3$)	Calculated Annual Average HAP Exposure (µg/m3)					
			Receptor 1: Residential[1]	Receptor 1 Above Screening Value (Yes/No)	Receptor 2: Park[2]	Receptor 2 Above Screening Value (Yes/No)	Receptor 3: School[3]	Receptor 3 Above Screening Value (Yes/No)
Acetaldehyde (75-07-0)	0.195	0.45	0.0024	No	0.00026	No	0.00022	No
Hexane (110-54-3)	0.143	70	0.0017	No	0.00019	No	0.00016	No
Formaldehyde (50-00-0)	0.103	0.077	0.0013	No	0.00014	No	0.00012	No
Toluene (108-88-3)	0.435	40	0.0056	No	0.00062	No	0.00053	No
Quinone (106-51-4)	0.0405	--	0.00049	--	0.000050	--	0.000050	--
Benzene (71-43-2)	0.0420	0.13	0.00051	No	0.000060	No	0.000050	No
Ethylbenzene (100-41-4)	0.330	0.40	0.0040	No	0.00044	No	0.00038	No
Xylene (1330-20-7)	0.405	10	0.0049	No	0.00054	No	0.00047	No
Total PAH	0.0345	0.11 a	0.00042	No	0.000050	No	0.000040	No
HCl (7647-01-0)	0.0315	2	0.00038	No	0.000040	No	0.000040	No

Notes
ton/yr = ton per year
$\mu g/m^3$ = micrograms per cubic meter
-- = No value provided
1 = Address is 9581 Brome Ct, Wellington, CO 80549
2 = Address is 8760 Buffalo Creek Pky Wellington, CO 80549
3 = Address is 4000 Wilson Avenue Wellington, CO 80549
a = Average screening value for all PAHs provided in EPA's Appendix A of the Preliminary Risk-Based Screening Approach for Air Toxics Moniotring Data Sets

Figures

Figure 1 - Site Location Map
Figure 2 - Site General Map
Figure 3 - Site Batch Plant Map
Figure 4 - PM 10 Map (24-Hour)
Figure 5A - PM 2.5 Map (24-Hour)
Figure 5B - PM 2.5 Map (1-Year)
Figure 6A - NOx Map (1- Hour)
Figure 6B - NOx Map (1-Year)
Figure 7 - SO_2 Map (1- Hour)
Figure 8A - CO Map (1-Hour)
Figure 8B - CO Map (8-Hour)
Figure 9A - Acetaldehyde Map (Long-Term)
Figure 9B - Acetaldehyde Map (Short-Term)
Figure 10A - Hexane Map (Long-Term)
Figure 10B - Hexane Map (Short-Term)
Figure 11A - Formaldehyde Map (Long-Term)
Figure 11B - Formaldehyde Map (Short-Term)
Figure 12A - Toluene Map (Long-Term)
Figure 12B - Toluene Map (Short-Term)
Figure 13A - Quinone Map (Long-Term)
Figure 13B - Quinone Map (Short-Term)
Figure 14A - Benzene Map (Long-Term)
Figure 14B - Benzene Map (Short-Term)
Figure 15A - Ethylbenzene Map (Long-Term)
Figure 15B - Ethylbenzene Map (Short-Term)
Figure 16A - Xylene Map (Long-Term)
Figure 16B - Xylene Map (Short-Term)
Figure 17A - Total PAH Map (Long-Term)
Figure 17B - Total PAH Map (Short-Term)
Figure 18A - HCl Map (Long-Term)
Figure 18B - HCl Map (Short-Term)



LEGEND

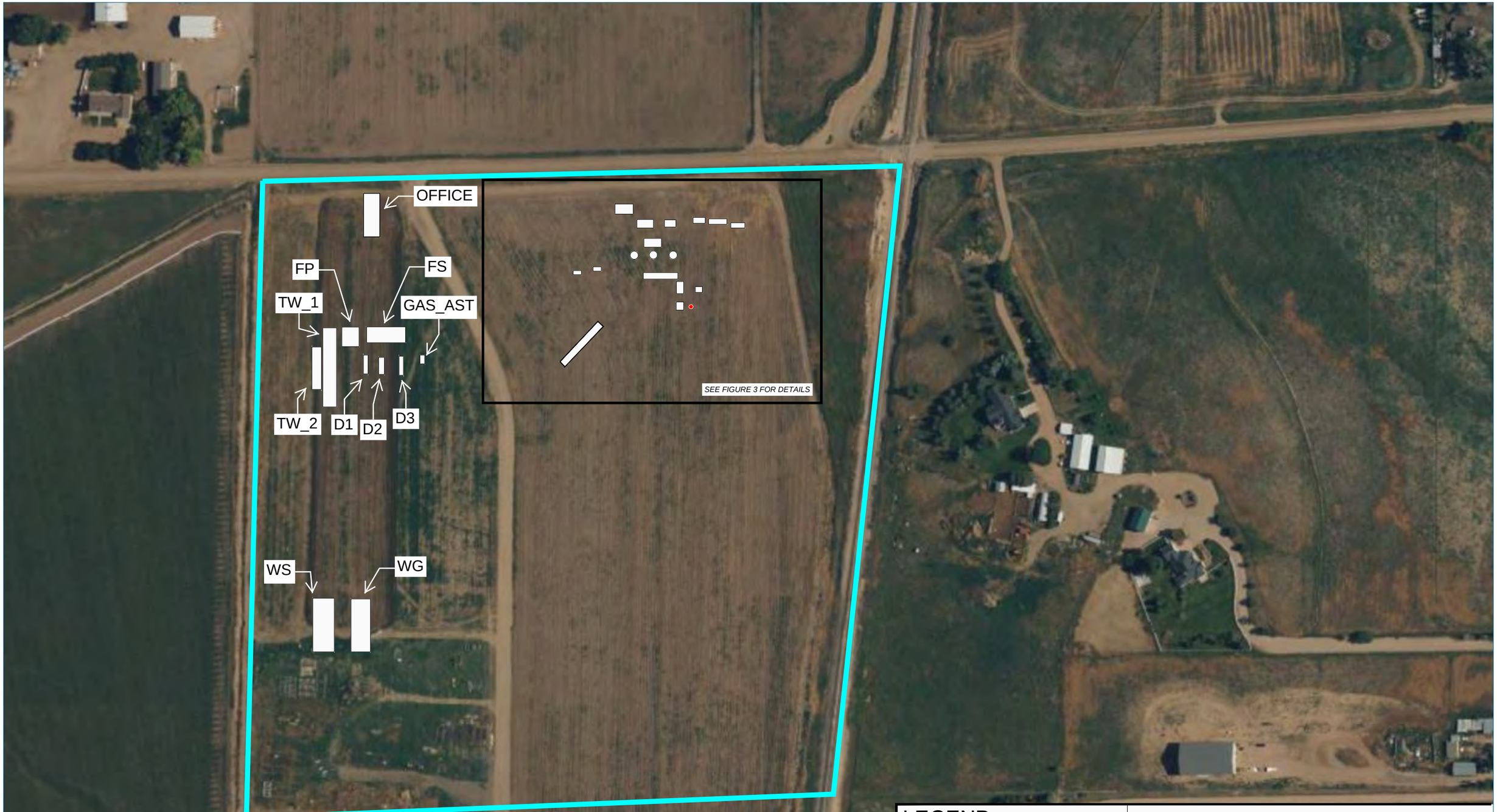
CONNELL RESOURCE INC PROPERTY

FIGURE 1
SITE LOCATION MAP - WELLINGTON

CONNELL RESOURCE INC
WELLINGTON, CO 80549

PROJECT NO.	PREPARED BY	REF SCALE
CONNELL RESOURCE INC	JL	1:5,500
DATE	REVIEWED BY	MAP SCALE
4/14/2023	JL	1 inch = 460 ft

antea group



LEGEND

BUILDING OUTLINE

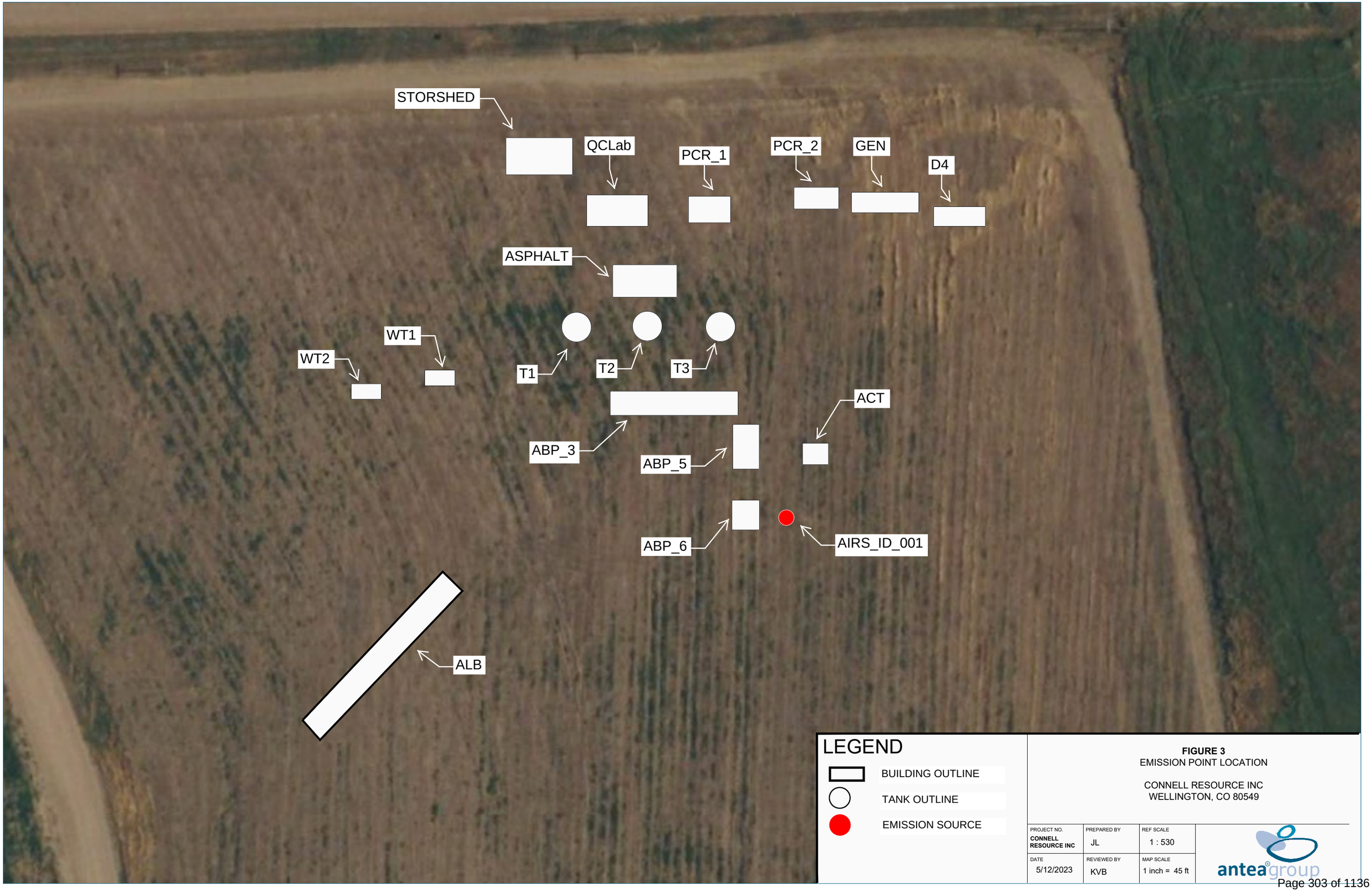
CONNELL RESOURCE INC PROPERTY

FIGURE 2
SITE GENERAL MAP

CONNELL RESOURCE INC
WELLINGTON, CO 80549

PROJECT NO.	PREPARED BY	REF SCALE
CONNELL RESOURCE INC	JL	1 : 2,200
DATE	REVIEWED BY	MAP SCALE
5/12/2023	KVB	1 inch = 185 ft

antea group



LEGEND

- BUILDING OUTLINE
- TANK OUTLINE
- EMISSION SOURCE

FIGURE 3
EMISSION POINT LOCATION

CONNELL RESOURCE INC
WELLINGTON, CO 80549

PROJECT NO.	PREPARED BY	REF SCALE
CONNELL RESOURCE INC	JL	1 : 530
DATE	**REVIEWED BY**	**MAP SCALE**
5/12/2023	KVB	1 inch = 45 ft

antea group

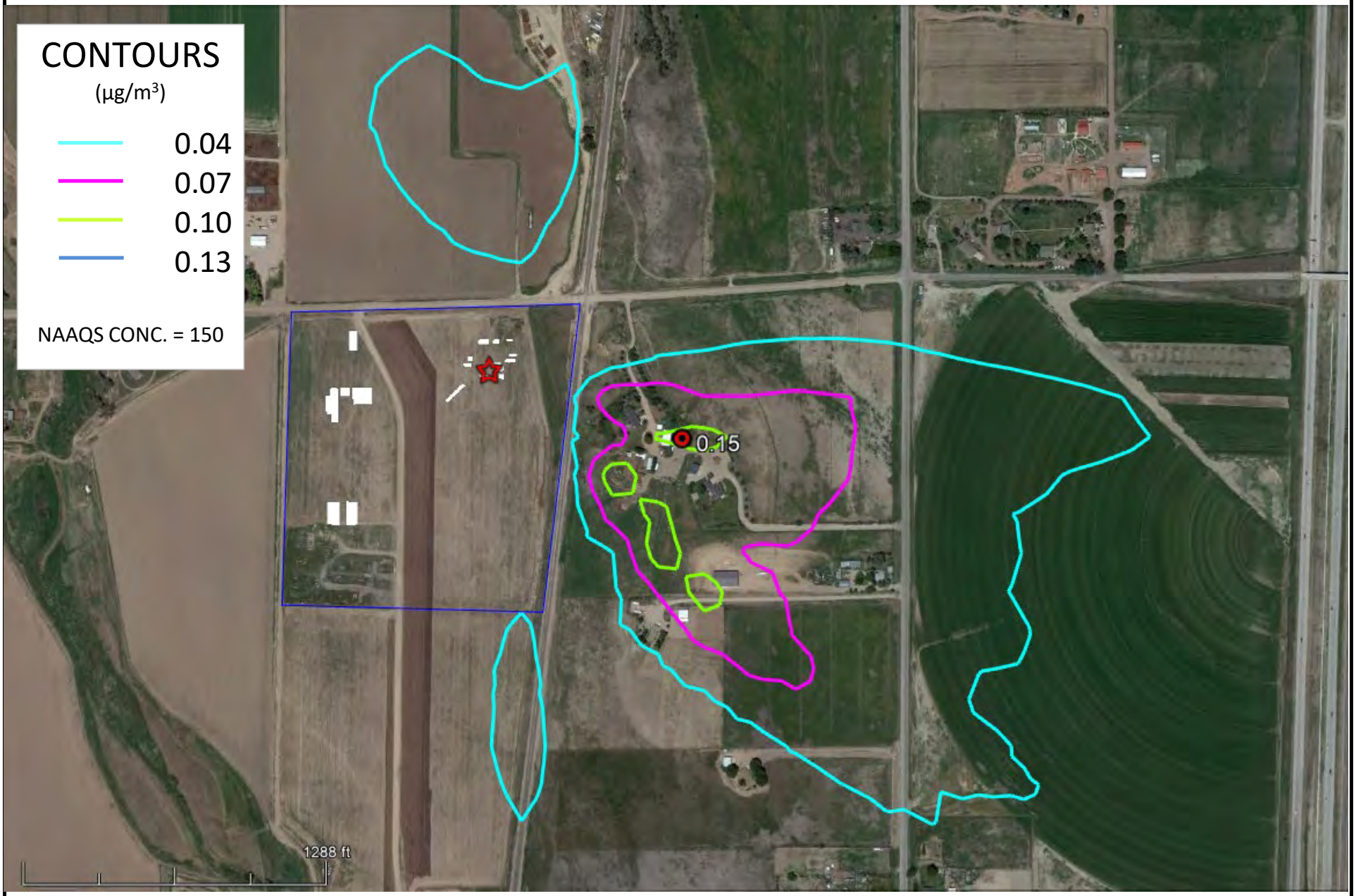


FIGURE 4 - PM 10 MAP (24-HOUR)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
NAAQS CONC. = 150 FIGURE
UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

anteagroup
11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

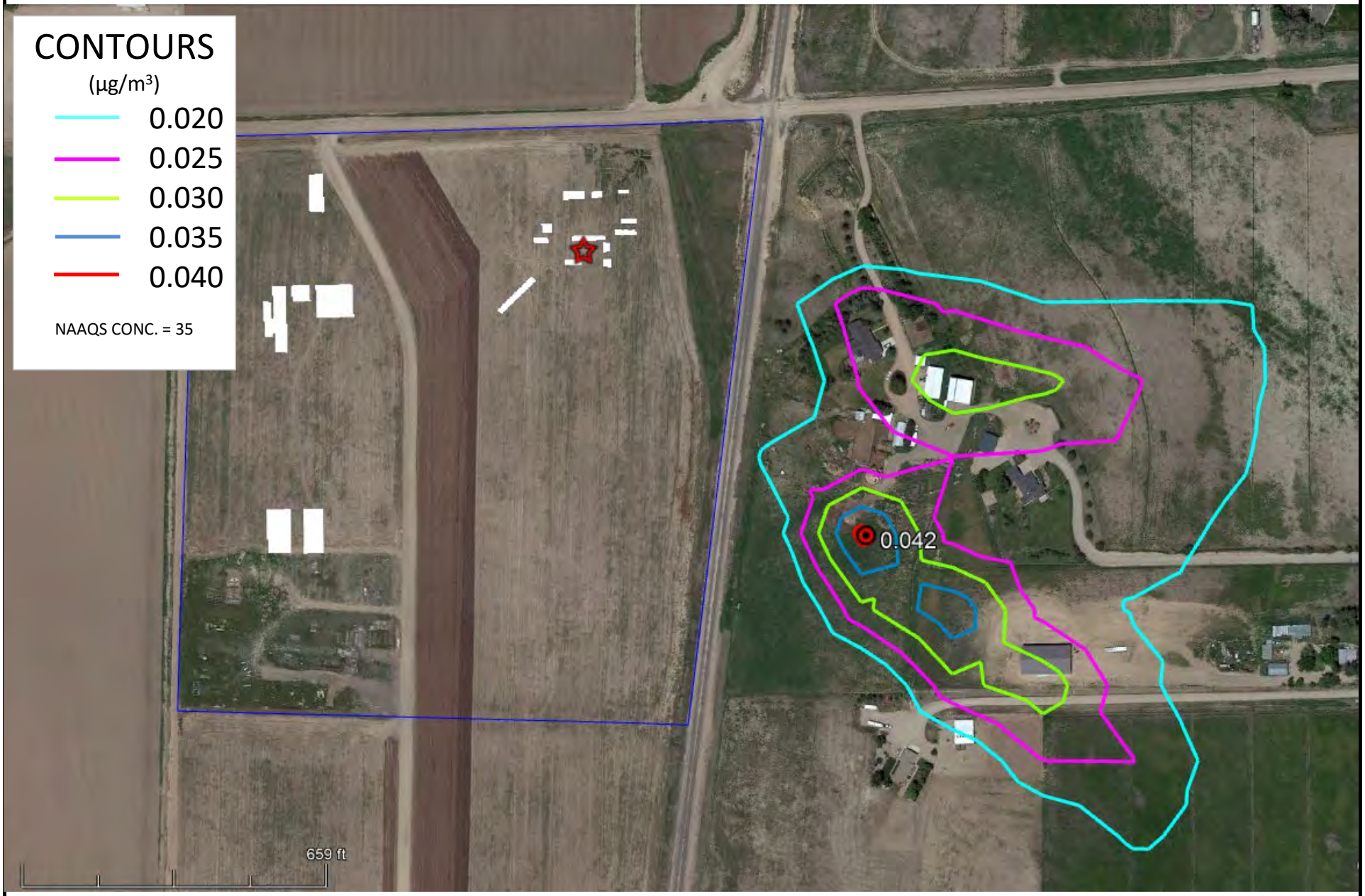


FIGURE 5A - PM 2.5 MAP (24-HOUR)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
NAAQS CONC. = 35
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

antea group

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

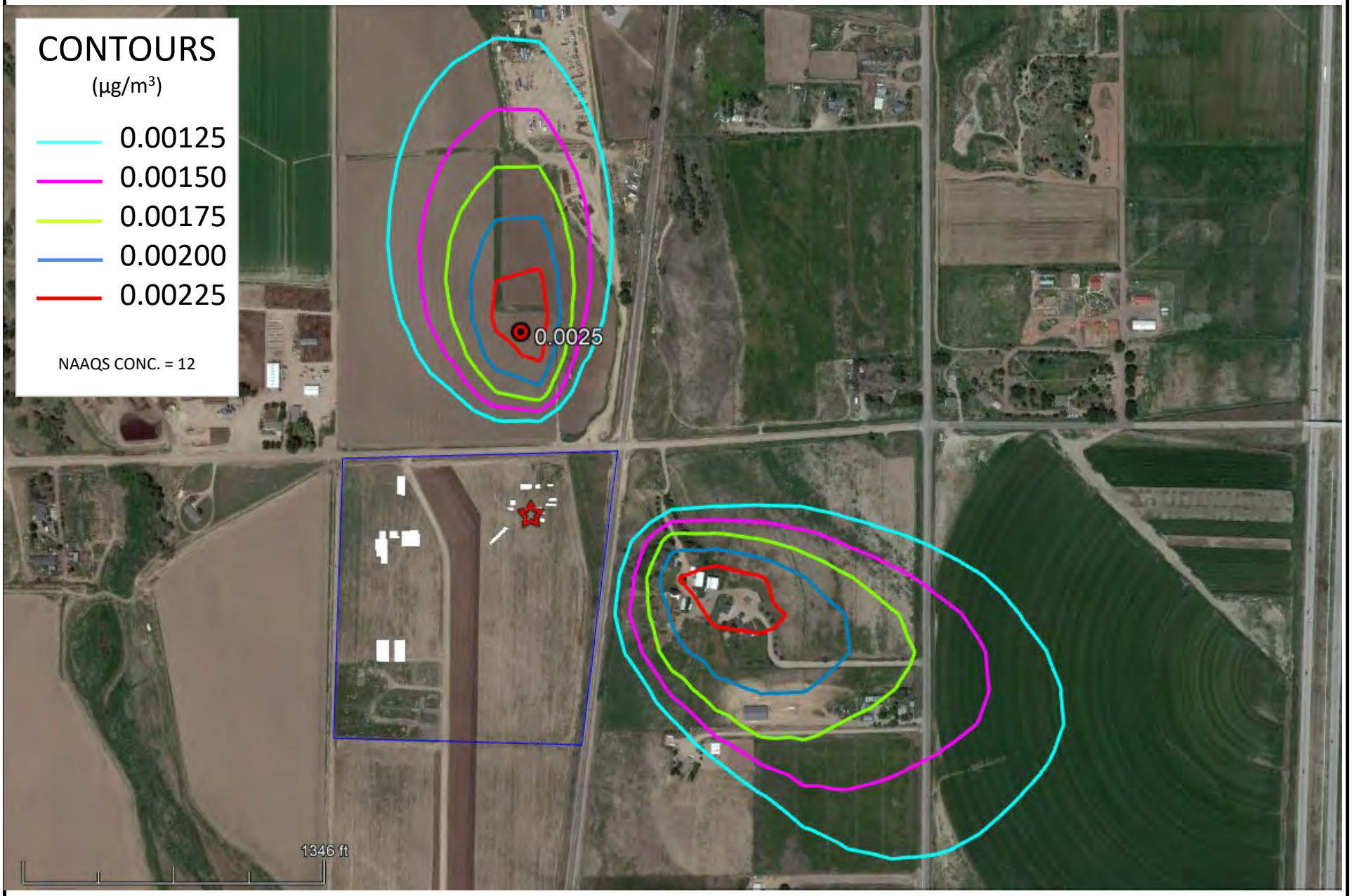


FIGURE 5B - PM 2.5 MAP (1-YEAR)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
NAAQS CONC. = 12
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

antea group

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

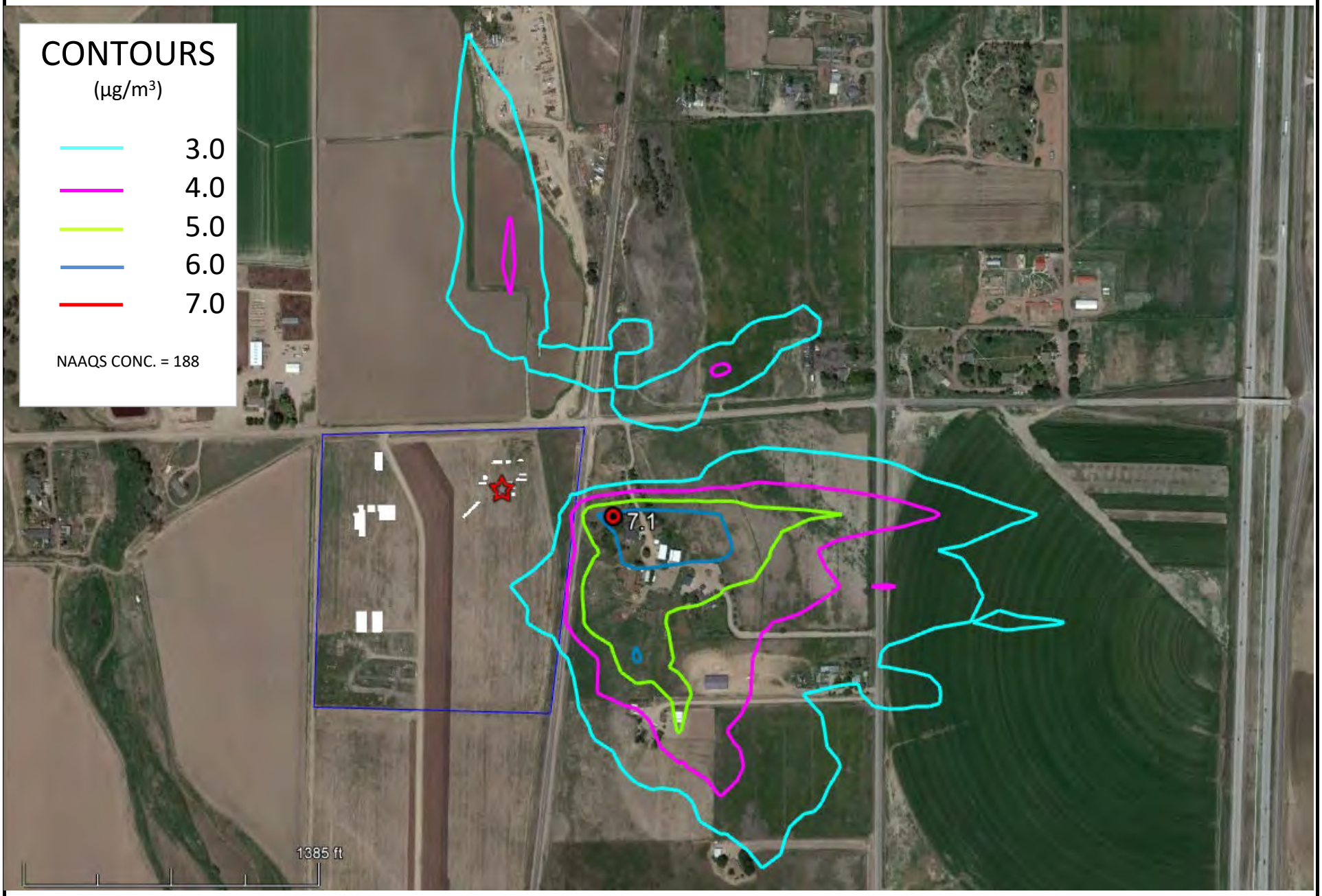


FIGURE 6A - NO2 MAP (1-HOUR)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
NAAQS CONC. = 188
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

antea group

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

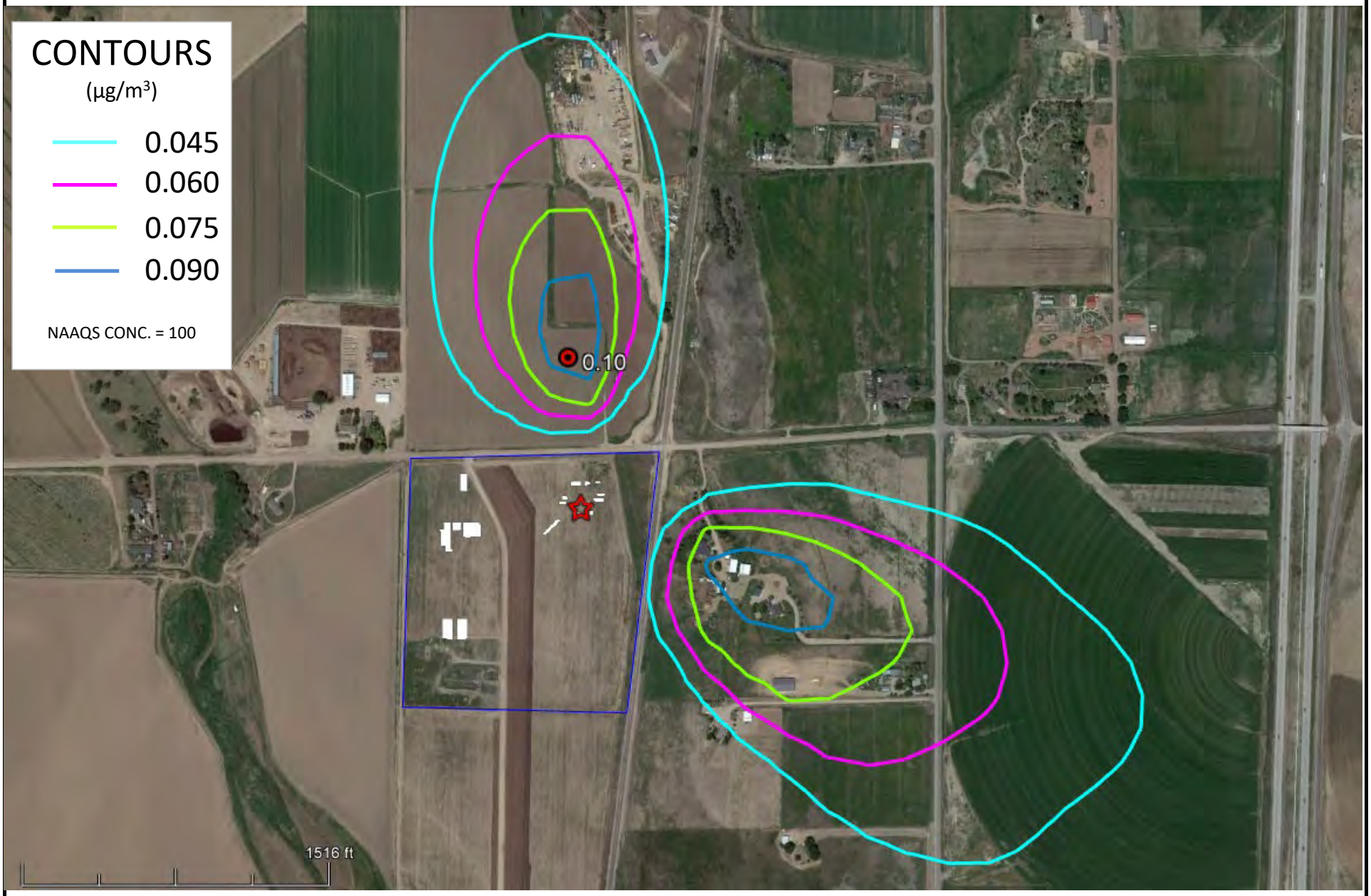


FIGURE 6B - NO2 MAP (1-YEAR)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
NAAQS CONC. = 100
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

antea group

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

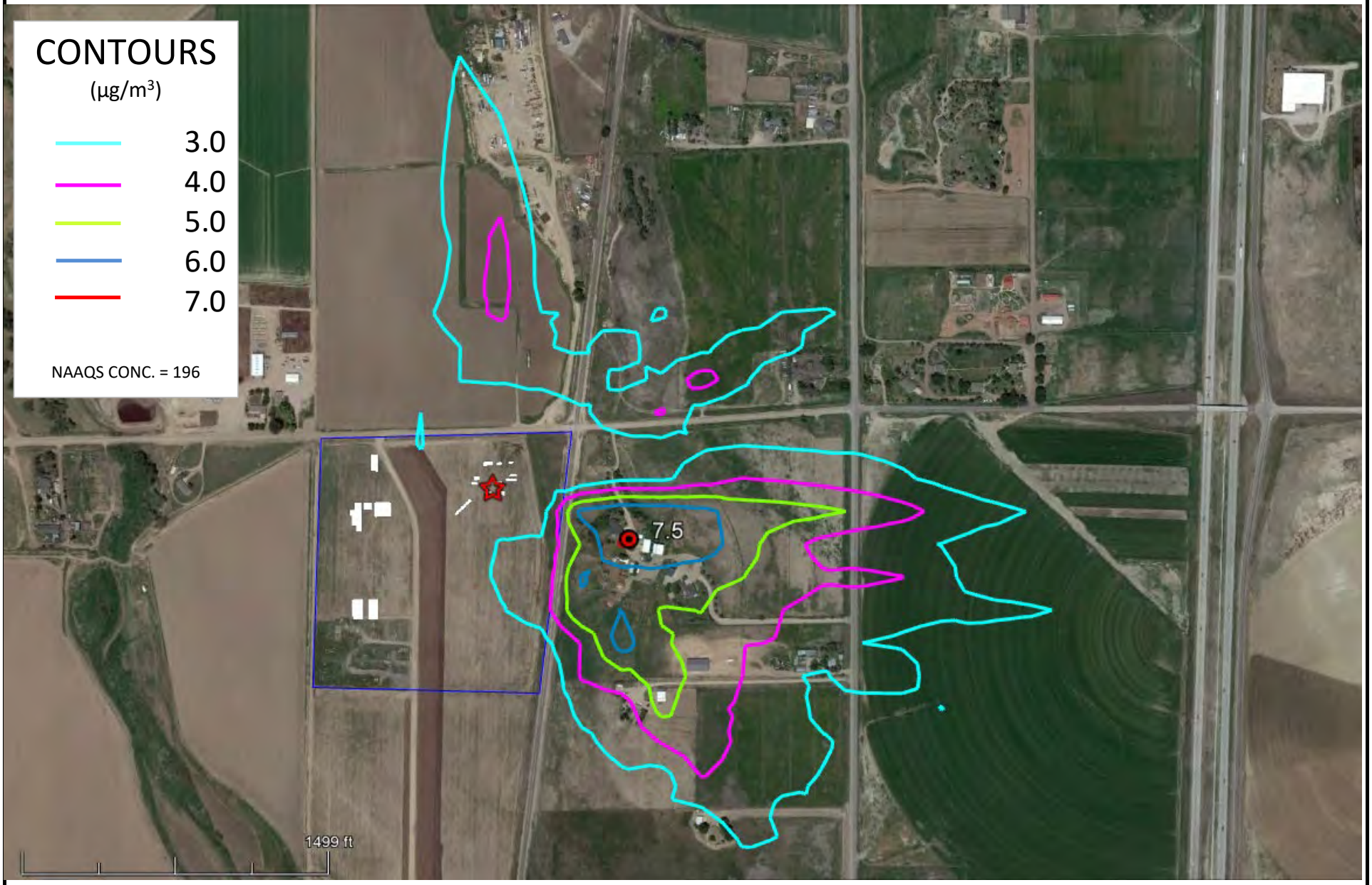


FIGURE 7 - SO2 MAP (1-HOUR)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
NAAQS CONC. = 196
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

antea group

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

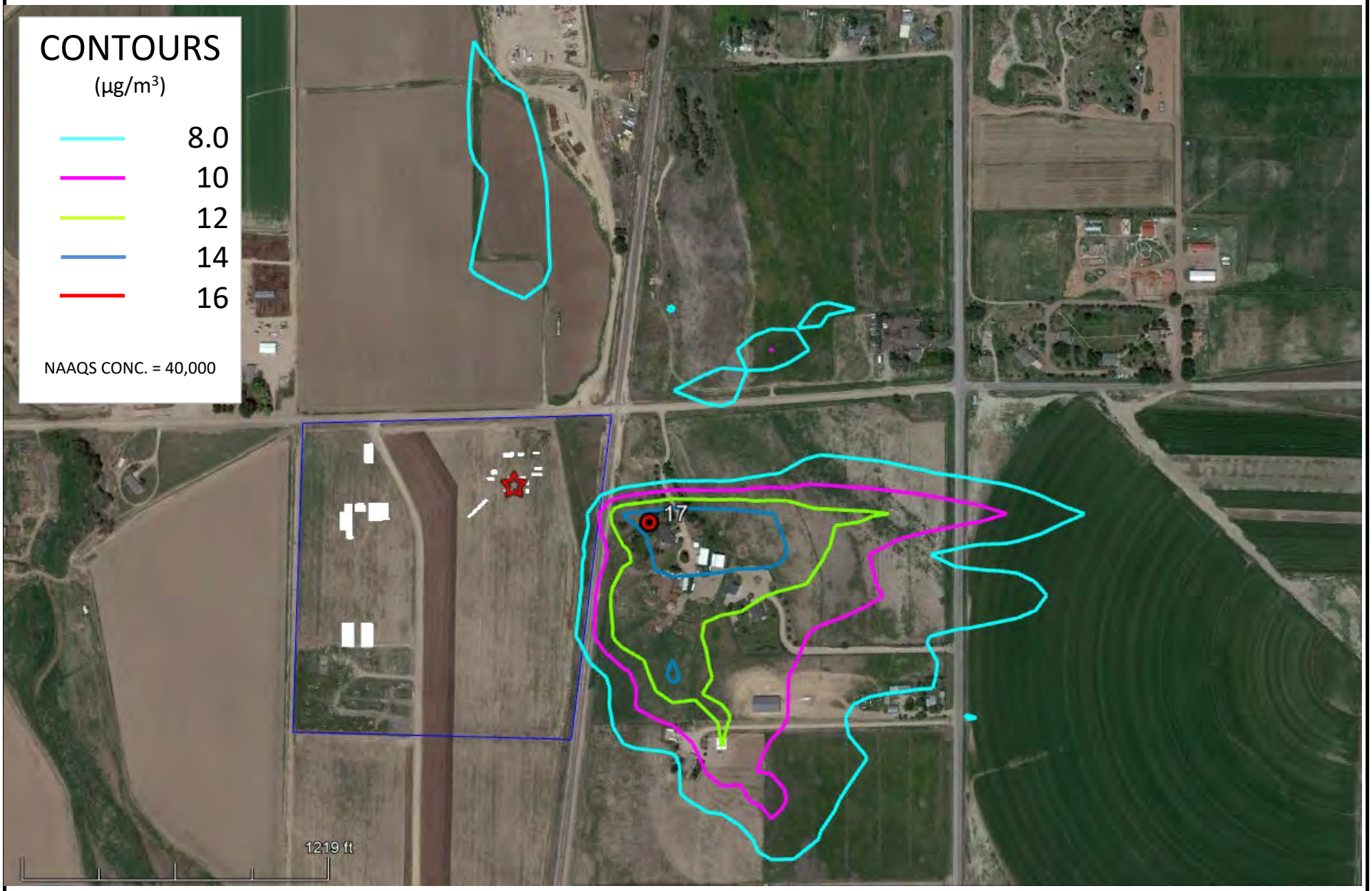


FIGURE 8A - CO MAP (1-HOUR)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
NAAQS CONC. = 40,000
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

antea group
11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

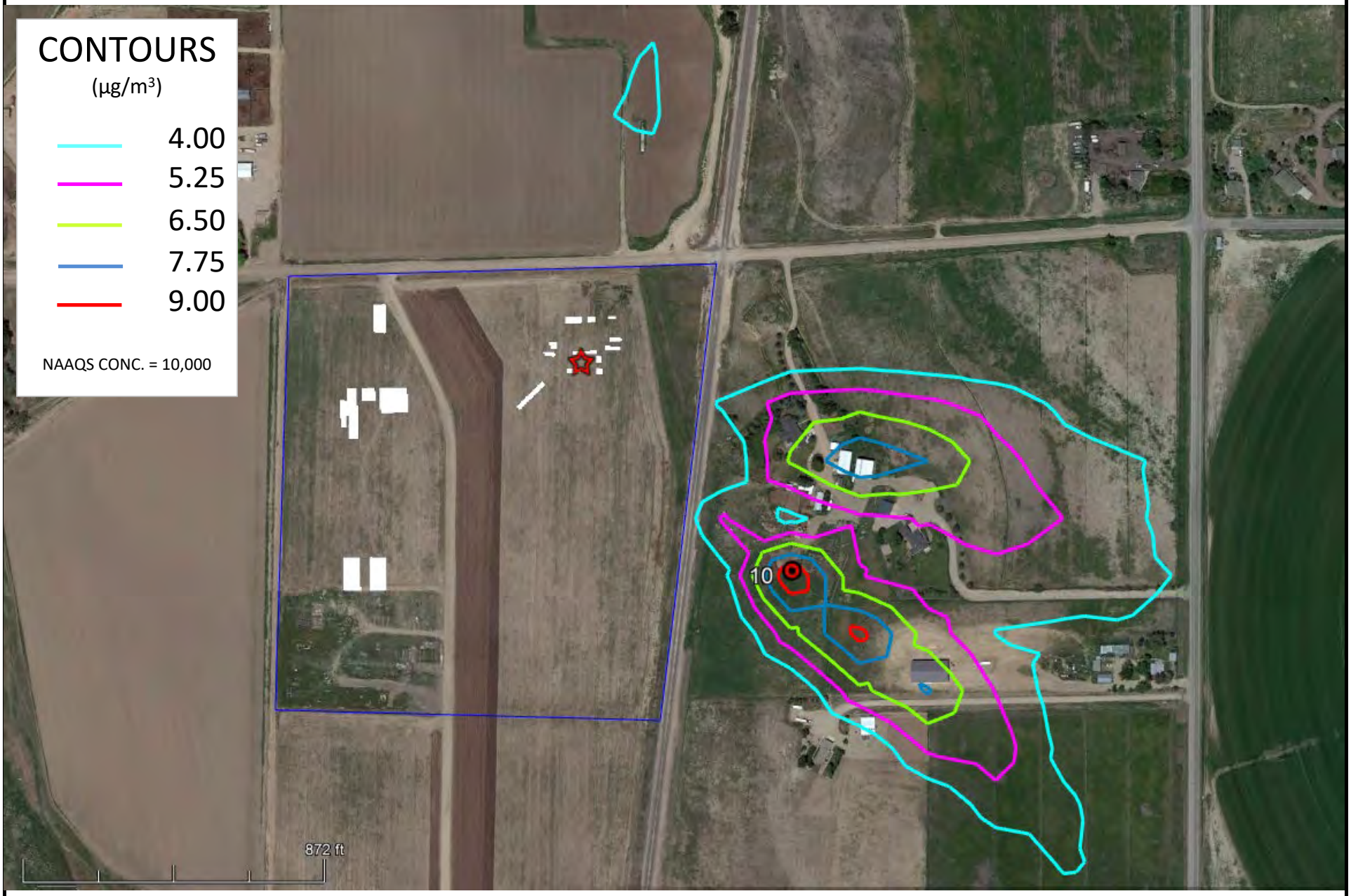


FIGURE 8B - CO MAP (8-HOUR)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
- AIRS ID 001
- MAX CONCENTRATION

NOTES
NAAQS CONC. = 10,000
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

anteagroup

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

FIGURE 9A - ACETALDEHYDE MAP (LONG-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
SCREENING CONC. = 0.45
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

antea group

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

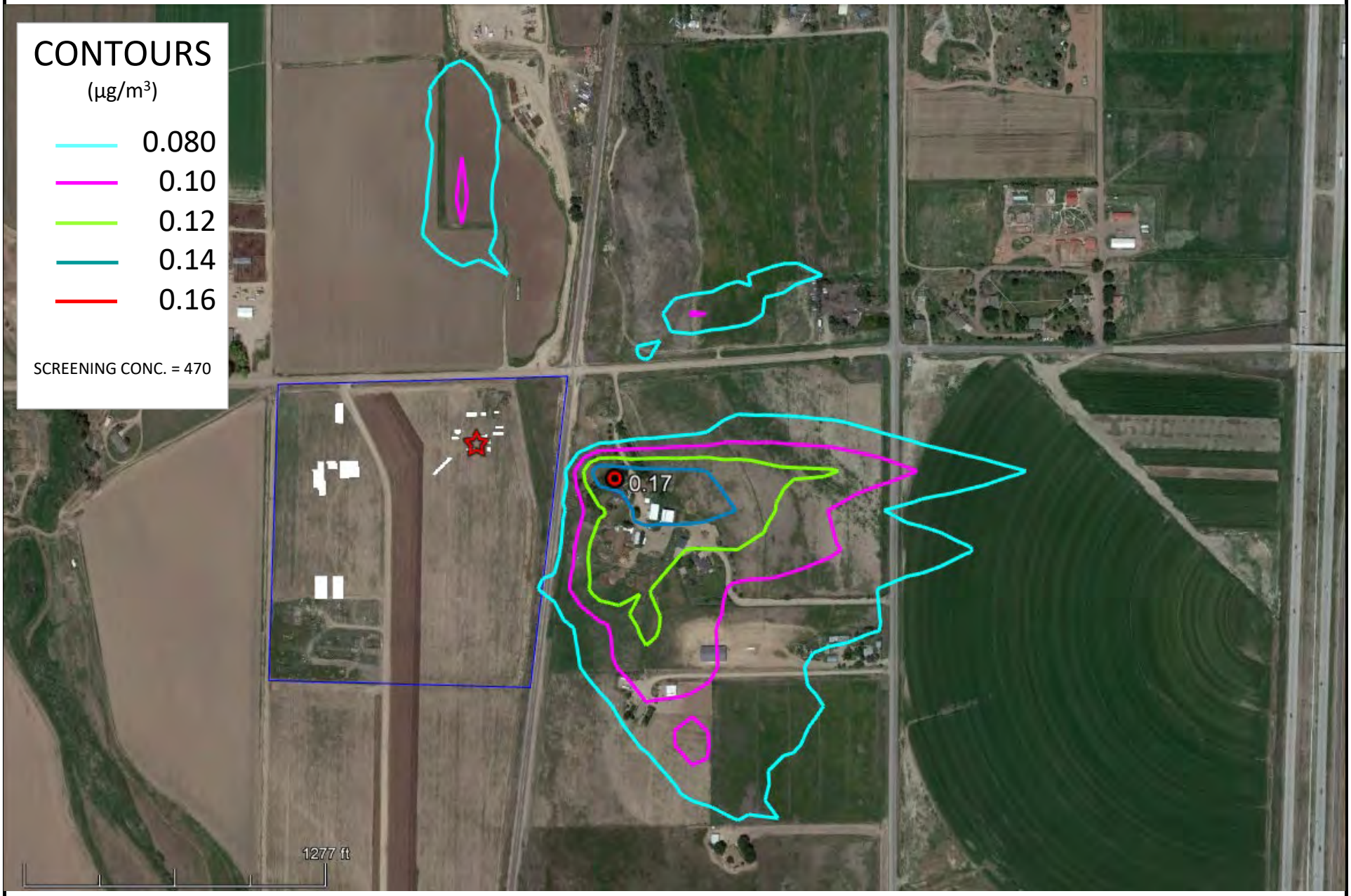


FIGURE 9B - ACETALDEHYDE MAP (SHORT-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
SCREENING CONC. = 470
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

antea group

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

FIGURE 10A - HEXANE MAP (LONG-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
SCREENING CONC. = 70
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

antea group

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

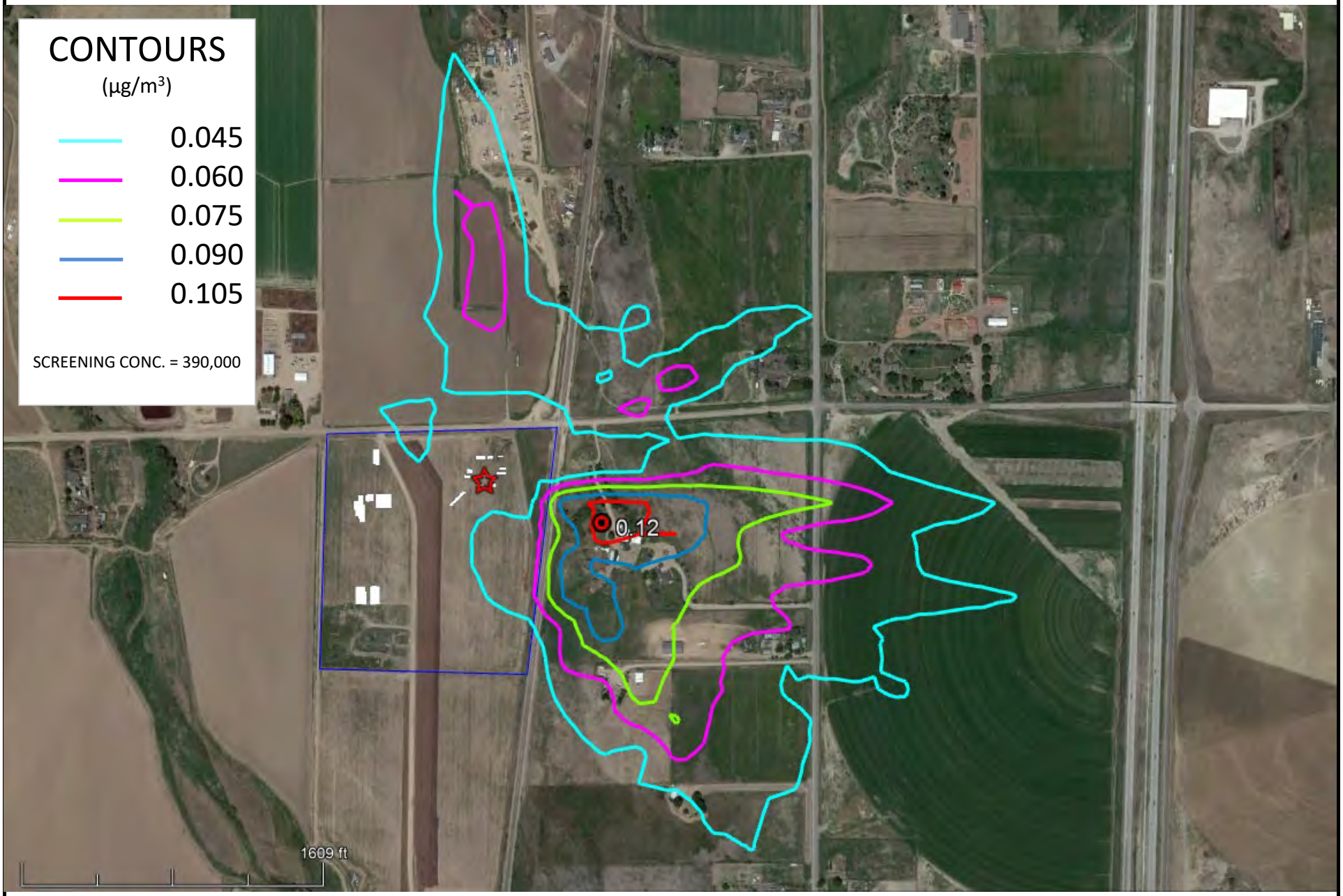


FIGURE 10B - HEXANE MAP (SHORT-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
SCREENING CONC. = 390,000
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

antea group
11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

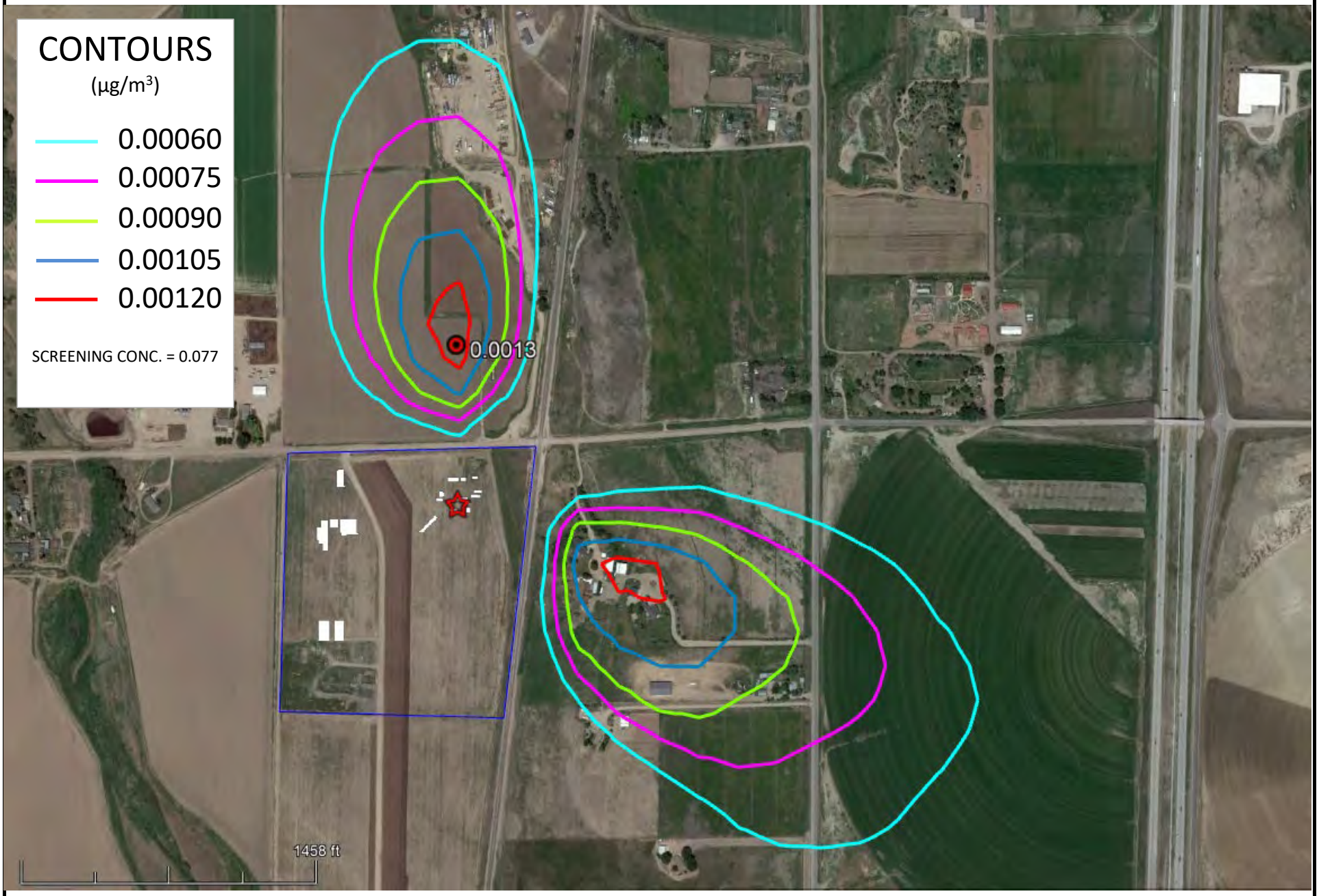


FIGURE 11A - FORMALDEHYDE MAP (LONG-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
SCREENING CONC. = 0.077
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

antea group

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

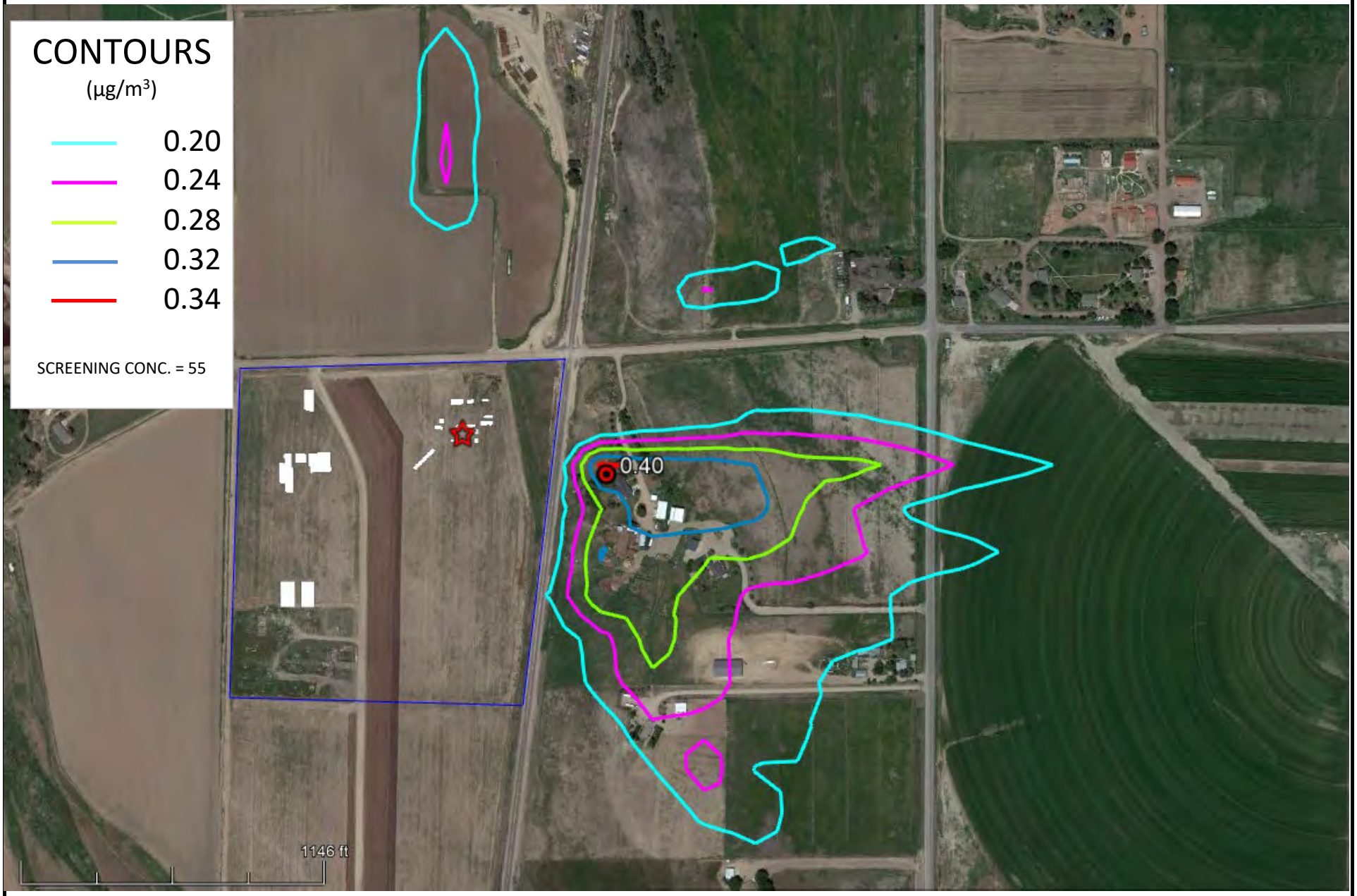


FIGURE 11B - FORMALDEHYDE MAP (SHORT-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
- AIRS ID 001
- MAX CONCENTRATION

NOTES
SCREENING CONC. = 55
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

antea group
11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

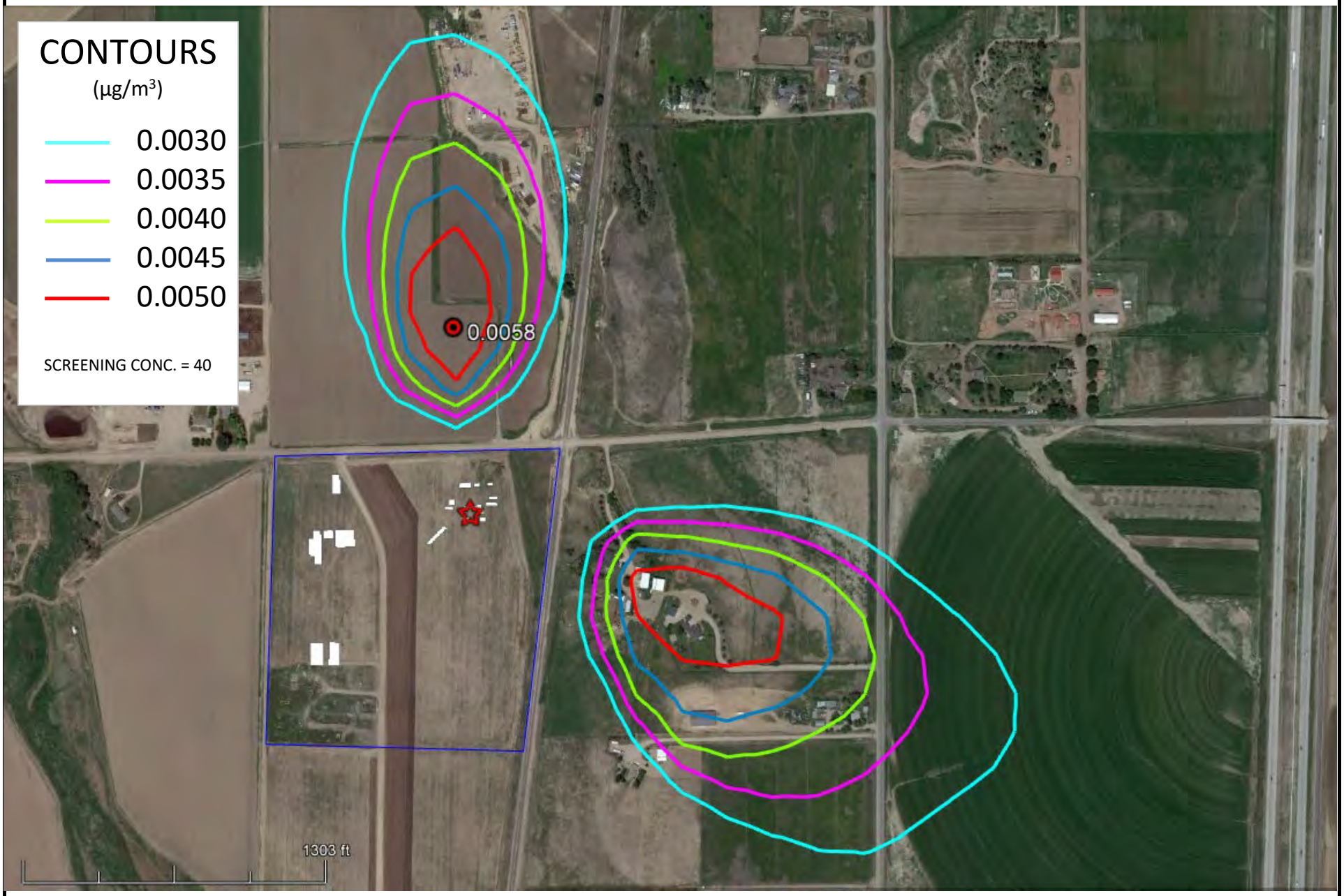


FIGURE 12A - TOLUENE MAP (LONG-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
- AIRS ID 001
- MAX CONCENTRATION

NOTES
SCREENING CONC. = 40
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

anteagroup

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

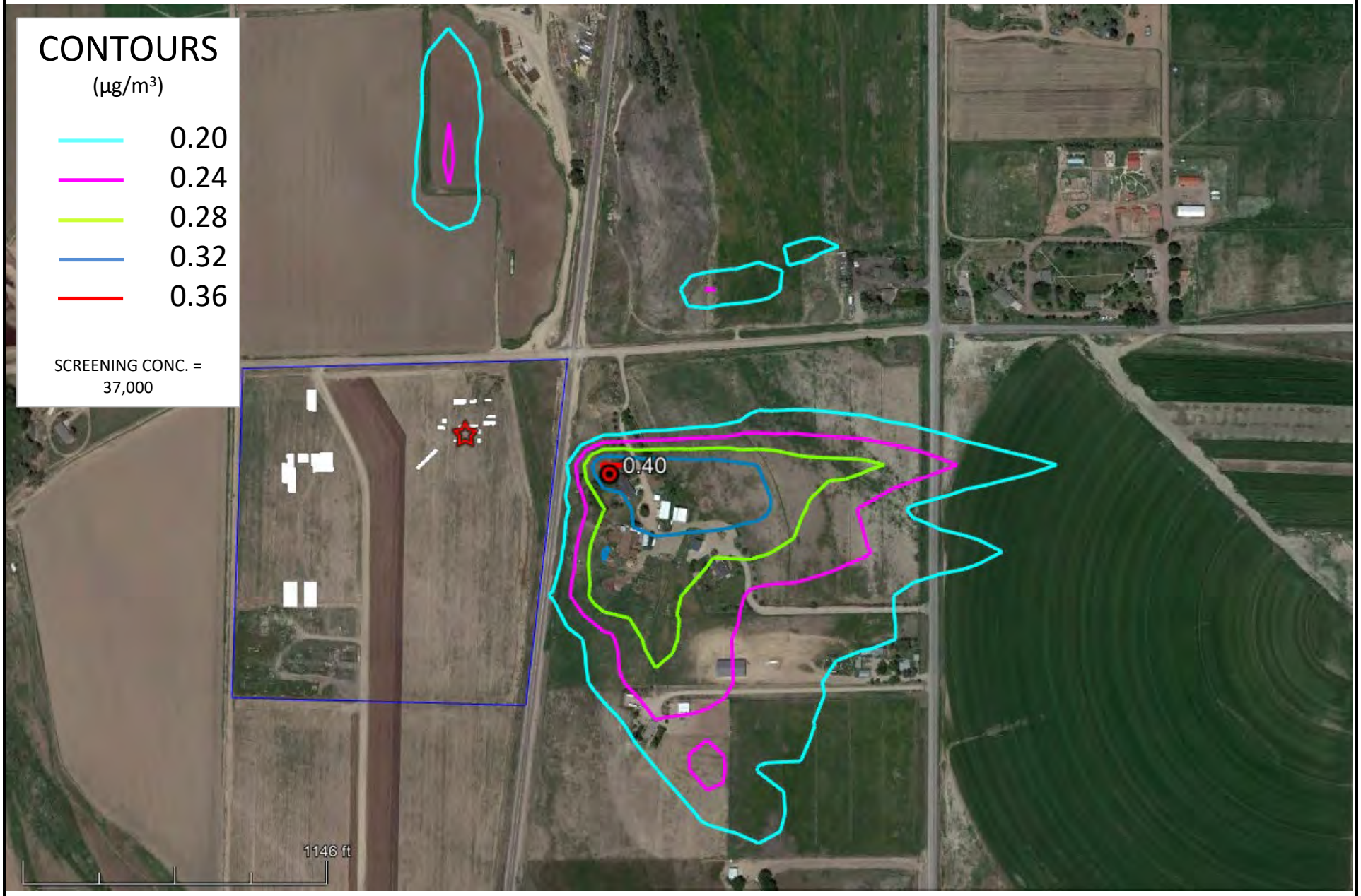


FIGURE 12B - TOLUENE MAP (SHORT-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
- AIRS ID 001
- MAX CONCENTRATION

NOTES
SCREENING CONC. = 37,000
FIGURE UNITS = µg/m3

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

antea group

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

FIGURE 13A - QUINONE MAP (LONG-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
- AIRS ID 001
- MAX CONCENTRATION

NOTES
SCREENING CONC. = N/A
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

antea group
11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

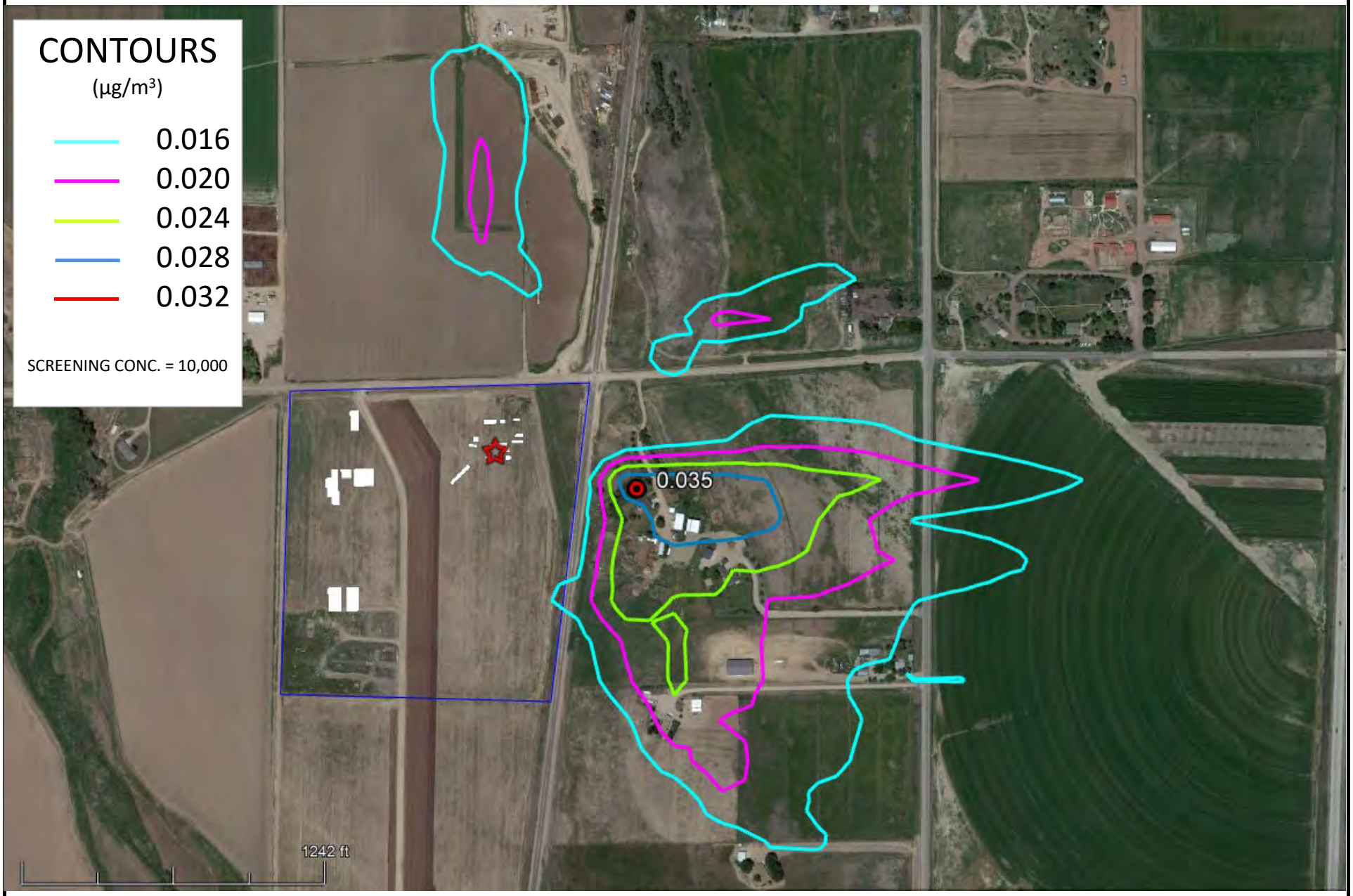


FIGURE 13B - QUINONE MAP (SHORT-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
- AIRS ID 001
- MAX CONCENTRATION

NOTES
SCREENING CONC. = 10,000
FIGURE UNITS = µg/m3

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

anteagroup

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

FIGURE 14A - BENZENE MAP (LONG-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
SCREENING CONC. = 0.13
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

anteagroup

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

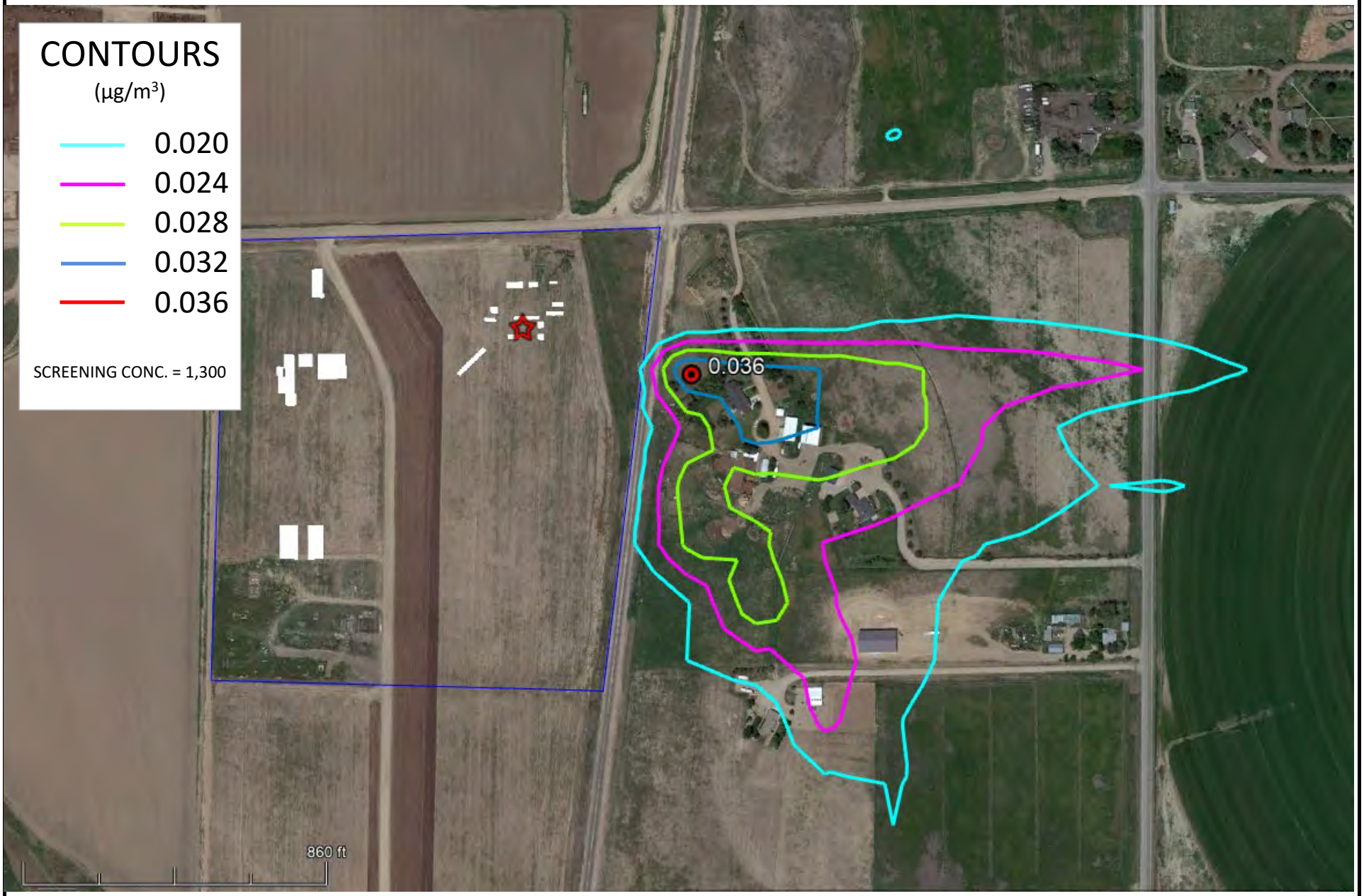


FIGURE 14B - BENZENE MAP (SHORT-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND	NOTES
AIRS ID 001	SCREENING CONC. = 1,300
MAX CONCENTRATION	FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

antea group
11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

FIGURE 15A - ETHYLBENZENE MAP (LONG-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
SCREENING CONC. = 0.4
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

antea group

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

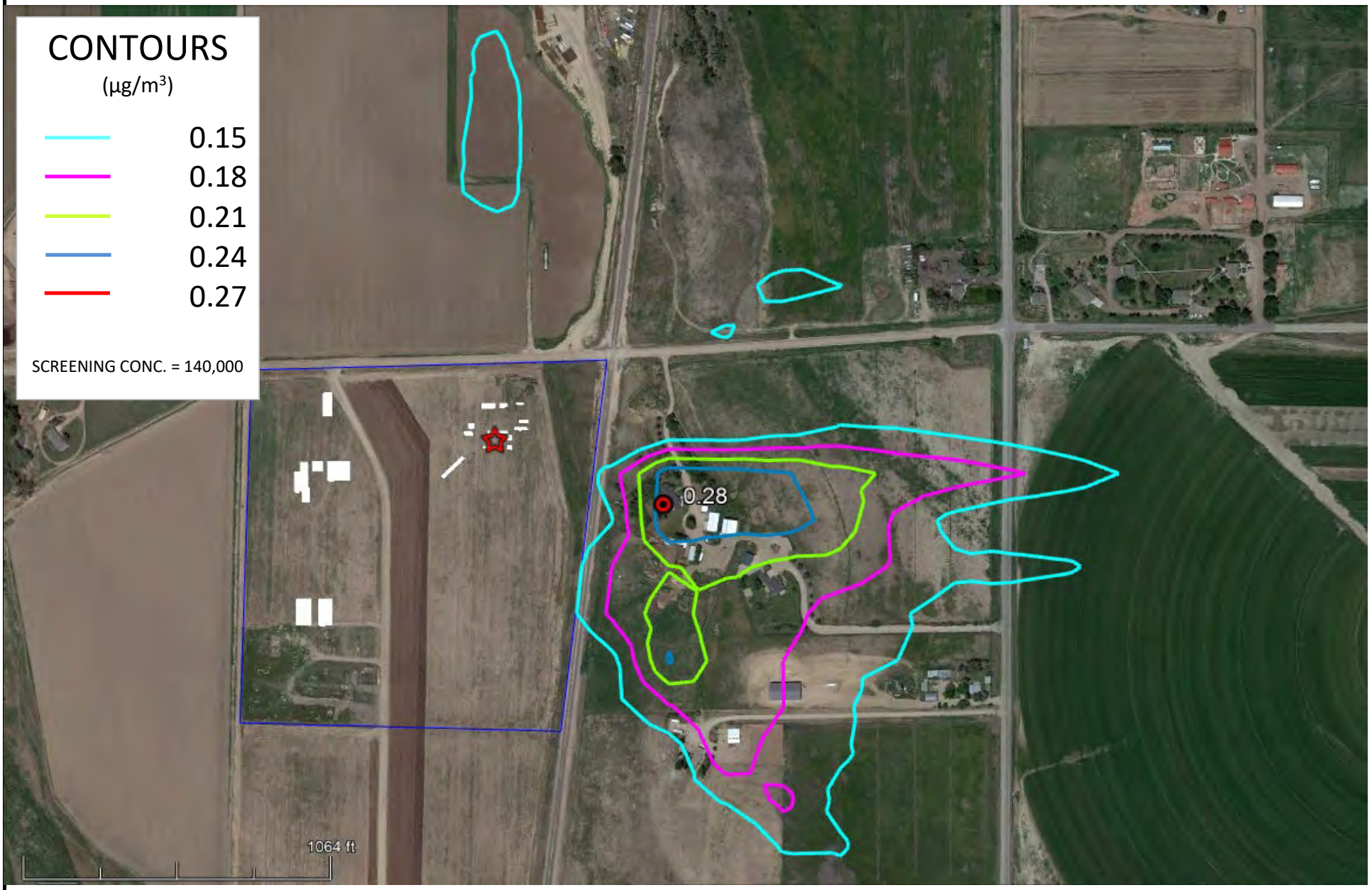


FIGURE 15B - ETHYLBENZENE MAP (SHORT-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
SCREENING CONC. = 140,000
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

anteagroup

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

FIGURE 16A - XYLENE MAP (LONG-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
SCREENING CONC. = 10
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

antea group

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

FIGURE 16B - XYLENE MAP (SHORT-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
SCREENING CONC. = 8,700
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

antea group
11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

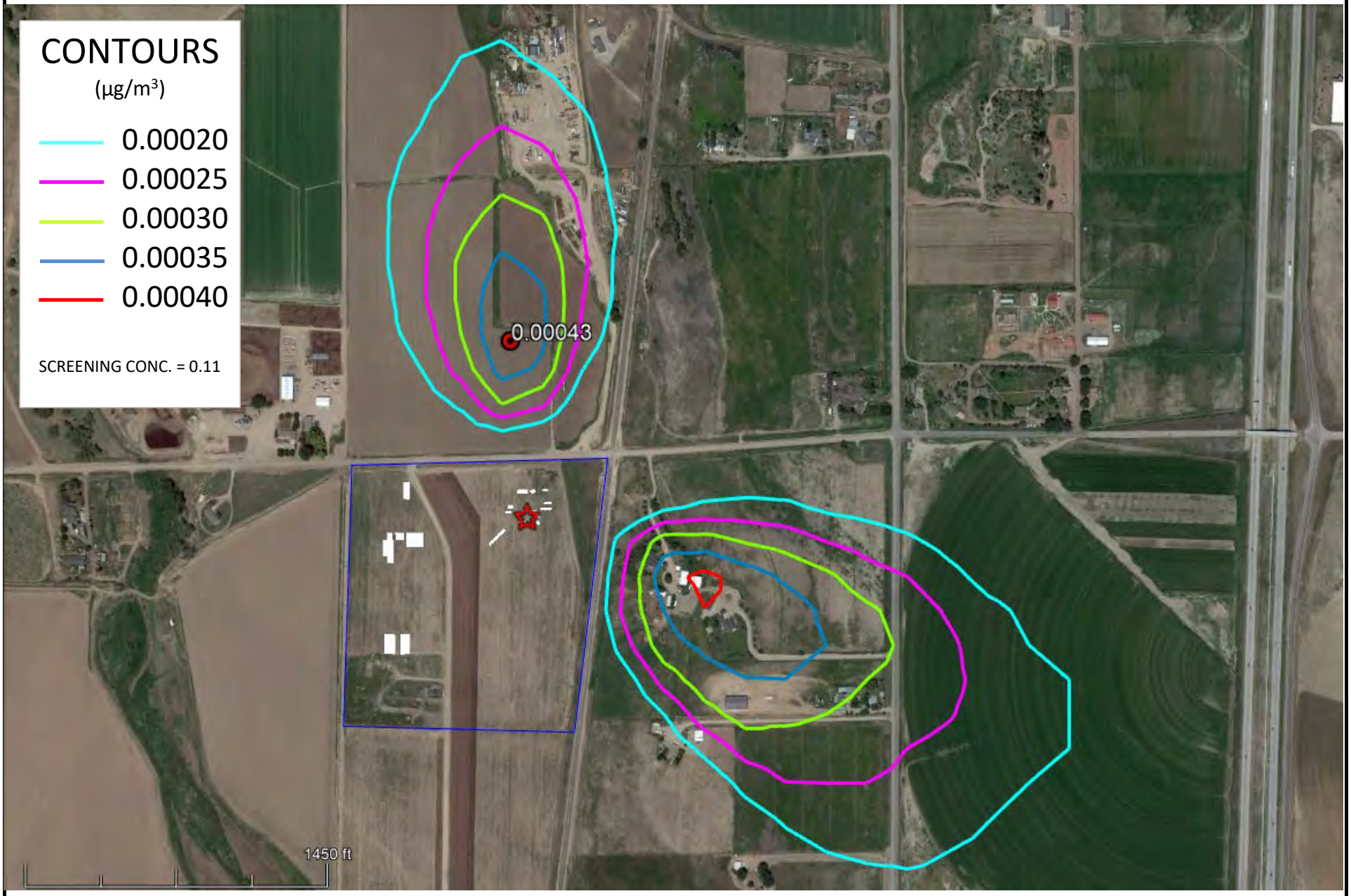


FIGURE 17A - TOTAL PAH MAP (LONG-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
SCREENING CONC. = 0.11
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

antea group

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

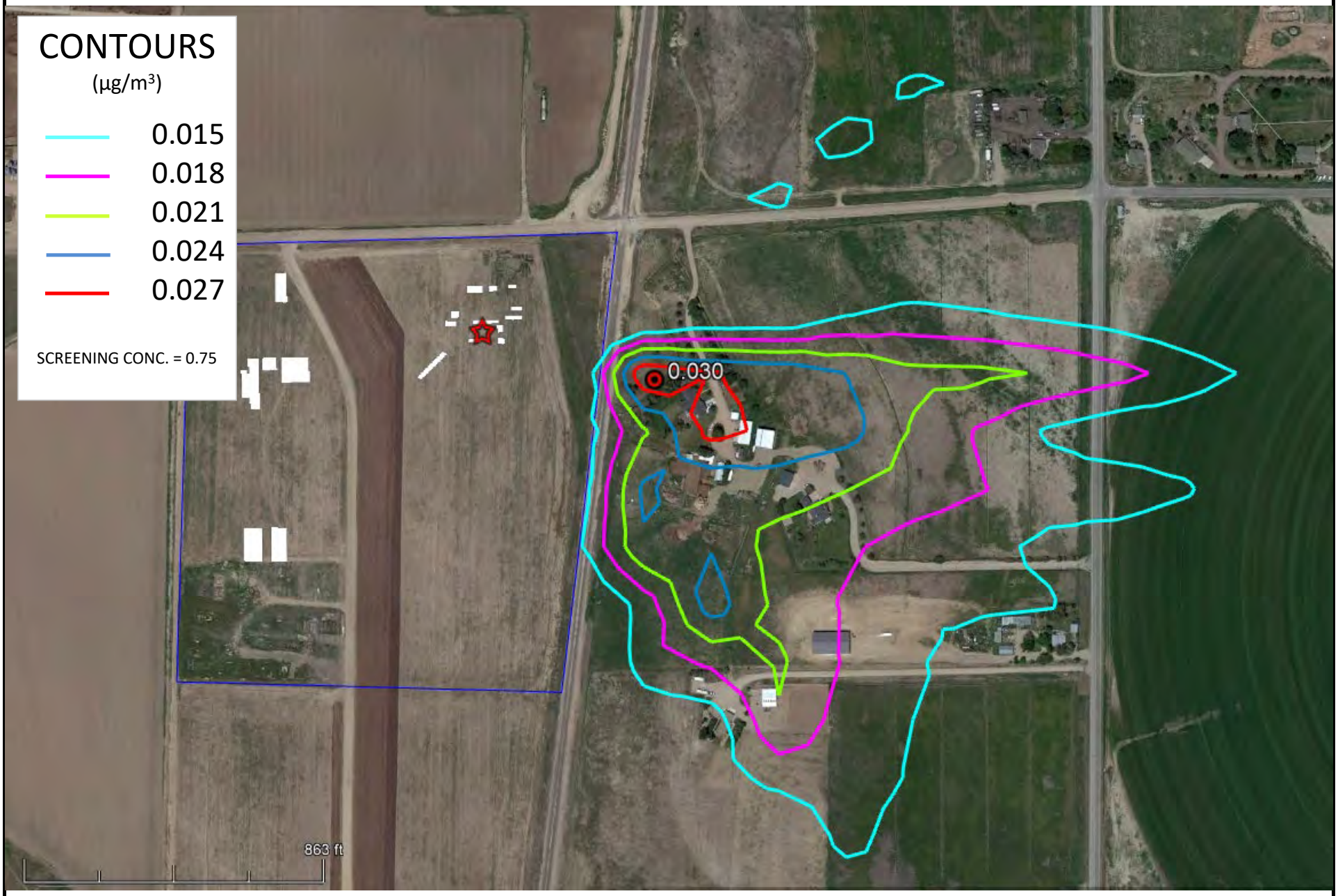


FIGURE 17B - TOTAL PAH MAP (SHORT-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
SCREENING CONC. = 0.75
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

antea group

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

FIGURE 18A - HCL MAP (LONG-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
SCREENING CONC. = 2
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

antea group

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

FIGURE 18B - HCL MAP (SHORT-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
- AIRS ID 001
- MAX CONCENTRATION

NOTES
SCREENING CONC. = N/A
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

antea group

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

Appendix A – Emission Calculations and Supporting Documentation

Appendix saved separately as "Appendix A"

Appendix B – AERMOD Model Output

Appendix saved separately as "Appendix A"

Emission Calculations for Modeling
Connell Resources
Fort Collins, CO and Wellington, CO

Permit Limits

Drum Mixer:	400	tons per hour
HMA Production Limit (tons/yr):	300,000	Air Construction Permit OOLR076
HMA Production Limit (hrs/yr):	750	(@maximum production rate w/ maximum Drum Mixer rate)
HMA Production Limit (hrs/yr):	1,154	(@nominal actual production rate)
Nominal Production Rate:	260	tons per hr

Natural Gas or Propane

Criteria Pollutant	Emission Factor (lb/ton asphalt produced) (Ctl)	Emission Factor Reference	Actual (lbs/hr)	Potential (lbs/hr)	Actual (tpy)	Potential (tpy)	Permit Limits (tpy)
PM	0.0177	AP-42, Table 11.1-3	4.60	7.08	2.7	2.7	2.7
PM-10	0.0041	AP-42, Table 11.1-3	1.07	1.64	0.6	0.6	0.7
PM-2.5	0.0010	AP-42, Table 11.1-4	0.26	0.40	0.2	0.2	0.2
NOx	0.026	AP-42, Table 11.1-7	6.76	10.40	3.9	3.9	8.3
SO_2	0.0034	AP-42, Table 11.1-8	0.88	1.36	0.5	0.5	8.7
VOC	0.0320	AP-42, Table 11.1-7	8.32	12.80	4.8	4.8	4.8
CO	0.13	stack tests	33.80	52.00	19.5	19.5	19.5

- Actual Emissions (tpy) = Actual (lbs/hr) x Nominal Production Rate (hrs/yr) / 2,000 lbs/yr
- Potential Emissions (tpy) = Potential (lbs/hr) x Maximum Production Rate (hrs/yr) / 2,000 lbs/yr

Waste Oil

Criteria Pollutant	Emission Factor (lb/ton asphalt produced) (Ctl)	Emission Factor Reference	Actual (lbs/hr)	Potential (lbs/hr)	Actual (tpy)	Potential (tpy)	Permit Limits (tpy)
PM	0.0177	AP-42, Table 11.1-3	4.60	7.08	2.7	2.7	2.7
PM-10	0.0041	AP-42, Table 11.1-3	1.07	1.64	0.6	0.6	0.7
PM-2.5	0.0010	AP-42, Table 11.1-4	0.26	0.40	0.2	0.2	0.2
NOx	0.055	AP-42, Table 11.1-7	14.30	22.00	8.3	8.3	8.3
SO_2	0.058	AP-42, Table 11.1-8	15.08	23.20	8.7	8.7	8.7
VOC	0.0320	AP-42, Table 11.1-7	8.32	12.80	4.8	4.8	4.8
CO	0.13	stack tests	33.80	52.00	19.5	19.5	19.5

HAP Pollutant	Emission Factor (lb/ton asphalt produced	Emission Factor Reference	Actual (lbs/hr)	Potential (lbs/hr)	Actual (lbs/yr)	Potential (lbs/yr)	Permit Limits (lbs/yr)
Acetaldehyde	0.0013	AP-42, Table 11.1-10 *(p. 11.1-26)*	0.338	0.520	390	390	390
Hexane	0.00092	AP-42, Table 11.1-10 *(p. 11.1-21)*	0.2392	0.368	276	276	285.9
Formaldehyde	0.000689	Michigan Department of Environmental Quality [(1)]	0.179	0.276	206.7	206.7	930
Toluene (NG)	0.00015	AP-42, Table 11.1-10 *(p. 11.1-21)*	0.039	0.060	45	45	870
Toluene (WO)	0.0029	AP-42, Table 11.1-10 *(p. 11.1-26)*	0.754	1.160	870	870	
Quinone (NG)	0.00027	AP-42, Table 11.1-9 *(p. 11.1-19)*	0.0702	0.108	81	81	
Quinone (WO)	0.00016	AP-42, Table 11.1-10 *(p. 11.1-26)*	0.0416	0.064	48	48	
Benzene (WO), (NG)	0.00028	AP-42, Table 11.1-9 *(p. 11.1-20)*	0.0728	0.112	84	84	
Ethylbenzene (WO), (NG)	0.0022	AP-42, Table 11.1-9 *(p. 11.1-19)*	0.572	0.880	660	660	
Xylene (WO), (NG)	0.0027	AP-42, Table 11.1-9 *(p. 11.1-19)*	0.702	1.080	810	810	
Total PAH (NG)	0.00011	AP-42, Table 11.1-10 *(p. 11.1-19)*	0.0286	0.044	33	33	
Total PAH (WO)	0.00023	AP-42, Table 11.1-9 *(p. 11.1-20)*	0.0598	0.092	69	69	
HCl (WO - Only)., NG - ND)	0.00021	AP-42, Table 11.1-8 *(p. 11.1-18)*	0.0546	0.084	63	63	

NG = Natural Gas
WO = Waste Oil
ND = Non Detect

[(1)] "*Eliminate the Manatory Testing Requirements for Toxic Air Contaminates for Hot Mix Asphalt Plants in Michigan* ", Michigan Department of Environmental Quality - Air Division, June 1, 2012

- Actual (lbs/hr) = EF x Nominal Production Rate (tons/hr)
- Actual (lbs/hr) = EF x Maximum Drum Mixer Production Rate (tons/hr)
- Potential (lbs/yr) = Actual (lbs/hr) x Nominal Production Rate (hrs/yr)
- Actual (lbs/yr) = Actual (lbs/hr) x Maximum Nominal Production Rate (hrs/yr)

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** MODEL SETUP OPTIONS SUMMARY ***

** Model Options Selected:

* Model Uses Regulatory DEFAULT Options
* Model Is Setup For Calculation of Average CONCentration Values.
* NO GAS DEPOSITION Data Provided.
* NO PARTICLE DEPOSITION Data Provided.
* Model Uses NO DRY DEPLETION. DDPLETE = F
* Model Uses NO WET DEPLETION. WETDPLT = F
* Stack-tip Downwash.
* Model Accounts for ELEVated Terrain Effects.
* Use Calms Processing Routine.
* Use Missing Data Processing Routine.
* No Exponential Decay.
* Model Uses RURAL Dispersion Only.
* BULKRN - Use BULKRN Delta-T and SolarRad option for SBL in AERMET
* Model Assumes No FLAGPOLE Receptor Heights.
* The User Specified a Pollutant Type of: PARTMATT

**Model Calculates 1 Short Term Average(s) of: 24-HR

**This Run Includes: 1 Source(s); 1 Source Group(s); and 3106 Receptor(s)

with: 1 POINT(s), including

0 POINTCAP(s) and 0 POINTHOR(s)

and: 0 VOLUME source(s)

and: 0 AREA type source(s)

and: 0 LINE source(s)

and: 0 RLINE/RLINEXT source(s)

and: 0 OPENPIT source(s)

and: 0 BUOYANT LINE source(s) with a total of 0 line(s)

and: 0 SWPOINT source(s)

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 22112

**Output Options Selected:

Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours

m for Missing Hours

b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1730.68 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0

Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07

Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 3.9 MB of RAM.

**Input Runstream File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**Output Print File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**File for Summary of Results: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***

(1=YES; 0=NO)

1 1 1

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***

(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling
Met Version: 22112

Profile file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling

Surface format: FREE

Profile format: FREE

Surface station no.: 0 Upper air station no.: 23062

Name: UNKNOWN Name: DENVER WSFO, CO

Year: 2006 Year: 2006

First 24 hours of scalar data

YR MO DY JDY HR H0 U* W* DT/DZ ZICNV ZIMCH M-O LEN Z0 BOWEN ALBEDO REF WS WD HT REF TA HT

- -

06 01 01 1 01 -26.0 0.162 -9.000 -9.000 -999. 157. 11.8 0.01 1.89 1.00 4.43 326. 10.0 280.1 2.0

06 01 01 1 02 -58.1 0.325 -9.000 -9.000 -999. 445. 42.5 0.01 1.89 1.00 6.57 310. 10.0 281.4 2.0

06 01 01 1 03 -33.0 0.292 -9.000 -9.000 -999. 380. 54.5 0.01 1.89 1.00 5.72 272. 10.0 281.0
2.0

06 01 01 1 04 -14.9 0.128 -9.000 -9.000 -999. 134. 10.2 0.01 1.89 1.00 3.67 320. 10.0 279.8
2.0

06 01 01 1 05 -13.5 0.124 -9.000 -9.000 -999. 105. 10.1 0.01 1.89 1.00 3.71 337. 10.0 279.0
2.0

06 01 01 1 06 -18.3 0.176 -9.000 -9.000 -999. 177. 21.3 0.01 1.89 1.00 4.29 344. 10.0 278.3
2.0

06 01 01 1 07 -34.9 0.286 -9.000 -9.000 -999. 367. 48.1 0.01 1.89 1.00 5.68 327. 10.0 279.3
2.0

06 01 01 1 08 -39.7 0.440 -9.000 -9.000 -999. 701. 154.4 0.01 1.89 1.00 7.96 307. 10.0 279.8
2.0

06 01 01 1 09 -17.3 0.580 -9.000 -9.000 -999. 1058. 810.0 0.01 1.89 0.43 10.10 287. 10.0 279.4
2.0

06 01 01 1 10 38.3 0.682 0.602 0.005 164. 1349. -597.0 0.01 1.89 0.31 11.67 301. 10.0 280.9
2.0

06 01 01 1 11 83.4 0.893 1.120 0.005 486. 2020. -616.6 0.01 1.89 0.26 15.29 291. 10.0 281.4
2.0

06 01 01 1 12 97.2 0.889 1.326 0.005 693. 2013. -521.8 0.01 1.89 0.24 15.20 293. 10.0 281.3
2.0

06 01 01 1 13 137.5 0.968 1.629 0.005 909. 2279. -476.9 0.01 1.89 0.24 16.54 291. 10.0
281.3 2.0

06 01 01 1 14 122.9 0.912 1.653 0.005 1063. 2100. -445.7 0.01 1.89 0.25 15.56 290. 10.0
281.0 2.0

06 01 01 1 15 67.7 0.795 1.385 0.005 1138. 1727. -536.6 0.01 1.89 0.30 13.59 295. 10.0
280.1 2.0

06 01 01 1 16 0.0 0.715 -9.000 -9.000 -999. 1464. 8888.0 0.01 1.89 0.41 12.34 301. 10.0 279.0
2.0

06 01 01 1 17 0.0 0.673 -9.000 -9.000 -999. 1330. 8888.0 0.01 1.89 0.72 11.62 304. 10.0 277.1
2.0

06 01 01 1 18 0.0 0.546 -9.000 -9.000 -999. 987. 8888.0 0.01 1.89 1.00 9.43 293. 10.0 275.9
2.0

06 01 01 1 19 -46.9 0.630 -9.000 -9.000 -999. 1199. 388.5 0.01 1.89 1.00 11.09 294. 10.0 276.2
2.0

06 01 01 1 20 -49.7 0.337 -9.000 -9.000 -999. 566. 55.9 0.01 1.89 1.00 6.57 310. 10.0 275.6 2.0

06 01 01 1 21 -29.5 0.194 -9.000 -9.000 -999. 235. 17.9 0.01 1.89 1.00 4.69 313. 10.0 274.4 2.0

06 01 01 1 22 -29.9 0.238 -9.000 -9.000 -999. 279. 32.8 0.01 1.89 1.00 5.32 338. 10.0 275.8 2.0

06 01 01 1 23 -15.8 0.134 -9.000 -9.000 -999. 123. 11.1 0.01 1.89 1.00 3.67 241. 10.0 274.5 2.0

06 01 01 1 24 -19.1 0.117 -9.000 -9.000 -999. 96. 6.1 0.01 1.89 1.00 3.98 279. 10.0 273.6 2.0

First hour of profile data

YR MO DY HR HEIGHT F WDIR WSPD AMB_TMP sigmaA sigmaW sigmaV

06 01 01 01 2.0 0 -999. -99.00 280.1 99.0 -99.00 -99.00

06 01 01 01 10.0 0 326. 4.43 282.0 5.4 -99.00 0.42

06 01 01 01 60.0 1 316. 5.10 283.1 6.1 -99.00 0.54

F indicates top of profile (=1) or below (=0)

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:14:59

PAGE 4

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PARTMATT IN MICROGRAMS/M**3 **

DATE NETWORK

GROUP ID AVERAGE CONC (YYMMDDHH) RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

- -

ALL HIGH 1ST HIGH VALUE IS 0.14871 ON 06092324: AT (499650.00, 4508050.00, 1606.22, 1606.22, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:14:59

PAGE 5

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)

A Total of 624 Warning Message(s)

A Total of 142 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 1 Calm Hours Identified

A Total of 141 Missing Hours Identified (1.61 Percent)

******** FATAL ERROR MESSAGES ********

*** NONE ***

******** WARNING MESSAGES ********

ME W181 3169 MEOPEN: BULKRN Delta-T & SolarRad option for SBL was used in AERMET

MX W403 3169 PFLCNV: Turbulence data is being used w/o ADJ_U* option SigA Data

MX W479 24 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 29 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 30 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 31 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 48 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 51 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 52 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 53 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 141 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 143 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.877

MX W479 147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 151 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 215 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 216 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 221 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 222 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.588

MX W479 244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 291 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.544

MX W479 296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 308 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.572

MX W479 312 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 313 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.700

MX W479 314 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 317 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.795

MX W479 318 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 320 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 321 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 340 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 342 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 475 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.580

MX W479 479 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 482 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.746

MX W479 483 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 484 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 486 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 487 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.681

MX W479 488 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.697

MX W479 489 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.921

MX W479 509 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 524 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 526 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 527 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 528 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.926

MX W479 529 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.676

MX W479 530 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.808

MX W479 531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.740

MX W479 532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.537

MX W479 533 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.621

MX W479 534 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.830

MX W479 535 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 554 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 555 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 556 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 573 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.536

MX W479 574 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.241

MX W479 575 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 576 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.562

MX W479 577 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 578 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.213

MX W479 579 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 580 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 581 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.713

MX W479 582 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.678

MX W479 583 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.869

MX W479 584 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 595 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 597 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.667

MX W479 599 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.596

MX W479 600 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 601 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.705

MX W479 605 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.665

MX W479 632 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 725 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 727 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 775 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 822 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 837 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 838 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 839 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 932 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 1029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 1031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479 1034 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 1035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 1051 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 1052 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 1053 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.884

MX W479 1054 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.859

MX W479 1055 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.766

MX W479 1056 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.677

MX W479 1060 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479	1061	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.639
MX W479	1197	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	1198	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.709
MX W479	1199	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	1200	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.530
MX W479	1201	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.663
MX W479	1202	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.650
MX W479	1203	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.590
MX W479	1204	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.726
MX W479	1205	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.750
MX W479	1206	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.700
MX W479	1208	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	1218	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	1219	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.824
MX W479	1220	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	1221	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.731
MX W479	1222	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	1223	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	1224	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	1225	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	1226	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753
MX W479	1227	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	1228	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	1229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602
MX W479	1230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	1231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753
MX W479	1243	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	1244	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	1245	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522

MX W479 1276 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 1277 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 1278 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.729

MX W479 1293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 1294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.851

MX W479 1295 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 1296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 1297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 1300 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 1301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.723

MX W479 1302 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 1303 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 1316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.692

MX W479 1343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 1344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.720

MX W479 1345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 1346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 1347 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.663

MX W479 1348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 1363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 1365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.696

MX W479 1373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 1374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1375 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.622

MX W479 1392 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 1394 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.577

MX W479 1395 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479	1396	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.671
MX W479	1397	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	1441	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	1442	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	1483	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.647
MX W479	1532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	1537	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	1539	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.613
MX W479	1540	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	1541	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.648
MX W479	1543	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614
MX W479	1566	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.569
MX W479	1661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.575
MX W479	1989	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	1990	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	1991	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	1993	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.563
MX W479	1994	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.534
MX W479	2086	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	2088	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	2089	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	2093	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	2228	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.579
MX W479	2229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	2230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.693
MX W479	2231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.634
MX W479	2232	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.632
MX W479	2234	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	2235	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.736

MX W479 2253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 2254 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 2255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.755

MX W479 2262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 2348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 2349 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2350 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 2351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2352 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.834

MX W479 2353 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 2354 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2355 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.560

MX W479 2356 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 2373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.752

MX W479 2374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 2378 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 2379 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 2380 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 2382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 2399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.920

MX W479 2421 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2422 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 2424 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 2425 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 2428 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 2429 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 2430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 2445 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479	2447	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.779
MX W479	2448	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.743
MX W479	2449	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.733
MX W479	2450	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	2468	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.568
MX W479	2469	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.019
MX W479	2470	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.976
MX W479	2471	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.882
MX W479	2472	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.650
MX W479	2542	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.620
MX W479	2543	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.826
MX W479	2544	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.734
MX W479	2545	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.629
MX W479	2546	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.769
MX W479	2547	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.656
MX W479	2548	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.679
MX W479	2549	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.853
MX W479	2550	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	2615	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	2616	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	2617	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614
MX W479	2639	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	2640	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	2641	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.777
MX W479	2643	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.648
MX W479	2645	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602
MX W479	2646	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	2660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	2663	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.896

MX W479	2664	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	2666	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	2669	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	2670	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.500
MX W479	2763	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.504
MX W479	2783	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.567
MX W479	2786	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.588
MX W479	2788	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.748
MX W479	2789	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	2832	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.501
MX W479	2833	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.506
MX W479	2900	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	2901	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.673
MX W479	2902	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.730
MX W479	2903	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	2905	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	2906	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753
MX W479	2907	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	3045	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.549
MX W479	3047	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.554
MX W479	3048	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	3148	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	3149	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	3168	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	3169	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	3170	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.601
MX W479	3171	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.796
MX W479	3172	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	3173	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.889

MX W479	3174	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	3239	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	3262	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.633
MX W479	3263	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	3289	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.546
MX W479	3290	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.586
MX W479	3291	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.607
MX W479	3293	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	3294	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	3313	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	3316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.595
MX W479	3337	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	3338	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.521
MX W479	3339	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	3363	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.584
MX W479	3364	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	3365	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	3366	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.576
MX W479	3382	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.620
MX W479	3383	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.727
MX W479	3384	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.606
MX W479	3453	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.648
MX W479	3454	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.711
MX W479	3457	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	3509	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.654
MX W479	3525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614
MX W479	3671	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.541
MX W479	3674	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	3693	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520

MX W479	3748	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.562
MX W479	3792	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.536
MX W479	3796	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.568
MX W479	4029	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.848
MX W479	4030	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.707
MX W479	4031	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	4035	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	4036	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	4037	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	4057	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.502
MX W479	4080	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	4101	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.545
MX W479	4102	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	4103	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.847
MX W479	4104	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.608
MX W479	4105	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	4172	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.682
MX W479	4173	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.824
MX W479	4227	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	4297	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	4298	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.590
MX W479	4301	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.582
MX W479	4493	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.603
MX W479	4586	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	4629	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.548
MX W479	4630	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.517
MX W479	4652	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.510
MX W479	4653	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.685
MX W479	4654	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556

MX W479	4656	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	4657	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.903
MX W479	4658	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.975
MX W479	4659	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.826
MX W479	4660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.741
MX W479	4661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.888
MX W479	4677	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.524
MX W479	4679	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	4680	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	4685	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.731
MX W479	4724	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	4996	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	5331	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.662
MX W479	5332	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561
MX W479	5471	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	5472	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	5475	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	5614	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.669
MX W479	5615	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.549
MX W479	5621	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.557
MX W479	5622	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.623
MX W479	5790	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.581
MX W479	5804	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	5805	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	5809	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	5812	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.675
MX W479	5813	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	5814	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	5979	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531

MX W479	5980	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.546
MX W479	6120	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	6121	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.501
MX W479	6125	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	6126	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	6142	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	6146	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.582
MX W479	6147	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.573
MX W479	6148	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.779
MX W479	6149	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.883
MX W479	6150	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.860
MX W479	6267	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.540
MX W479	6268	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	6271	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.529
MX W479	6286	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.595
MX W479	6292	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.577
MX W479	6294	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.615
MX W479	6405	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.611
MX W479	6406	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.887
MX W479	6407	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	6408	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.541
MX W479	6409	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	6410	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.740
MX W479	6411	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	6413	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	6430	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.587
MX W479	6431	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	6435	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.023
MX W479	6436	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778

MX W479 6486 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 6501 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.822

MX W479 6524 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 6525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.600

MX W479 6526 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.566

MX W479 6528 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.612

MX W479 6529 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.627

MX W479 6530 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 6531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.662

MX W479 6532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.680

MX W479 6548 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.718

MX W479 6549 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.739

MX W479 6550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.767

MX W479 6553 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 6554 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.776

MX W479 6555 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 6556 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 6558 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.988

MX W479 6559 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.766

MX W479 6571 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.523

MX W479 6572 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.870

MX W479 6573 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.668

MX W479 6574 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.705

MX W479 6577 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.791

MX W479 6578 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 6579 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.622

MX W479 6580 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 6581 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.872

MX W479 6582 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.704

MX W479	6583	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	6596	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	6602	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	6791	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.545
MX W479	6835	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.564
MX W479	6836	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	6868	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	6870	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.516
MX W479	6890	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	6912	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.576
MX W479	6913	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	6914	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	6915	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	6917	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	6918	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	7014	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7099	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.534
MX W479	7100	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.759
MX W479	7101	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7103	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	7111	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	7123	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	7126	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.603
MX W479	7127	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	7129	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	7130	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.683
MX W479	7131	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	7132	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.525
MX W479	7195	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.554

MX W479	7196	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	7199	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	7207	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	7220	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.644
MX W479	7243	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.628
MX W479	7244	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.575
MX W479	7246	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.712
MX W479	7252	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.629
MX W479	7253	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	7255	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.681
MX W479	7316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.757
MX W479	7317	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.558
MX W479	7318	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.570
MX W479	7319	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	7321	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602
MX W479	7323	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	7324	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.578
MX W479	7326	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	7340	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.691
MX W479	7343	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.510
MX W479	7345	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	7346	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	7351	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	7363	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	7364	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.215
MX W479	7366	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.516
MX W479	7367	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.612
MX W479	7368	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.799
MX W479	7369	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.518

MX W479	7388	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	7389	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	7390	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.725
MX W479	7391	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.797
MX W479	7393	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7395	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	7396	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	7397	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	7399	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.656
MX W479	7400	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.686
MX W479	7446	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.641
MX W479	7462	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.761
MX W479	7468	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	7469	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.811
MX W479	7470	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.856
MX W479	7471	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.803
MX W479	7484	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.540
MX W479	7513	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.558
MX W479	7514	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.585
MX W479	7531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.594
MX W479	7543	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	7585	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.532
MX W479	7586	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.831
MX W479	7587	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.573
MX W479	7602	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.586
MX W479	7603	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561
MX W479	7660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.708
MX W479	7661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7681	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574

MX W479	7682	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7683	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.707
MX W479	7684	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.628
MX W479	7753	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.641
MX W479	7755	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.502
MX W479	7794	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.607
MX W479	7796	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.032
MX W479	7797	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.212
MX W479	7798	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.800
MX W479	7801	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.637
MX W479	7802	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.906
MX W479	7803	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	7804	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	7805	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.048
MX W479	7806	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.021
MX W479	7807	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.755
MX W479	7819	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.902
MX W479	7867	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	7869	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	7873	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	7878	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	7879	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	7891	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	7892	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.532
MX W479	7894	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	7896	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	7897	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.506
MX W479	7898	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.761
MX W479	7899	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.773

MX W479	7900	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	7901	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.852
MX W479	7941	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	7948	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7989	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.671
MX W479	7990	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	7991	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	7992	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.622
MX W479	7993	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.288
MX W479	7994	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.608
MX W479	7996	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.606
MX W479	8011	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	8041	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.505
MX W479	8042	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	8062	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	8067	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	8086	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.668
MX W479	8087	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.504
MX W479	8088	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.618
MX W479	8089	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	8090	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.585
MX W479	8091	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	8107	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.613
MX W479	8108	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	8111	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.564
MX W479	8112	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.633
MX W479	8116	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	8117	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.838
MX W479	8118	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.725

MX W479 8119 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.001

MX W479 8120 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.649

MX W479 8190 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 8191 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 8192 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 8202 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.572

MX W479 8203 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.563

MX W479 8204 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.511

MX W479 8206 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 8208 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.642

MX W479 8209 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.717

MX W479 8210 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.670

MX W479 8211 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 8213 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.701

MX W479 8214 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.584

MX W479 8215 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.714

MX W479 8216 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.687

MX W479 8229 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 8230 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 8231 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 8235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 8238 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 8301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.642

MX W479 8304 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 8306 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.685

MX W479 8307 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 8311 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.550

MX W479 8350 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.596

MX W479 8356 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.511

MX W479	8358	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	8360	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	8427	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.593
MX W479	8428	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.548
MX W479	8442	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	8445	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	8447	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	8448	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	8450	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	8451	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.695
MX W479	8452	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.533
MX W479	8514	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	8553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.944
MX W479	8567	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.619
MX W479	8570	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.535
MX W479	8571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	8595	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626
MX W479	8646	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	8660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.567
MX W479	8730	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	8734	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	8735	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.560
MX W479	8760	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** MODEL SETUP OPTIONS SUMMARY ***

** Model Options Selected:

* Model Uses Regulatory DEFAULT Options
* Model Is Setup For Calculation of Average CONCentration Values.
* NO GAS DEPOSITION Data Provided.
* NO PARTICLE DEPOSITION Data Provided.
* Model Uses NO DRY DEPLETION. DDPLETE = F
* Model Uses NO WET DEPLETION. WETDPLT = F
* Stack-tip Downwash.
* Model Accounts for ELEVated Terrain Effects.
* Use Calms Processing Routine.
* Use Missing Data Processing Routine.
* No Exponential Decay.
* Model Uses RURAL Dispersion Only.
* BULKRN - Use BULKRN Delta-T and SolarRad option for SBL in AERMET
* Model Assumes No FLAGPOLE Receptor Heights.
* The User Specified a Pollutant Type of: PARTMATT

**Model Calculates 1 Short Term Average(s) of: 24-HR
and Calculates ANNUAL Averages

**This Run Includes: 1 Source(s); 1 Source Group(s); and 3106 Receptor(s)

with: 1 POINT(s), including

0 POINTCAP(s) and 0 POINTHOR(s)

and: 0 VOLUME source(s)

and: 0 AREA type source(s)

and: 0 LINE source(s)

and: 0 RLINE/RLINEXT source(s)

and: 0 OPENPIT source(s)

and: 0 BUOYANT LINE source(s) with a total of 0 line(s)

and: 0 SWPOINT source(s)

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 22112

**Output Options Selected:

Model Outputs Tables of ANNUAL Averages by Receptor

Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours

m for Missing Hours

b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1730.68 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0

Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07

Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 3.9 MB of RAM.

**Input Runstream File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**Output Print File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**File for Summary of Results: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***

(1=YES; 0=NO)

1 1 1

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***

(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:15:40

PAGE 3

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling
Met Version: 22112

Profile file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling

Surface format: FREE

Profile format: FREE

Surface station no.: 0 Upper air station no.: 23062

Name: UNKNOWN Name: DENVER WSFO, CO

Year: 2006 Year: 2006

First 24 hours of scalar data

YR MO DY JDY HR H0 U* W* DT/DZ ZICNV ZIMCH M-O LEN Z0 BOWEN ALBEDO REF WS WD HT REF TA HT

- -

06 01 01 1 01 -26.0 0.162 -9.000 -9.000 -999. 157. 11.8 0.01 1.89 1.00 4.43 326. 10.0 280.1 2.0

06 01 01 1 02 -58.1 0.325 -9.000 -9.000 -999. 445. 42.5 0.01 1.89 1.00 6.57 310. 10.0 281.4
2.0

06 01 01 1 03 -33.0 0.292 -9.000 -9.000 -999. 380. 54.5 0.01 1.89 1.00 5.72 272. 10.0 281.0
2.0

06 01 01 1 04 -14.9 0.128 -9.000 -9.000 -999. 134. 10.2 0.01 1.89 1.00 3.67 320. 10.0 279.8
2.0

06 01 01 1 05 -13.5 0.124 -9.000 -9.000 -999. 105. 10.1 0.01 1.89 1.00 3.71 337. 10.0 279.0
2.0

06 01 01 1 06 -18.3 0.176 -9.000 -9.000 -999. 177. 21.3 0.01 1.89 1.00 4.29 344. 10.0 278.3
2.0

06 01 01 1 07 -34.9 0.286 -9.000 -9.000 -999. 367. 48.1 0.01 1.89 1.00 5.68 327. 10.0 279.3
2.0

06 01 01 1 08 -39.7 0.440 -9.000 -9.000 -999. 701. 154.4 0.01 1.89 1.00 7.96 307. 10.0 279.8
2.0

06 01 01 1 09 -17.3 0.580 -9.000 -9.000 -999. 1058. 810.0 0.01 1.89 0.43 10.10 287. 10.0 279.4
2.0

06 01 01 1 10 38.3 0.682 0.602 0.005 164. 1349. -597.0 0.01 1.89 0.31 11.67 301. 10.0 280.9
2.0

06 01 01 1 11 83.4 0.893 1.120 0.005 486. 2020. -616.6 0.01 1.89 0.26 15.29 291. 10.0 281.4
2.0

06 01 01 1 12 97.2 0.889 1.326 0.005 693. 2013. -521.8 0.01 1.89 0.24 15.20 293. 10.0 281.3
2.0

06 01 01 1 13 137.5 0.968 1.629 0.005 909. 2279. -476.9 0.01 1.89 0.24 16.54 291. 10.0
281.3 2.0

06 01 01 1 14 122.9 0.912 1.653 0.005 1063. 2100. -445.7 0.01 1.89 0.25 15.56 290. 10.0
281.0 2.0

06 01 01 1 15 67.7 0.795 1.385 0.005 1138. 1727. -536.6 0.01 1.89 0.30 13.59 295. 10.0
280.1 2.0

06 01 01 1 16 0.0 0.715 -9.000 -9.000 -999. 1464. 8888.0 0.01 1.89 0.41 12.34 301. 10.0 279.0
2.0

06 01 01 1 17 0.0 0.673 -9.000 -9.000 -999. 1330. 8888.0 0.01 1.89 0.72 11.62 304. 10.0 277.1
2.0

06 01 01 1 18 0.0 0.546 -9.000 -9.000 -999. 987. 8888.0 0.01 1.89 1.00 9.43 293. 10.0 275.9
2.0

06 01 01 1 19 -46.9 0.630 -9.000 -9.000 -999. 1199. 388.5 0.01 1.89 1.00 11.09 294. 10.0 276.2
2.0

06 01 01 1 20 -49.7 0.337 -9.000 -9.000 -999. 566. 55.9 0.01 1.89 1.00 6.57 310. 10.0 275.6
2.0

06 01 01 1 21 -29.5 0.194 -9.000 -9.000 -999. 235. 17.9 0.01 1.89 1.00 4.69 313. 10.0 274.4
2.0

06 01 01 1 22 -29.9 0.238 -9.000 -9.000 -999. 279. 32.8 0.01 1.89 1.00 5.32 338. 10.0 275.8
2.0

06 01 01 1 23 -15.8 0.134 -9.000 -9.000 -999. 123. 11.1 0.01 1.89 1.00 3.67 241. 10.0 274.5
2.0

06 01 01 1 24 -19.1 0.117 -9.000 -9.000 -999. 96. 6.1 0.01 1.89 1.00 3.98 279. 10.0 273.6
2.0

First hour of profile data

YR MO DY HR HEIGHT F WDIR WSPD AMB_TMP sigmaA sigmaW sigmaV

06 01 01 01 2.0 0 -999. -99.00 280.1 99.0 -99.00 -99.00

06 01 01 01 10.0 0 326. 4.43 282.0 5.4 -99.00 0.42

06 01 01 01 60.0 1 316. 5.10 283.1 6.1 -99.00 0.54

F indicates top of profile (=1) or below (=0)

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:15:40

PAGE 4

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF PARTMATT IN MICROGRAMS/M**3 **

NETWORK

GROUP ID AVERAGE CONC RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

ALL 1ST HIGHEST VALUE IS 0.00250 AT (499450.00, 4508500.00, 1603.57, 1603.57, 0.00) DC

2ND HIGHEST VALUE IS 0.00244 AT (499450.00, 4508450.00, 1603.33, 1603.33, 0.00) DC

3RD HIGHEST VALUE IS 0.00242 AT (499700.00, 4508150.00, 1610.72, 1610.72, 0.00) DC

4TH HIGHEST VALUE IS 0.00238 AT (499450.00, 4508550.00, 1603.86, 1603.86, 0.00) DC

5TH HIGHEST VALUE IS 0.00235 AT (499750.00, 4508100.00, 1608.86, 1608.86, 0.00) DC

6TH HIGHEST VALUE IS 0.00232 AT (499750.00, 4508150.00, 1610.15, 1610.15, 0.00) DC

7TH HIGHEST VALUE IS 0.00231 AT (499700.00, 4508100.00, 1609.85, 1609.85, 0.00) DC

8TH HIGHEST VALUE IS 0.00230 AT (499400.00, 4508500.00, 1603.34, 1603.34, 0.00) DC

9TH HIGHEST VALUE IS 0.00229 AT (499800.00, 4508100.00, 1606.47, 1606.47, 0.00) DC

10TH HIGHEST VALUE IS 0.00225 AT (499400.00, 4508550.00, 1603.60, 1603.60, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PARTMATT IN MICROGRAMS/M**3 **

DATE NETWORK

GROUP ID AVERAGE CONC (YYMMDDHH) RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

- -

ALL HIGH 1ST HIGH VALUE IS 0.04249 ON 06092324: AT (499650.00, 4508050.00, 1606.22, 1606.22, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:15:40

PAGE 6

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)

A Total of 624 Warning Message(s)

A Total of 142 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 1 Calm Hours Identified

A Total of 141 Missing Hours Identified (1.61 Percent)

******** FATAL ERROR MESSAGES ********

*** NONE ***

******** WARNING MESSAGES ********

ME W181 3169 MEOPEN: BULKRN Delta-T & SolarRad option for SBL was used in AERMET

MX W403 3169 PFLCNV: Turbulence data is being used w/o ADJ_U* option SigA Data

MX W479 24 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 29 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 30 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 31 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 48 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 51 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 52 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 53 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 141 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 143 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.877

MX W479 147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 151 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 215 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 216 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 221 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 222 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.588

MX W479 244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 291 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.544

MX W479 296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 308 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.572

MX W479 312 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 313 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.700

MX W479 314 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 317 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.795

MX W479 318 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 320 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 321 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 340 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 342 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 475 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.580

MX W479 479 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 482 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.746

MX W479 483 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 484 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 486 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 487 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.681

MX W479 488 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.697

MX W479 489 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.921

MX W479 509 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 524 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 526 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 527 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 528 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.926

MX W479 529 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.676

MX W479 530 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.808

MX W479 531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.740

MX W479 532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.537

MX W479 533 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.621

MX W479 534 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.830

MX W479 535 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 554 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 555 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 556 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 573 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.536

MX W479 574 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.241

MX W479 575 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 576 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.562

MX W479 577 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 578 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.213

MX W479 579 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 580 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 581 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.713

MX W479 582 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.678

MX W479 583 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.869

MX W479 584 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 595 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 597 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.667

MX W479 599 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.596

MX W479 600 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 601 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.705

MX W479 605 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.665

MX W479 632 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 725 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 727 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 775 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 822 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 837 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 838 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 839 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 932 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 1029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 1031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479 1034 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 1035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 1051 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 1052 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 1053 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.884

MX W479 1054 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.859

MX W479	1055	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.766
MX W479	1056	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.677
MX W479	1060	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	1061	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.639
MX W479	1197	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	1198	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.709
MX W479	1199	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	1200	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.530
MX W479	1201	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.663
MX W479	1202	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.650
MX W479	1203	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.590
MX W479	1204	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.726
MX W479	1205	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.750
MX W479	1206	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.700
MX W479	1208	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	1218	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	1219	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.824
MX W479	1220	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	1221	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.731
MX W479	1222	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	1223	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	1224	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	1225	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	1226	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753
MX W479	1227	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	1228	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	1229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602
MX W479	1230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	1231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753

MX W479 1243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 1244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 1245 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 1276 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 1277 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 1278 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.729

MX W479 1293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 1294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.851

MX W479 1295 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 1296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 1297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 1300 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 1301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.723

MX W479 1302 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 1303 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 1316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.692

MX W479 1343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 1344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.720

MX W479 1345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 1346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 1347 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.663

MX W479 1348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 1363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 1365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.696

MX W479 1373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 1374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1375 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.622

MX W479	1392	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	1394	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.577
MX W479	1395	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	1396	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.671
MX W479	1397	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	1441	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	1442	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	1483	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.647
MX W479	1532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	1537	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	1539	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.613
MX W479	1540	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	1541	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.648
MX W479	1543	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614
MX W479	1566	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.569
MX W479	1661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.575
MX W479	1989	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	1990	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	1991	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	1993	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.563
MX W479	1994	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.534
MX W479	2086	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	2088	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	2089	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	2093	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	2228	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.579
MX W479	2229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	2230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.693
MX W479	2231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.634

MX W479 2232 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.632

MX W479 2234 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 2235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 2253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 2254 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 2255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.755

MX W479 2262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 2348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 2349 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2350 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 2351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2352 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.834

MX W479 2353 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 2354 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2355 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.560

MX W479 2356 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 2373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.752

MX W479 2374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 2378 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 2379 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 2380 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 2382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 2399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.920

MX W479 2421 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2422 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 2424 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 2425 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 2428 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 2429 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 2430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 2445 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2447 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.779

MX W479 2448 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 2449 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.733

MX W479 2450 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 2468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.019

MX W479 2470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.976

MX W479 2471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.882

MX W479 2472 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.650

MX W479 2542 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.826

MX W479 2544 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 2545 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.629

MX W479 2546 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.769

MX W479 2547 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.656

MX W479 2548 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.679

MX W479 2549 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.853

MX W479 2550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2615 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 2616 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 2617 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2639 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 2640 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2641 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.777

MX W479 2643 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 2645 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 2646 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 2663 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.896

MX W479 2664 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 2666 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 2669 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 2670 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 2763 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.504

MX W479 2783 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.567

MX W479 2786 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.588

MX W479 2788 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2789 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2832 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 2833 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.506

MX W479 2900 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 2901 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.673

MX W479 2902 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.730

MX W479 2903 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 2905 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.672

MX W479 2906 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.753

MX W479 2907 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 3045 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 3047 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.554

MX W479 3048 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 3148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 3149 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 3168 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 3169 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 3170 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.601

MX W479	3171	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.796
MX W479	3172	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	3173	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.889
MX W479	3174	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	3239	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	3262	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.633
MX W479	3263	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	3289	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.546
MX W479	3290	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.586
MX W479	3291	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.607
MX W479	3293	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	3294	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	3313	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	3316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.595
MX W479	3337	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	3338	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.521
MX W479	3339	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	3363	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.584
MX W479	3364	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	3365	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	3366	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.576
MX W479	3382	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.620
MX W479	3383	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.727
MX W479	3384	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.606
MX W479	3453	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.648
MX W479	3454	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.711
MX W479	3457	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	3509	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.654
MX W479	3525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614

MX W479	3671	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.541
MX W479	3674	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	3693	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	3748	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.562
MX W479	3792	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.536
MX W479	3796	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.568
MX W479	4029	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.848
MX W479	4030	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.707
MX W479	4031	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	4035	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	4036	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	4037	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	4057	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.502
MX W479	4080	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	4101	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.545
MX W479	4102	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	4103	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.847
MX W479	4104	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.608
MX W479	4105	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	4172	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.682
MX W479	4173	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.824
MX W479	4227	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	4297	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	4298	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.590
MX W479	4301	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.582
MX W479	4493	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.603
MX W479	4586	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	4629	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.548
MX W479	4630	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.517

MX W479	4652	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.510
MX W479	4653	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.685
MX W479	4654	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	4656	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	4657	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.903
MX W479	4658	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.975
MX W479	4659	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.826
MX W479	4660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.741
MX W479	4661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.888
MX W479	4677	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.524
MX W479	4679	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	4680	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	4685	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.731
MX W479	4724	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	4996	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	5331	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.662
MX W479	5332	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561
MX W479	5471	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	5472	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	5475	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	5614	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.669
MX W479	5615	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.549
MX W479	5621	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.557
MX W479	5622	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.623
MX W479	5790	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.581
MX W479	5804	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	5805	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	5809	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	5812	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.675

MX W479 5813 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.645

MX W479 5814 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.523

MX W479 5979 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 5980 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 6120 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 6121 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 6125 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 6126 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 6142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 6146 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 6147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.573

MX W479 6148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.779

MX W479 6149 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.883

MX W479 6150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.860

MX W479 6267 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 6268 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 6271 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 6286 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 6292 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.577

MX W479 6294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.615

MX W479 6405 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 6406 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.887

MX W479 6407 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 6408 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.541

MX W479 6409 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 6410 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.740

MX W479 6411 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 6413 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 6430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479	6431	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	6435	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.023
MX W479	6436	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	6486	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	6501	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.822
MX W479	6524	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.557
MX W479	6525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.600
MX W479	6526	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	6528	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.612
MX W479	6529	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	6530	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	6531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.662
MX W479	6532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.680
MX W479	6548	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.718
MX W479	6549	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.739
MX W479	6550	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.767
MX W479	6553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.592
MX W479	6554	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.776
MX W479	6555	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.581
MX W479	6556	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	6558	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.988
MX W479	6559	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.766
MX W479	6571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	6572	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.870
MX W479	6573	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.668
MX W479	6574	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.705
MX W479	6577	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.791
MX W479	6578	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	6579	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.622

MX W479	6580	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	6581	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.872
MX W479	6582	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.704
MX W479	6583	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	6596	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	6602	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	6791	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.545
MX W479	6835	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.564
MX W479	6836	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	6868	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	6870	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.516
MX W479	6890	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	6912	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.576
MX W479	6913	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	6914	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	6915	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	6917	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	6918	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	7014	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7099	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.534
MX W479	7100	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.759
MX W479	7101	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7103	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	7111	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	7123	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	7126	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.603
MX W479	7127	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	7129	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	7130	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.683

MX W479	7131	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	7132	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.525
MX W479	7195	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.554
MX W479	7196	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	7199	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	7207	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	7220	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.644
MX W479	7243	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.628
MX W479	7244	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.575
MX W479	7246	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.712
MX W479	7252	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.629
MX W479	7253	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	7255	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.681
MX W479	7316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.757
MX W479	7317	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.558
MX W479	7318	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.570
MX W479	7319	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	7321	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602
MX W479	7323	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	7324	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.578
MX W479	7326	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	7340	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.691
MX W479	7343	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.510
MX W479	7345	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	7346	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	7351	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	7363	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	7364	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.215
MX W479	7366	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.516

MX W479	7367	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.612
MX W479	7368	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.799
MX W479	7369	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.518
MX W479	7388	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	7389	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	7390	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.725
MX W479	7391	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.797
MX W479	7393	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7395	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	7396	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	7397	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	7399	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.656
MX W479	7400	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.686
MX W479	7446	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.641
MX W479	7462	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.761
MX W479	7468	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	7469	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.811
MX W479	7470	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.856
MX W479	7471	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.803
MX W479	7484	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.540
MX W479	7513	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.558
MX W479	7514	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.585
MX W479	7531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.594
MX W479	7543	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	7585	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.532
MX W479	7586	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.831
MX W479	7587	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.573
MX W479	7602	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.586
MX W479	7603	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561

MX W479	7660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.708
MX W479	7661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7681	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	7682	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7683	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.707
MX W479	7684	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.628
MX W479	7753	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.641
MX W479	7755	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.502
MX W479	7794	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.607
MX W479	7796	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.032
MX W479	7797	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.212
MX W479	7798	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.800
MX W479	7801	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.637
MX W479	7802	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.906
MX W479	7803	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	7804	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	7805	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.048
MX W479	7806	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.021
MX W479	7807	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.755
MX W479	7819	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.902
MX W479	7867	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	7869	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	7873	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	7878	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	7879	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	7891	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	7892	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.532
MX W479	7894	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	7896	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556

MX W479	7897	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.506
MX W479	7898	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.761
MX W479	7899	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.773
MX W479	7900	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	7901	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.852
MX W479	7941	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	7948	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7989	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.671
MX W479	7990	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	7991	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	7992	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.622
MX W479	7993	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.288
MX W479	7994	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.608
MX W479	7996	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.606
MX W479	8011	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	8041	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.505
MX W479	8042	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	8062	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	8067	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	8086	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.668
MX W479	8087	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.504
MX W479	8088	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.618
MX W479	8089	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	8090	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.585
MX W479	8091	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	8107	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.613
MX W479	8108	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	8111	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.564
MX W479	8112	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.633

MX W479 8116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 8117 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.838

MX W479 8118 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 8119 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.001

MX W479 8120 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.649

MX W479 8190 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 8191 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 8192 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 8202 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.572

MX W479 8203 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.563

MX W479 8204 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.511

MX W479 8206 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 8208 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.642

MX W479 8209 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.717

MX W479 8210 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.670

MX W479 8211 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 8213 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.701

MX W479 8214 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.584

MX W479 8215 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.714

MX W479 8216 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.687

MX W479 8229 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 8230 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 8231 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 8235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 8238 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 8301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.642

MX W479 8304 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 8306 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.685

MX W479 8307 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 8311 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.550

MX W479 8350 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.596

MX W479 8356 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.511

MX W479 8358 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 8360 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 8427 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.593

MX W479 8428 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.548

MX W479 8442 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.566

MX W479 8445 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 8447 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 8448 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.591

MX W479 8450 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.583

MX W479 8451 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.695

MX W479 8452 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.533

MX W479 8514 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 8553 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.944

MX W479 8567 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.619

MX W479 8570 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 8571 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.544

MX W479 8595 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.626

MX W479 8646 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 8660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.567

MX W479 8730 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 8734 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.672

MX W479 8735 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.560

MX W479 8760 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.626

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** MODEL SETUP OPTIONS SUMMARY ***

** Model Options Selected:

* Model Uses Regulatory DEFAULT Options
* Model Is Setup For Calculation of Average CONCentration Values.
* NO GAS DEPOSITION Data Provided.
* NO PARTICLE DEPOSITION Data Provided.
* Model Uses NO DRY DEPLETION. DDPLETE = F
* Model Uses NO WET DEPLETION. WETDPLT = F
* Stack-tip Downwash.
* Model Accounts for ELEVated Terrain Effects.
* Use Calms Processing Routine.
* Use Missing Data Processing Routine.
* No Exponential Decay.
* Model Uses RURAL Dispersion Only.
* BULKRN - Use BULKRN Delta-T and SolarRad option for SBL in AERMET
* Model Assumes No FLAGPOLE Receptor Heights.
* The User Specified a Pollutant Type of: SULFURDI

**Model Calculates 1 Short Term Average(s) of: 1-HR

**This Run Includes: 1 Source(s); 1 Source Group(s); and 3106 Receptor(s)

with: 1 POINT(s), including

0 POINTCAP(s) and 0 POINTHOR(s)

and: 0 VOLUME source(s)

and: 0 AREA type source(s)

and: 0 LINE source(s)

and: 0 RLINE/RLINEXT source(s)

and: 0 OPENPIT source(s)

and: 0 BUOYANT LINE source(s) with a total of 0 line(s)

and: 0 SWPOINT source(s)

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 22112

**Output Options Selected:

Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours

m for Missing Hours

b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1730.68 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0

Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07

Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 3.9 MB of RAM.

**Input Runstream File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**Output Print File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**File for Summary of Results: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***

(1=YES; 0=NO)

1 1 1

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***

(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling
Met Version: 22112

Profile file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling

Surface format: FREE

Profile format: FREE

Surface station no.: 0 Upper air station no.: 23062

Name: UNKNOWN Name: DENVER WSFO, CO

Year: 2006 Year: 2006

First 24 hours of scalar data

YR MO DY JDY HR H0 U* W* DT/DZ ZICNV ZIMCH M-O LEN Z0 BOWEN ALBEDO REF WS WD HT REF TA HT

- -

06 01 01 1 01 -26.0 0.162 -9.000 -9.000 -999. 157. 11.8 0.01 1.89 1.00 4.43 326. 10.0 280.1 2.0

06 01 01 1 02 -58.1 0.325 -9.000 -9.000 -999. 445. 42.5 0.01 1.89 1.00 6.57 310. 10.0 281.4 2.0

06 01 01 1 03 -33.0 0.292 -9.000 -9.000 -999. 380. 54.5 0.01 1.89 1.00 5.72 272. 10.0 281.0
2.0

06 01 01 1 04 -14.9 0.128 -9.000 -9.000 -999. 134. 10.2 0.01 1.89 1.00 3.67 320. 10.0 279.8
2.0

06 01 01 1 05 -13.5 0.124 -9.000 -9.000 -999. 105. 10.1 0.01 1.89 1.00 3.71 337. 10.0 279.0
2.0

06 01 01 1 06 -18.3 0.176 -9.000 -9.000 -999. 177. 21.3 0.01 1.89 1.00 4.29 344. 10.0 278.3
2.0

06 01 01 1 07 -34.9 0.286 -9.000 -9.000 -999. 367. 48.1 0.01 1.89 1.00 5.68 327. 10.0 279.3
2.0

06 01 01 1 08 -39.7 0.440 -9.000 -9.000 -999. 701. 154.4 0.01 1.89 1.00 7.96 307. 10.0 279.8
2.0

06 01 01 1 09 -17.3 0.580 -9.000 -9.000 -999. 1058. 810.0 0.01 1.89 0.43 10.10 287. 10.0 279.4
2.0

06 01 01 1 10 38.3 0.682 0.602 0.005 164. 1349. -597.0 0.01 1.89 0.31 11.67 301. 10.0 280.9
2.0

06 01 01 1 11 83.4 0.893 1.120 0.005 486. 2020. -616.6 0.01 1.89 0.26 15.29 291. 10.0 281.4
2.0

06 01 01 1 12 97.2 0.889 1.326 0.005 693. 2013. -521.8 0.01 1.89 0.24 15.20 293. 10.0 281.3
2.0

06 01 01 1 13 137.5 0.968 1.629 0.005 909. 2279. -476.9 0.01 1.89 0.24 16.54 291. 10.0
281.3 2.0

06 01 01 1 14 122.9 0.912 1.653 0.005 1063. 2100. -445.7 0.01 1.89 0.25 15.56 290. 10.0
281.0 2.0

06 01 01 1 15 67.7 0.795 1.385 0.005 1138. 1727. -536.6 0.01 1.89 0.30 13.59 295. 10.0
280.1 2.0

06 01 01 1 16 0.0 0.715 -9.000 -9.000 -999. 1464. 8888.0 0.01 1.89 0.41 12.34 301. 10.0 279.0
2.0

06 01 01 1 17 0.0 0.673 -9.000 -9.000 -999. 1330. 8888.0 0.01 1.89 0.72 11.62 304. 10.0 277.1
2.0

06 01 01 1 18 0.0 0.546 -9.000 -9.000 -999. 987. 8888.0 0.01 1.89 1.00 9.43 293. 10.0 275.9
2.0

06 01 01 1 19 -46.9 0.630 -9.000 -9.000 -999. 1199. 388.5 0.01 1.89 1.00 11.09 294. 10.0 276.2
2.0

06 01 01 1 20 -49.7 0.337 -9.000 -9.000 -999. 566. 55.9 0.01 1.89 1.00 6.57 310. 10.0 275.6 2.0

06 01 01 1 21 -29.5 0.194 -9.000 -9.000 -999. 235. 17.9 0.01 1.89 1.00 4.69 313. 10.0 274.4 2.0

06 01 01 1 22 -29.9 0.238 -9.000 -9.000 -999. 279. 32.8 0.01 1.89 1.00 5.32 338. 10.0 275.8 2.0

06 01 01 1 23 -15.8 0.134 -9.000 -9.000 -999. 123. 11.1 0.01 1.89 1.00 3.67 241. 10.0 274.5 2.0

06 01 01 1 24 -19.1 0.117 -9.000 -9.000 -999. 96. 6.1 0.01 1.89 1.00 3.98 279. 10.0 273.6 2.0

First hour of profile data

YR MO DY HR HEIGHT F WDIR WSPD AMB_TMP sigmaA sigmaW sigmaV

06 01 01 01 2.0 0 -999. -99.00 280.1 99.0 -99.00 -99.00

06 01 01 01 10.0 0 326. 4.43 282.0 5.4 -99.00 0.42

06 01 01 01 60.0 1 316. 5.10 283.1 6.1 -99.00 0.54

F indicates top of profile (=1) or below (=0)

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:16:59

PAGE 4

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF SULFURDI IN MICROGRAMS/M**3 **

DATE NETWORK

GROUP ID AVERAGE CONC (YYMMDDHH) RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

- -

ALL HIGH 1ST HIGH VALUE IS 7.47378 ON 06102824: AT (499600.00, 4508200.00, 1608.71, 1608.71, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)

A Total of 624 Warning Message(s)

A Total of 142 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 1 Calm Hours Identified

A Total of 141 Missing Hours Identified (1.61 Percent)

******** FATAL ERROR MESSAGES ********

*** NONE ***

******** WARNING MESSAGES ********

ME W181 3169 MEOPEN: BULKRN Delta-T & SolarRad option for SBL was used in AERMET

MX W403 3169 PFLCNV: Turbulence data is being used w/o ADJ_U* option SigA Data

MX W479 24 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 29 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 30 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 31 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 48 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 51 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 52 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 53 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 141 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 143 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.877

MX W479 147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 151 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 215 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 216 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 221 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 222 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.588

MX W479 244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 291 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.544

MX W479 296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 308 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.572

MX W479 312 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 313 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.700

MX W479 314 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 317 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.795

MX W479 318 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 320 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 321 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 340 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 342 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 475 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.580

MX W479 479 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 482 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.746

MX W479 483 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 484 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 486 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 487 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.681

MX W479 488 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.697

MX W479 489 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.921

MX W479 509 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 524 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 526 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 527 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 528 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.926

MX W479 529 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.676

MX W479 530 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.808

MX W479 531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.740

MX W479 532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.537

MX W479 533 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.621

MX W479 534 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.830

MX W479 535 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 554 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 555 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 556 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 573 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.536

MX W479 574 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.241

MX W479 575 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 576 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.562

MX W479 577 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 578 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.213

MX W479 579 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 580 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 581 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.713

MX W479 582 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.678

MX W479 583 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.869

MX W479 584 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 595 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 597 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.667

MX W479 599 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.596

MX W479 600 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 601 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.705

MX W479 605 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.665

MX W479 632 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 725 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 727 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 775 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 822 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 837 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 838 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 839 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 932 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 1029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 1031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479 1034 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 1035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 1051 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 1052 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 1053 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.884

MX W479 1054 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.859

MX W479 1055 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.766

MX W479 1056 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.677

MX W479 1060 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479	1061	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.639
MX W479	1197	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	1198	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.709
MX W479	1199	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	1200	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.530
MX W479	1201	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.663
MX W479	1202	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.650
MX W479	1203	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.590
MX W479	1204	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.726
MX W479	1205	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.750
MX W479	1206	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.700
MX W479	1208	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	1218	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	1219	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.824
MX W479	1220	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	1221	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.731
MX W479	1222	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	1223	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	1224	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	1225	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	1226	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753
MX W479	1227	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	1228	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	1229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602
MX W479	1230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	1231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753
MX W479	1243	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	1244	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	1245	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522

MX W479 1276 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 1277 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 1278 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.729

MX W479 1293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 1294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.851

MX W479 1295 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 1296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 1297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 1300 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 1301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.723

MX W479 1302 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 1303 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 1316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.692

MX W479 1343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 1344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.720

MX W479 1345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 1346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 1347 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.663

MX W479 1348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 1363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 1365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.696

MX W479 1373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 1374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1375 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.622

MX W479 1392 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 1394 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.577

MX W479 1395 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479	1396	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.671
MX W479	1397	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	1441	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	1442	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	1483	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.647
MX W479	1532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	1537	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	1539	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.613
MX W479	1540	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	1541	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.648
MX W479	1543	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614
MX W479	1566	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.569
MX W479	1661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.575
MX W479	1989	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	1990	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	1991	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	1993	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.563
MX W479	1994	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.534
MX W479	2086	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	2088	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	2089	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	2093	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	2228	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.579
MX W479	2229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	2230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.693
MX W479	2231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.634
MX W479	2232	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.632
MX W479	2234	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	2235	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.736

MX W479 2253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 2254 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 2255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.755

MX W479 2262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 2348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 2349 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2350 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 2351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2352 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.834

MX W479 2353 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 2354 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2355 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.560

MX W479 2356 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 2373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.752

MX W479 2374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 2378 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 2379 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 2380 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 2382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 2399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.920

MX W479 2421 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2422 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 2424 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 2425 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 2428 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 2429 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 2430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 2445 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2447 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.779

MX W479 2448 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 2449 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.733

MX W479 2450 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 2468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.019

MX W479 2470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.976

MX W479 2471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.882

MX W479 2472 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.650

MX W479 2542 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.826

MX W479 2544 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 2545 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.629

MX W479 2546 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.769

MX W479 2547 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.656

MX W479 2548 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.679

MX W479 2549 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.853

MX W479 2550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2615 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 2616 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 2617 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2639 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 2640 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2641 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.777

MX W479 2643 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 2645 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 2646 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 2663 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.896

MX W479	2664	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	2666	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	2669	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	2670	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.500
MX W479	2763	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.504
MX W479	2783	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.567
MX W479	2786	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.588
MX W479	2788	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.748
MX W479	2789	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	2832	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.501
MX W479	2833	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.506
MX W479	2900	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	2901	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.673
MX W479	2902	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.730
MX W479	2903	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	2905	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	2906	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753
MX W479	2907	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	3045	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.549
MX W479	3047	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.554
MX W479	3048	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	3148	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	3149	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	3168	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	3169	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	3170	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.601
MX W479	3171	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.796
MX W479	3172	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	3173	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.889

MX W479	3174	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	3239	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	3262	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.633
MX W479	3263	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	3289	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.546
MX W479	3290	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.586
MX W479	3291	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.607
MX W479	3293	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	3294	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	3313	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	3316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.595
MX W479	3337	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	3338	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.521
MX W479	3339	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	3363	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.584
MX W479	3364	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	3365	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	3366	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.576
MX W479	3382	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.620
MX W479	3383	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.727
MX W479	3384	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.606
MX W479	3453	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.648
MX W479	3454	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.711
MX W479	3457	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	3509	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.654
MX W479	3525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614
MX W479	3671	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.541
MX W479	3674	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	3693	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520

MX W479	3748	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.562
MX W479	3792	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.536
MX W479	3796	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.568
MX W479	4029	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.848
MX W479	4030	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.707
MX W479	4031	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	4035	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	4036	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	4037	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	4057	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.502
MX W479	4080	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	4101	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.545
MX W479	4102	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	4103	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.847
MX W479	4104	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.608
MX W479	4105	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	4172	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.682
MX W479	4173	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.824
MX W479	4227	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	4297	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	4298	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.590
MX W479	4301	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.582
MX W479	4493	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.603
MX W479	4586	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	4629	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.548
MX W479	4630	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.517
MX W479	4652	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.510
MX W479	4653	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.685
MX W479	4654	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556

MX W479	4656	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	4657	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.903
MX W479	4658	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.975
MX W479	4659	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.826
MX W479	4660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.741
MX W479	4661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.888
MX W479	4677	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.524
MX W479	4679	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	4680	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	4685	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.731
MX W479	4724	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	4996	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	5331	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.662
MX W479	5332	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561
MX W479	5471	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	5472	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	5475	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	5614	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.669
MX W479	5615	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.549
MX W479	5621	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.557
MX W479	5622	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.623
MX W479	5790	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.581
MX W479	5804	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	5805	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	5809	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	5812	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.675
MX W479	5813	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	5814	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	5979	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531

MX W479	5980	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.546
MX W479	6120	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	6121	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.501
MX W479	6125	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	6126	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	6142	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	6146	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.582
MX W479	6147	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.573
MX W479	6148	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.779
MX W479	6149	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.883
MX W479	6150	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.860
MX W479	6267	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.540
MX W479	6268	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	6271	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.529
MX W479	6286	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.595
MX W479	6292	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.577
MX W479	6294	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.615
MX W479	6405	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.611
MX W479	6406	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.887
MX W479	6407	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	6408	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.541
MX W479	6409	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	6410	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.740
MX W479	6411	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	6413	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	6430	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.587
MX W479	6431	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	6435	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.023
MX W479	6436	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778

MX W479	6486	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	6501	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.822
MX W479	6524	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.557
MX W479	6525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.600
MX W479	6526	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	6528	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.612
MX W479	6529	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	6530	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	6531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.662
MX W479	6532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.680
MX W479	6548	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.718
MX W479	6549	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.739
MX W479	6550	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.767
MX W479	6553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.592
MX W479	6554	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.776
MX W479	6555	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.581
MX W479	6556	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	6558	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.988
MX W479	6559	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.766
MX W479	6571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	6572	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.870
MX W479	6573	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.668
MX W479	6574	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.705
MX W479	6577	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.791
MX W479	6578	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	6579	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.622
MX W479	6580	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	6581	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.872
MX W479	6582	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.704

MX W479	6583	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	6596	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	6602	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	6791	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.545
MX W479	6835	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.564
MX W479	6836	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	6868	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	6870	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.516
MX W479	6890	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	6912	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.576
MX W479	6913	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	6914	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	6915	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	6917	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	6918	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	7014	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7099	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.534
MX W479	7100	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.759
MX W479	7101	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7103	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	7111	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	7123	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	7126	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.603
MX W479	7127	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	7129	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	7130	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.683
MX W479	7131	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	7132	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.525
MX W479	7195	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.554

MX W479 7196 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 7199 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.566

MX W479 7207 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 7220 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 7243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.628

MX W479 7244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 7246 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 7252 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.629

MX W479 7253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 7255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.681

MX W479 7316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.757

MX W479 7317 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 7318 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.570

MX W479 7319 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 7321 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 7323 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 7324 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 7326 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 7340 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.691

MX W479 7343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 7345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.627

MX W479 7346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 7351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 7363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 7364 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.215

MX W479 7366 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 7367 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.612

MX W479 7368 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.799

MX W479 7369 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.518

MX W479	7388	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	7389	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	7390	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.725
MX W479	7391	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.797
MX W479	7393	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7395	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	7396	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	7397	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	7399	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.656
MX W479	7400	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.686
MX W479	7446	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.641
MX W479	7462	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.761
MX W479	7468	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	7469	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.811
MX W479	7470	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.856
MX W479	7471	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.803
MX W479	7484	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.540
MX W479	7513	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.558
MX W479	7514	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.585
MX W479	7531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.594
MX W479	7543	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	7585	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.532
MX W479	7586	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.831
MX W479	7587	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.573
MX W479	7602	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.586
MX W479	7603	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561
MX W479	7660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.708
MX W479	7661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7681	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574

MX W479	7682	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7683	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.707
MX W479	7684	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.628
MX W479	7753	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.641
MX W479	7755	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.502
MX W479	7794	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.607
MX W479	7796	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.032
MX W479	7797	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.212
MX W479	7798	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.800
MX W479	7801	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.637
MX W479	7802	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.906
MX W479	7803	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	7804	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	7805	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.048
MX W479	7806	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.021
MX W479	7807	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.755
MX W479	7819	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.902
MX W479	7867	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	7869	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	7873	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	7878	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	7879	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	7891	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	7892	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.532
MX W479	7894	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	7896	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	7897	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.506
MX W479	7898	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.761
MX W479	7899	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.773

MX W479	7900	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	7901	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.852
MX W479	7941	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	7948	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7989	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.671
MX W479	7990	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	7991	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	7992	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.622
MX W479	7993	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.288
MX W479	7994	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.608
MX W479	7996	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.606
MX W479	8011	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	8041	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.505
MX W479	8042	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	8062	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	8067	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	8086	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.668
MX W479	8087	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.504
MX W479	8088	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.618
MX W479	8089	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	8090	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.585
MX W479	8091	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	8107	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.613
MX W479	8108	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	8111	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.564
MX W479	8112	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.633
MX W479	8116	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	8117	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.838
MX W479	8118	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.725

MX W479	8119	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.001
MX W479	8120	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.649
MX W479	8190	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	8191	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	8192	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	8202	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.572
MX W479	8203	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.563
MX W479	8204	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.511
MX W479	8206	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	8208	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.642
MX W479	8209	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.717
MX W479	8210	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.670
MX W479	8211	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	8213	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.701
MX W479	8214	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.584
MX W479	8215	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.714
MX W479	8216	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.687
MX W479	8229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	8230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	8231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	8235	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	8238	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	8301	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.642
MX W479	8304	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	8306	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.685
MX W479	8307	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	8311	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.550
MX W479	8350	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.596
MX W479	8356	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.511

MX W479	8358	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	8360	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	8427	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.593
MX W479	8428	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.548
MX W479	8442	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	8445	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	8447	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	8448	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	8450	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	8451	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.695
MX W479	8452	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.533
MX W479	8514	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	8553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.944
MX W479	8567	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.619
MX W479	8570	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.535
MX W479	8571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	8595	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626
MX W479	8646	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	8660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.567
MX W479	8730	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	8734	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	8735	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.560
MX W479	8760	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** MODEL SETUP OPTIONS SUMMARY ***

** Model Options Selected:

* Model Uses Regulatory DEFAULT Options
* Model Is Setup For Calculation of Average CONCentration Values.
* NO GAS DEPOSITION Data Provided.
* NO PARTICLE DEPOSITION Data Provided.
* Model Uses NO DRY DEPLETION. DDPLETE = F
* Model Uses NO WET DEPLETION. WETDPLT = F
* Stack-tip Downwash.
* Model Accounts for ELEVated Terrain Effects.
* Use Calms Processing Routine.
* Use Missing Data Processing Routine.
* No Exponential Decay.
* Model Uses RURAL Dispersion Only.
* BULKRN - Use BULKRN Delta-T and SolarRad option for SBL in AERMET
* Model Assumes No FLAGPOLE Receptor Heights.
* The User Specified a Pollutant Type of: NITRICOX

**Model Calculates 1 Short Term Average(s) of: 1-HR
and Calculates ANNUAL Averages

**This Run Includes: 1 Source(s); 1 Source Group(s); and 3106 Receptor(s)

with: 1 POINT(s), including

0 POINTCAP(s) and 0 POINTHOR(s)

and: 0 VOLUME source(s)

and: 0 AREA type source(s)

and: 0 LINE source(s)

and: 0 RLINE/RLINEXT source(s)

and: 0 OPENPIT source(s)

and: 0 BUOYANT LINE source(s) with a total of 0 line(s)

and: 0 SWPOINT source(s)

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 22112

**Output Options Selected:

Model Outputs Tables of ANNUAL Averages by Receptor

Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours

m for Missing Hours

b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1730.68 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0

Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07

Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 3.9 MB of RAM.

**Input Runstream File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**Output Print File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**File for Summary of Results: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***

(1=YES; 0=NO)

1 1 1

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***

(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:16:18

PAGE 3

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling
Met Version: 22112

Profile file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling

Surface format: FREE

Profile format: FREE

Surface station no.: 0 Upper air station no.: 23062

Name: UNKNOWN Name: DENVER WSFO, CO

Year: 2006 Year: 2006

First 24 hours of scalar data

YR MO DY JDY HR H0 U* W* DT/DZ ZICNV ZIMCH M-O LEN Z0 BOWEN ALBEDO REF WS WD HT REF TA HT

- -

06 01 01 1 01 -26.0 0.162 -9.000 -9.000 -999. 157. 11.8 0.01 1.89 1.00 4.43 326. 10.0 280.1 2.0

06 01 01 1 02 -58.1 0.325 -9.000 -9.000 -999. 445. 42.5 0.01 1.89 1.00 6.57 310. 10.0 281.4
2.0

06 01 01 1 03 -33.0 0.292 -9.000 -9.000 -999. 380. 54.5 0.01 1.89 1.00 5.72 272. 10.0 281.0
2.0

06 01 01 1 04 -14.9 0.128 -9.000 -9.000 -999. 134. 10.2 0.01 1.89 1.00 3.67 320. 10.0 279.8
2.0

06 01 01 1 05 -13.5 0.124 -9.000 -9.000 -999. 105. 10.1 0.01 1.89 1.00 3.71 337. 10.0 279.0
2.0

06 01 01 1 06 -18.3 0.176 -9.000 -9.000 -999. 177. 21.3 0.01 1.89 1.00 4.29 344. 10.0 278.3
2.0

06 01 01 1 07 -34.9 0.286 -9.000 -9.000 -999. 367. 48.1 0.01 1.89 1.00 5.68 327. 10.0 279.3
2.0

06 01 01 1 08 -39.7 0.440 -9.000 -9.000 -999. 701. 154.4 0.01 1.89 1.00 7.96 307. 10.0 279.8
2.0

06 01 01 1 09 -17.3 0.580 -9.000 -9.000 -999. 1058. 810.0 0.01 1.89 0.43 10.10 287. 10.0 279.4
2.0

06 01 01 1 10 38.3 0.682 0.602 0.005 164. 1349. -597.0 0.01 1.89 0.31 11.67 301. 10.0 280.9
2.0

06 01 01 1 11 83.4 0.893 1.120 0.005 486. 2020. -616.6 0.01 1.89 0.26 15.29 291. 10.0 281.4
2.0

06 01 01 1 12 97.2 0.889 1.326 0.005 693. 2013. -521.8 0.01 1.89 0.24 15.20 293. 10.0 281.3
2.0

06 01 01 1 13 137.5 0.968 1.629 0.005 909. 2279. -476.9 0.01 1.89 0.24 16.54 291. 10.0
281.3 2.0

06 01 01 1 14 122.9 0.912 1.653 0.005 1063. 2100. -445.7 0.01 1.89 0.25 15.56 290. 10.0
281.0 2.0

06 01 01 1 15 67.7 0.795 1.385 0.005 1138. 1727. -536.6 0.01 1.89 0.30 13.59 295. 10.0
280.1 2.0

06 01 01 1 16 0.0 0.715 -9.000 -9.000 -999. 1464. 8888.0 0.01 1.89 0.41 12.34 301. 10.0 279.0
2.0

06 01 01 1 17 0.0 0.673 -9.000 -9.000 -999. 1330. 8888.0 0.01 1.89 0.72 11.62 304. 10.0 277.1
2.0

06 01 01 1 18 0.0 0.546 -9.000 -9.000 -999. 987. 8888.0 0.01 1.89 1.00 9.43 293. 10.0 275.9
2.0

06 01 01 1 19 -46.9 0.630 -9.000 -9.000 -999. 1199. 388.5 0.01 1.89 1.00 11.09 294. 10.0 276.2
2.0

06 01 01 1 20 -49.7 0.337 -9.000 -9.000 -999. 566. 55.9 0.01 1.89 1.00 6.57 310. 10.0 275.6
2.0

06 01 01 1 21 -29.5 0.194 -9.000 -9.000 -999. 235. 17.9 0.01 1.89 1.00 4.69 313. 10.0 274.4
2.0

06 01 01 1 22 -29.9 0.238 -9.000 -9.000 -999. 279. 32.8 0.01 1.89 1.00 5.32 338. 10.0 275.8
2.0

06 01 01 1 23 -15.8 0.134 -9.000 -9.000 -999. 123. 11.1 0.01 1.89 1.00 3.67 241. 10.0 274.5
2.0

06 01 01 1 24 -19.1 0.117 -9.000 -9.000 -999. 96. 6.1 0.01 1.89 1.00 3.98 279. 10.0 273.6
2.0

First hour of profile data

YR MO DY HR HEIGHT F WDIR WSPD AMB_TMP sigmaA sigmaW sigmaV

06 01 01 01 2.0 0 -999. -99.00 280.1 99.0 -99.00 -99.00

06 01 01 01 10.0 0 326. 4.43 282.0 5.4 -99.00 0.42

06 01 01 01 60.0 1 316. 5.10 283.1 6.1 -99.00 0.54

F indicates top of profile (=1) or below (=0)

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NITRICOX IN MICROGRAMS/M**3 **

NETWORK

GROUP ID AVERAGE CONC RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

ALL 1ST HIGHEST VALUE IS 0.10354 AT (499450.00, 4508500.00, 1603.57, 1603.57, 0.00) DC

2ND HIGHEST VALUE IS 0.10127 AT (499450.00, 4508450.00, 1603.33, 1603.33, 0.00) DC

3RD HIGHEST VALUE IS 0.10055 AT (499700.00, 4508150.00, 1610.72, 1610.72, 0.00) DC

4TH HIGHEST VALUE IS 0.09863 AT (499450.00, 4508550.00, 1603.86, 1603.86, 0.00) DC

5TH HIGHEST VALUE IS 0.09763 AT (499750.00, 4508100.00, 1608.86, 1608.86, 0.00) DC

6TH HIGHEST VALUE IS 0.09637 AT (499750.00, 4508150.00, 1610.15, 1610.15, 0.00) DC

7TH HIGHEST VALUE IS 0.09586 AT (499700.00, 4508100.00, 1609.85, 1609.85, 0.00) DC

8TH HIGHEST VALUE IS 0.09537 AT (499400.00, 4508500.00, 1603.34, 1603.34, 0.00) DC

9TH HIGHEST VALUE IS 0.09492 AT (499800.00, 4508100.00, 1606.47, 1606.47, 0.00) DC

10TH HIGHEST VALUE IS 0.09330 AT (499400.00, 4508550.00, 1603.60, 1603.60, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF NITRICOX IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	NETWORK RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

ALL HIGH 1ST HIGH VALUE IS 7.13016 ON 06102824: AT (499600.00, 4508200.00, 1608.71, 1608.71, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)

A Total of 624 Warning Message(s)

A Total of 142 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 1 Calm Hours Identified

A Total of 141 Missing Hours Identified (1.61 Percent)

******** FATAL ERROR MESSAGES ********

*** NONE ***

******** WARNING MESSAGES ********

ME W181 3169 MEOPEN: BULKRN Delta-T & SolarRad option for SBL was used in AERMET

MX W403 3169 PFLCNV: Turbulence data is being used w/o ADJ_U* option SigA Data

MX W479 24 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 29 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 30 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 31 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 48 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 51 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 52 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 53 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 141 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 143 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.877

MX W479 147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 151 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 215 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 216 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 221 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 222 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.588

MX W479 244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 291 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.544

MX W479 296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 308 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.572

MX W479 312 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 313 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.700

MX W479 314 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 317 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.795

MX W479 318 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 320 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 321 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 340 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 342 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 475 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.580

MX W479 479 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 482 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.746

MX W479 483 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 484 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 486 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 487 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.681

MX W479 488 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.697

MX W479 489 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.921

MX W479 509 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 524 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 526 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 527 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 528 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.926

MX W479 529 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.676

MX W479 530 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.808

MX W479 531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.740

MX W479 532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.537

MX W479 533 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.621

MX W479 534 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.830

MX W479 535 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 554 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 555 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 556 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 573 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.536

MX W479 574 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.241

MX W479 575 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 576 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.562

MX W479 577 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 578 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.213

MX W479 579 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 580 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 581 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.713

MX W479 582 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.678

MX W479 583 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.869

MX W479 584 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 595 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 597 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.667

MX W479 599 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.596

MX W479 600 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 601 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.705

MX W479 605 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.665

MX W479 632 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 725 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 727 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 775 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 822 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 837 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 838 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 839 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 932 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 1029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 1031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479 1034 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 1035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 1051 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 1052 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 1053 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.884

MX W479 1054 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.859

MX W479	1055	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.766
MX W479	1056	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.677
MX W479	1060	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	1061	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.639
MX W479	1197	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	1198	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.709
MX W479	1199	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	1200	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.530
MX W479	1201	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.663
MX W479	1202	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.650
MX W479	1203	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.590
MX W479	1204	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.726
MX W479	1205	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.750
MX W479	1206	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.700
MX W479	1208	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	1218	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	1219	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.824
MX W479	1220	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	1221	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.731
MX W479	1222	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	1223	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	1224	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	1225	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	1226	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753
MX W479	1227	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	1228	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	1229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602
MX W479	1230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	1231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753

MX W479 1243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 1244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 1245 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 1276 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 1277 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 1278 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.729

MX W479 1293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 1294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.851

MX W479 1295 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 1296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 1297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 1300 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 1301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.723

MX W479 1302 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 1303 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 1316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.692

MX W479 1343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 1344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.720

MX W479 1345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 1346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 1347 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.663

MX W479 1348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 1363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 1365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.696

MX W479 1373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 1374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1375 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.622

MX W479	1392	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	1394	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.577
MX W479	1395	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	1396	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.671
MX W479	1397	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	1441	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	1442	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	1483	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.647
MX W479	1532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	1537	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	1539	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.613
MX W479	1540	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	1541	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.648
MX W479	1543	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614
MX W479	1566	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.569
MX W479	1661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.575
MX W479	1989	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	1990	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	1991	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	1993	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.563
MX W479	1994	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.534
MX W479	2086	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	2088	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	2089	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	2093	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	2228	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.579
MX W479	2229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	2230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.693
MX W479	2231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.634

MX W479 2232 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.632

MX W479 2234 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 2235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 2253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 2254 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 2255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.755

MX W479 2262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 2348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 2349 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2350 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 2351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2352 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.834

MX W479 2353 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 2354 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2355 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.560

MX W479 2356 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 2373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.752

MX W479 2374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 2378 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 2379 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 2380 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 2382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 2399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.920

MX W479 2421 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2422 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 2424 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 2425 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 2428 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 2429 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 2430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 2445 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2447 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.779

MX W479 2448 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 2449 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.733

MX W479 2450 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 2468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.019

MX W479 2470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.976

MX W479 2471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.882

MX W479 2472 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.650

MX W479 2542 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.826

MX W479 2544 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 2545 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.629

MX W479 2546 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.769

MX W479 2547 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.656

MX W479 2548 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.679

MX W479 2549 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.853

MX W479 2550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2615 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 2616 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 2617 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2639 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 2640 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2641 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.777

MX W479 2643 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 2645 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479	2646	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	2660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	2663	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.896
MX W479	2664	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	2666	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	2669	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	2670	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.500
MX W479	2763	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.504
MX W479	2783	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.567
MX W479	2786	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.588
MX W479	2788	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.748
MX W479	2789	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	2832	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.501
MX W479	2833	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.506
MX W479	2900	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	2901	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.673
MX W479	2902	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.730
MX W479	2903	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	2905	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	2906	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753
MX W479	2907	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	3045	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.549
MX W479	3047	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.554
MX W479	3048	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	3148	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	3149	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	3168	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	3169	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	3170	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.601

MX W479	3171	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.796
MX W479	3172	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	3173	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.889
MX W479	3174	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	3239	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	3262	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.633
MX W479	3263	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	3289	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.546
MX W479	3290	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.586
MX W479	3291	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.607
MX W479	3293	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	3294	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	3313	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	3316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.595
MX W479	3337	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	3338	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.521
MX W479	3339	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	3363	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.584
MX W479	3364	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	3365	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	3366	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.576
MX W479	3382	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.620
MX W479	3383	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.727
MX W479	3384	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.606
MX W479	3453	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.648
MX W479	3454	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.711
MX W479	3457	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	3509	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.654
MX W479	3525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614

MX W479	3671	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.541
MX W479	3674	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	3693	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	3748	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.562
MX W479	3792	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.536
MX W479	3796	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.568
MX W479	4029	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.848
MX W479	4030	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.707
MX W479	4031	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	4035	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	4036	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	4037	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	4057	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.502
MX W479	4080	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	4101	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.545
MX W479	4102	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	4103	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.847
MX W479	4104	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.608
MX W479	4105	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	4172	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.682
MX W479	4173	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.824
MX W479	4227	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	4297	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	4298	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.590
MX W479	4301	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.582
MX W479	4493	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.603
MX W479	4586	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	4629	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.548
MX W479	4630	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.517

MX W479	4652	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.510
MX W479	4653	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.685
MX W479	4654	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	4656	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	4657	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.903
MX W479	4658	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.975
MX W479	4659	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.826
MX W479	4660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.741
MX W479	4661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.888
MX W479	4677	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.524
MX W479	4679	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	4680	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	4685	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.731
MX W479	4724	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	4996	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	5331	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.662
MX W479	5332	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561
MX W479	5471	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	5472	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	5475	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	5614	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.669
MX W479	5615	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.549
MX W479	5621	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.557
MX W479	5622	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.623
MX W479	5790	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.581
MX W479	5804	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	5805	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	5809	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	5812	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.675

MX W479	5813	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	5814	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	5979	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	5980	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.546
MX W479	6120	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	6121	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.501
MX W479	6125	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	6126	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	6142	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	6146	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.582
MX W479	6147	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.573
MX W479	6148	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.779
MX W479	6149	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.883
MX W479	6150	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.860
MX W479	6267	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.540
MX W479	6268	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	6271	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.529
MX W479	6286	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.595
MX W479	6292	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.577
MX W479	6294	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.615
MX W479	6405	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.611
MX W479	6406	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.887
MX W479	6407	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	6408	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.541
MX W479	6409	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	6410	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.740
MX W479	6411	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	6413	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	6430	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.587

MX W479	6431	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	6435	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.023
MX W479	6436	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	6486	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	6501	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.822
MX W479	6524	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.557
MX W479	6525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.600
MX W479	6526	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	6528	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.612
MX W479	6529	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	6530	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	6531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.662
MX W479	6532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.680
MX W479	6548	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.718
MX W479	6549	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.739
MX W479	6550	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.767
MX W479	6553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.592
MX W479	6554	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.776
MX W479	6555	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.581
MX W479	6556	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	6558	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.988
MX W479	6559	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.766
MX W479	6571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	6572	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.870
MX W479	6573	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.668
MX W479	6574	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.705
MX W479	6577	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.791
MX W479	6578	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	6579	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.622

MX W479	6580	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	6581	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.872
MX W479	6582	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.704
MX W479	6583	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	6596	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	6602	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	6791	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.545
MX W479	6835	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.564
MX W479	6836	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	6868	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	6870	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.516
MX W479	6890	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	6912	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.576
MX W479	6913	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	6914	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	6915	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	6917	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	6918	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	7014	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7099	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.534
MX W479	7100	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.759
MX W479	7101	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7103	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	7111	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	7123	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	7126	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.603
MX W479	7127	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	7129	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	7130	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.683

MX W479	7131	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	7132	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.525
MX W479	7195	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.554
MX W479	7196	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	7199	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	7207	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	7220	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.644
MX W479	7243	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.628
MX W479	7244	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.575
MX W479	7246	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.712
MX W479	7252	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.629
MX W479	7253	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	7255	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.681
MX W479	7316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.757
MX W479	7317	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.558
MX W479	7318	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.570
MX W479	7319	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	7321	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602
MX W479	7323	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	7324	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.578
MX W479	7326	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	7340	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.691
MX W479	7343	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.510
MX W479	7345	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	7346	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	7351	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	7363	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	7364	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.215
MX W479	7366	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.516

MX W479	7367	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.612
MX W479	7368	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.799
MX W479	7369	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.518
MX W479	7388	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	7389	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	7390	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.725
MX W479	7391	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.797
MX W479	7393	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7395	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	7396	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	7397	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	7399	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.656
MX W479	7400	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.686
MX W479	7446	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.641
MX W479	7462	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.761
MX W479	7468	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	7469	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.811
MX W479	7470	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.856
MX W479	7471	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.803
MX W479	7484	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.540
MX W479	7513	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.558
MX W479	7514	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.585
MX W479	7531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.594
MX W479	7543	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	7585	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.532
MX W479	7586	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.831
MX W479	7587	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.573
MX W479	7602	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.586
MX W479	7603	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561

MX W479	7660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.708
MX W479	7661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7681	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	7682	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7683	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.707
MX W479	7684	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.628
MX W479	7753	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.641
MX W479	7755	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.502
MX W479	7794	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.607
MX W479	7796	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.032
MX W479	7797	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.212
MX W479	7798	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.800
MX W479	7801	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.637
MX W479	7802	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.906
MX W479	7803	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	7804	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	7805	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.048
MX W479	7806	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.021
MX W479	7807	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.755
MX W479	7819	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.902
MX W479	7867	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	7869	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	7873	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	7878	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	7879	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	7891	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	7892	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.532
MX W479	7894	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	7896	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556

MX W479	7897	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.506
MX W479	7898	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.761
MX W479	7899	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.773
MX W479	7900	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	7901	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.852
MX W479	7941	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	7948	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7989	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.671
MX W479	7990	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	7991	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	7992	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.622
MX W479	7993	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.288
MX W479	7994	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.608
MX W479	7996	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.606
MX W479	8011	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	8041	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.505
MX W479	8042	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	8062	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	8067	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	8086	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.668
MX W479	8087	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.504
MX W479	8088	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.618
MX W479	8089	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	8090	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.585
MX W479	8091	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	8107	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.613
MX W479	8108	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	8111	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.564
MX W479	8112	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.633

MX W479	8116	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	8117	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.838
MX W479	8118	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.725
MX W479	8119	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.001
MX W479	8120	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.649
MX W479	8190	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	8191	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	8192	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	8202	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.572
MX W479	8203	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.563
MX W479	8204	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.511
MX W479	8206	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	8208	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.642
MX W479	8209	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.717
MX W479	8210	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.670
MX W479	8211	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	8213	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.701
MX W479	8214	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.584
MX W479	8215	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.714
MX W479	8216	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.687
MX W479	8229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	8230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	8231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	8235	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	8238	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	8301	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.642
MX W479	8304	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	8306	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.685
MX W479	8307	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574

MX W479 8311 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.550

MX W479 8350 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.596

MX W479 8356 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.511

MX W479 8358 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 8360 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 8427 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.593

MX W479 8428 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.548

MX W479 8442 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.566

MX W479 8445 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 8447 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 8448 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.591

MX W479 8450 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.583

MX W479 8451 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.695

MX W479 8452 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.533

MX W479 8514 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 8553 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.944

MX W479 8567 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.619

MX W479 8570 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 8571 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.544

MX W479 8595 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.626

MX W479 8646 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 8660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.567

MX W479 8730 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 8734 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.672

MX W479 8735 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.560

MX W479 8760 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.626

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** MODEL SETUP OPTIONS SUMMARY ***

** Model Options Selected:

* Model Uses Regulatory DEFAULT Options
* Model Is Setup For Calculation of Average CONCentration Values.
* NO GAS DEPOSITION Data Provided.
* NO PARTICLE DEPOSITION Data Provided.
* Model Uses NO DRY DEPLETION. DDPLETE = F
* Model Uses NO WET DEPLETION. WETDPLT = F
* Stack-tip Downwash.
* Model Accounts for ELEVated Terrain Effects.
* Use Calms Processing Routine.
* Use Missing Data Processing Routine.
* No Exponential Decay.
* Model Uses RURAL Dispersion Only.
* BULKRN - Use BULKRN Delta-T and SolarRad option for SBL in AERMET
* Model Assumes No FLAGPOLE Receptor Heights.
* The User Specified a Pollutant Type of: CARBONMO

**Model Calculates 2 Short Term Average(s) of: 1-HR 8-HR

**This Run Includes: 1 Source(s); 1 Source Group(s); and 3106 Receptor(s)

with: 1 POINT(s), including

0 POINTCAP(s) and 0 POINTHOR(s)

and: 0 VOLUME source(s)

and: 0 AREA type source(s)

and: 0 LINE source(s)

and: 0 RLINE/RLINEXT source(s)

and: 0 OPENPIT source(s)

and: 0 BUOYANT LINE source(s) with a total of 0 line(s)

and: 0 SWPOINT source(s)

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 22112

**Output Options Selected:

Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours

m for Missing Hours

b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1730.68 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0

Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07

Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 3.9 MB of RAM.

**Input Runstream File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**Output Print File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**File for Summary of Results: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***

(1=YES; 0=NO)

1 1 1

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***

(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling
Met Version: 22112

Profile file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling

Surface format: FREE

Profile format: FREE

Surface station no.: 0 Upper air station no.: 23062

Name: UNKNOWN Name: DENVER WSFO, CO

Year: 2006 Year: 2006

First 24 hours of scalar data

YR MO DY JDY HR H0 U* W* DT/DZ ZICNV ZIMCH M-O LEN Z0 BOWEN ALBEDO REF WS WD HT REF TA HT

- -

06 01 01 1 01 -26.0 0.162 -9.000 -9.000 -999. 157. 11.8 0.01 1.89 1.00 4.43 326. 10.0 280.1 2.0

06 01 01 1 02 -58.1 0.325 -9.000 -9.000 -999. 445. 42.5 0.01 1.89 1.00 6.57 310. 10.0 281.4 2.0

06 01 01 1 03 -33.0 0.292 -9.000 -9.000 -999. 380. 54.5 0.01 1.89 1.00 5.72 272. 10.0 281.0
2.0

06 01 01 1 04 -14.9 0.128 -9.000 -9.000 -999. 134. 10.2 0.01 1.89 1.00 3.67 320. 10.0 279.8
2.0

06 01 01 1 05 -13.5 0.124 -9.000 -9.000 -999. 105. 10.1 0.01 1.89 1.00 3.71 337. 10.0 279.0
2.0

06 01 01 1 06 -18.3 0.176 -9.000 -9.000 -999. 177. 21.3 0.01 1.89 1.00 4.29 344. 10.0 278.3
2.0

06 01 01 1 07 -34.9 0.286 -9.000 -9.000 -999. 367. 48.1 0.01 1.89 1.00 5.68 327. 10.0 279.3
2.0

06 01 01 1 08 -39.7 0.440 -9.000 -9.000 -999. 701. 154.4 0.01 1.89 1.00 7.96 307. 10.0 279.8
2.0

06 01 01 1 09 -17.3 0.580 -9.000 -9.000 -999. 1058. 810.0 0.01 1.89 0.43 10.10 287. 10.0 279.4
2.0

06 01 01 1 10 38.3 0.682 0.602 0.005 164. 1349. -597.0 0.01 1.89 0.31 11.67 301. 10.0 280.9
2.0

06 01 01 1 11 83.4 0.893 1.120 0.005 486. 2020. -616.6 0.01 1.89 0.26 15.29 291. 10.0 281.4
2.0

06 01 01 1 12 97.2 0.889 1.326 0.005 693. 2013. -521.8 0.01 1.89 0.24 15.20 293. 10.0 281.3
2.0

06 01 01 1 13 137.5 0.968 1.629 0.005 909. 2279. -476.9 0.01 1.89 0.24 16.54 291. 10.0
281.3 2.0

06 01 01 1 14 122.9 0.912 1.653 0.005 1063. 2100. -445.7 0.01 1.89 0.25 15.56 290. 10.0
281.0 2.0

06 01 01 1 15 67.7 0.795 1.385 0.005 1138. 1727. -536.6 0.01 1.89 0.30 13.59 295. 10.0
280.1 2.0

06 01 01 1 16 0.0 0.715 -9.000 -9.000 -999. 1464. 8888.0 0.01 1.89 0.41 12.34 301. 10.0 279.0
2.0

06 01 01 1 17 0.0 0.673 -9.000 -9.000 -999. 1330. 8888.0 0.01 1.89 0.72 11.62 304. 10.0 277.1
2.0

06 01 01 1 18 0.0 0.546 -9.000 -9.000 -999. 987. 8888.0 0.01 1.89 1.00 9.43 293. 10.0 275.9
2.0

06 01 01 1 19 -46.9 0.630 -9.000 -9.000 -999. 1199. 388.5 0.01 1.89 1.00 11.09 294. 10.0 276.2
2.0

06 01 01 1 20 -49.7 0.337 -9.000 -9.000 -999. 566. 55.9 0.01 1.89 1.00 6.57 310. 10.0 275.6 2.0

06 01 01 1 21 -29.5 0.194 -9.000 -9.000 -999. 235. 17.9 0.01 1.89 1.00 4.69 313. 10.0 274.4 2.0

06 01 01 1 22 -29.9 0.238 -9.000 -9.000 -999. 279. 32.8 0.01 1.89 1.00 5.32 338. 10.0 275.8 2.0

06 01 01 1 23 -15.8 0.134 -9.000 -9.000 -999. 123. 11.1 0.01 1.89 1.00 3.67 241. 10.0 274.5 2.0

06 01 01 1 24 -19.1 0.117 -9.000 -9.000 -999. 96. 6.1 0.01 1.89 1.00 3.98 279. 10.0 273.6 2.0

First hour of profile data

YR MO DY HR HEIGHT F WDIR WSPD AMB_TMP sigmaA sigmaW sigmaV

06 01 01 01 2.0 0 -999. -99.00 280.1 99.0 -99.00 -99.00

06 01 01 01 10.0 0 326. 4.43 282.0 5.4 -99.00 0.42

06 01 01 01 60.0 1 316. 5.10 283.1 6.1 -99.00 0.54

F indicates top of profile (=1) or below (=0)

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:17:40

PAGE 4

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CARBONMO IN MICROGRAMS/M**3 **

DATE NETWORK

GROUP ID AVERAGE CONC (YYMMDDHH) RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

- -

ALL HIGH 1ST HIGH VALUE IS 16.75157 ON 06102824: AT (499600.00, 4508200.00, 1608.71, 1608.71, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CARBONMO IN MICROGRAMS/M**3 **

DATE NETWORK

GROUP ID AVERAGE CONC (YYMMDDHH) RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

- -

ALL HIGH 1ST HIGH VALUE IS 10.33737 ON 06092308: AT (499650.00, 4508050.00, 1606.22, 1606.22, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)

A Total of 624 Warning Message(s)

A Total of 142 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 1 Calm Hours Identified

A Total of 141 Missing Hours Identified (1.61 Percent)

******** FATAL ERROR MESSAGES ********

*** NONE ***

******** WARNING MESSAGES ********

ME W181 3169 MEOPEN: BULKRN Delta-T & SolarRad option for SBL was used in AERMET

MX W403 3169 PFLCNV: Turbulence data is being used w/o ADJ_U* option SigA Data

MX W479 24 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 29 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 30 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 31 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 48 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 51 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 52 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 53 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 141 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 143 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.877

MX W479 147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 151 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 215 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 216 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 221 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 222 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.588

MX W479 244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 291 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.544

MX W479 296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 308 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.572

MX W479 312 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 313 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.700

MX W479 314 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 317 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.795

MX W479 318 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 320 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 321 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 340 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 342 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 475 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.580

MX W479 479 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 482 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.746

MX W479 483 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 484 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 486 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 487 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.681

MX W479 488 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.697

MX W479 489 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.921

MX W479 509 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 524 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 526 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 527 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 528 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.926

MX W479 529 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.676

MX W479 530 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.808

MX W479 531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.740

MX W479 532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.537

MX W479 533 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.621

MX W479 534 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.830

MX W479 535 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 554 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 555 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 556 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 573 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.536

MX W479 574 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.241

MX W479 575 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 576 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.562

MX W479 577 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 578 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.213

MX W479 579 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 580 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 581 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.713

MX W479 582 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.678

MX W479 583 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.869

MX W479 584 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 595 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 597 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.667

MX W479 599 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.596

MX W479 600 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 601 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.705

MX W479 605 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.665

MX W479 632 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 725 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 727 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 775 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 822 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 837 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 838 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 839 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 932 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 1029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 1031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479 1034 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 1035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 1051 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 1052 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 1053 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.884

MX W479 1054 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.859

MX W479 1055 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.766

MX W479 1056 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.677

MX W479 1060 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 1061 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.639

MX W479 1197 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 1198 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.709

MX W479 1199 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.645

MX W479 1200 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.530

MX W479 1201 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.663

MX W479 1202 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.650

MX W479 1203 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.590

MX W479 1204 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.726

MX W479 1205 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.750

MX W479 1206 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.700

MX W479 1208 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 1218 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 1219 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.824

MX W479 1220 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 1221 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.731

MX W479 1222 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 1223 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 1224 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 1225 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 1226 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.753

MX W479 1227 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.778

MX W479 1228 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 1229 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 1230 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 1231 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.753

MX W479 1243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 1244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 1245 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 1276 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 1277 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 1278 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.729

MX W479 1293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 1294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.851

MX W479 1295 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 1296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479	1297	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.576
MX W479	1300	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.634
MX W479	1301	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.723
MX W479	1302	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561
MX W479	1303	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.516
MX W479	1316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.692
MX W479	1343	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	1344	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.720
MX W479	1345	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	1346	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.501
MX W479	1347	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.663
MX W479	1348	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	1351	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	1363	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.558
MX W479	1365	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.696
MX W479	1373	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.592
MX W479	1374	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.644
MX W479	1375	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.644
MX W479	1389	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.622
MX W479	1392	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	1394	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.577
MX W479	1395	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	1396	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.671
MX W479	1397	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	1441	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	1442	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	1483	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.647
MX W479	1532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	1537	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520

MX W479	1539	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.613
MX W479	1540	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	1541	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.648
MX W479	1543	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614
MX W479	1566	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.569
MX W479	1661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.575
MX W479	1989	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	1990	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	1991	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	1993	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.563
MX W479	1994	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.534
MX W479	2086	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	2088	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	2089	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	2093	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	2228	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.579
MX W479	2229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	2230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.693
MX W479	2231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.634
MX W479	2232	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.632
MX W479	2234	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	2235	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.736
MX W479	2253	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	2254	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.510
MX W479	2255	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.755
MX W479	2262	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.806
MX W479	2348	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.575
MX W479	2349	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.568
MX W479	2350	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690

MX W479 2351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2352 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.834

MX W479 2353 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 2354 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2355 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.560

MX W479 2356 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 2373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.752

MX W479 2374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 2378 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 2379 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 2380 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 2382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 2399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.920

MX W479 2421 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2422 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 2424 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 2425 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 2428 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 2429 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 2430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 2445 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2447 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.779

MX W479 2448 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 2449 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.733

MX W479 2450 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 2468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.019

MX W479 2470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.976

MX W479	2471	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.882
MX W479	2472	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.650
MX W479	2542	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.620
MX W479	2543	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.826
MX W479	2544	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.734
MX W479	2545	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.629
MX W479	2546	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.769
MX W479	2547	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.656
MX W479	2548	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.679
MX W479	2549	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.853
MX W479	2550	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	2615	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	2616	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	2617	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614
MX W479	2639	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	2640	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	2641	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.777
MX W479	2643	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.648
MX W479	2645	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602
MX W479	2646	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	2660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	2663	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.896
MX W479	2664	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	2666	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	2669	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	2670	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.500
MX W479	2763	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.504
MX W479	2783	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.567
MX W479	2786	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.588

MX W479	2788	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.748
MX W479	2789	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	2832	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.501
MX W479	2833	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.506
MX W479	2900	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	2901	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.673
MX W479	2902	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.730
MX W479	2903	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	2905	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	2906	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753
MX W479	2907	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	3045	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.549
MX W479	3047	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.554
MX W479	3048	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	3148	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	3149	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	3168	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	3169	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	3170	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.601
MX W479	3171	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.796
MX W479	3172	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	3173	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.889
MX W479	3174	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	3239	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	3262	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.633
MX W479	3263	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	3289	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.546
MX W479	3290	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.586
MX W479	3291	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.607

MX W479	3293	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	3294	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	3313	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	3316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.595
MX W479	3337	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	3338	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.521
MX W479	3339	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	3363	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.584
MX W479	3364	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	3365	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	3366	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.576
MX W479	3382	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.620
MX W479	3383	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.727
MX W479	3384	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.606
MX W479	3453	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.648
MX W479	3454	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.711
MX W479	3457	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	3509	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.654
MX W479	3525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614
MX W479	3671	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.541
MX W479	3674	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	3693	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	3748	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.562
MX W479	3792	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.536
MX W479	3796	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.568
MX W479	4029	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.848
MX W479	4030	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.707
MX W479	4031	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	4035	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520

MX W479 4036 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.645

MX W479 4037 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 4057 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.502

MX W479 4080 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 4101 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.545

MX W479 4102 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 4103 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.847

MX W479 4104 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 4105 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 4172 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.682

MX W479 4173 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.824

MX W479 4227 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 4297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 4298 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.590

MX W479 4301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 4493 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 4586 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 4629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.548

MX W479 4630 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 4652 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 4653 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.685

MX W479 4654 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 4656 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 4657 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.903

MX W479 4658 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.975

MX W479 4659 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.826

MX W479 4660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.741

MX W479 4661 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.888

MX W479 4677 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.524

MX W479	4679	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	4680	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	4685	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.731
MX W479	4724	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	4996	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	5331	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.662
MX W479	5332	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561
MX W479	5471	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	5472	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	5475	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	5614	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.669
MX W479	5615	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.549
MX W479	5621	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.557
MX W479	5622	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.623
MX W479	5790	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.581
MX W479	5804	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	5805	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	5809	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	5812	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.675
MX W479	5813	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	5814	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	5979	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	5980	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.546
MX W479	6120	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	6121	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.501
MX W479	6125	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	6126	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	6142	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	6146	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.582

MX W479	6147	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.573
MX W479	6148	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.779
MX W479	6149	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.883
MX W479	6150	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.860
MX W479	6267	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.540
MX W479	6268	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	6271	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.529
MX W479	6286	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.595
MX W479	6292	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.577
MX W479	6294	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.615
MX W479	6405	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.611
MX W479	6406	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.887
MX W479	6407	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	6408	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.541
MX W479	6409	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	6410	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.740
MX W479	6411	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	6413	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	6430	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.587
MX W479	6431	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	6435	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.023
MX W479	6436	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	6486	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	6501	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.822
MX W479	6524	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.557
MX W479	6525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.600
MX W479	6526	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	6528	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.612
MX W479	6529	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627

MX W479	6530	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	6531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.662
MX W479	6532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.680
MX W479	6548	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.718
MX W479	6549	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.739
MX W479	6550	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.767
MX W479	6553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.592
MX W479	6554	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.776
MX W479	6555	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.581
MX W479	6556	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	6558	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.988
MX W479	6559	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.766
MX W479	6571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	6572	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.870
MX W479	6573	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.668
MX W479	6574	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.705
MX W479	6577	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.791
MX W479	6578	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	6579	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.622
MX W479	6580	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	6581	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.872
MX W479	6582	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.704
MX W479	6583	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	6596	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	6602	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	6791	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.545
MX W479	6835	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.564
MX W479	6836	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	6868	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512

MX W479	6870	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.516
MX W479	6890	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	6912	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.576
MX W479	6913	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	6914	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	6915	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	6917	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	6918	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	7014	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7099	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.534
MX W479	7100	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.759
MX W479	7101	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7103	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	7111	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	7123	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	7126	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.603
MX W479	7127	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	7129	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	7130	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.683
MX W479	7131	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	7132	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.525
MX W479	7195	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.554
MX W479	7196	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	7199	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	7207	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	7220	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.644
MX W479	7243	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.628
MX W479	7244	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.575
MX W479	7246	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.712

MX W479	7252	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.629
MX W479	7253	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	7255	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.681
MX W479	7316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.757
MX W479	7317	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.558
MX W479	7318	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.570
MX W479	7319	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	7321	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602
MX W479	7323	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	7324	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.578
MX W479	7326	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	7340	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.691
MX W479	7343	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.510
MX W479	7345	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	7346	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	7351	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	7363	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	7364	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.215
MX W479	7366	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.516
MX W479	7367	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.612
MX W479	7368	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.799
MX W479	7369	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.518
MX W479	7388	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	7389	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	7390	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.725
MX W479	7391	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.797
MX W479	7393	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7395	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	7396	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559

MX W479	7397	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	7399	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.656
MX W479	7400	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.686
MX W479	7446	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.641
MX W479	7462	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.761
MX W479	7468	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	7469	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.811
MX W479	7470	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.856
MX W479	7471	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.803
MX W479	7484	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.540
MX W479	7513	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.558
MX W479	7514	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.585
MX W479	7531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.594
MX W479	7543	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	7585	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.532
MX W479	7586	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.831
MX W479	7587	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.573
MX W479	7602	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.586
MX W479	7603	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561
MX W479	7660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.708
MX W479	7661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7681	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	7682	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7683	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.707
MX W479	7684	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.628
MX W479	7753	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.641
MX W479	7755	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.502
MX W479	7794	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.607
MX W479	7796	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.032

MX W479	7797	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.212
MX W479	7798	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.800
MX W479	7801	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.637
MX W479	7802	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.906
MX W479	7803	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	7804	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	7805	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.048
MX W479	7806	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.021
MX W479	7807	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.755
MX W479	7819	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.902
MX W479	7867	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	7869	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	7873	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	7878	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	7879	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	7891	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	7892	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.532
MX W479	7894	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	7896	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	7897	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.506
MX W479	7898	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.761
MX W479	7899	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.773
MX W479	7900	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	7901	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.852
MX W479	7941	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	7948	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7989	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.671
MX W479	7990	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	7991	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627

MX W479	7992	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.622
MX W479	7993	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.288
MX W479	7994	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.608
MX W479	7996	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.606
MX W479	8011	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	8041	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.505
MX W479	8042	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	8062	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	8067	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	8086	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.668
MX W479	8087	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.504
MX W479	8088	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.618
MX W479	8089	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	8090	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.585
MX W479	8091	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	8107	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.613
MX W479	8108	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	8111	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.564
MX W479	8112	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.633
MX W479	8116	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	8117	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.838
MX W479	8118	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.725
MX W479	8119	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.001
MX W479	8120	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.649
MX W479	8190	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	8191	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	8192	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	8202	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.572
MX W479	8203	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.563

MX W479	8204	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.511
MX W479	8206	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	8208	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.642
MX W479	8209	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.717
MX W479	8210	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.670
MX W479	8211	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	8213	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.701
MX W479	8214	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.584
MX W479	8215	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.714
MX W479	8216	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.687
MX W479	8229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	8230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	8231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	8235	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	8238	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	8301	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.642
MX W479	8304	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	8306	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.685
MX W479	8307	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	8311	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.550
MX W479	8350	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.596
MX W479	8356	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.511
MX W479	8358	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	8360	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	8427	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.593
MX W479	8428	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.548
MX W479	8442	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	8445	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	8447	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643

MX W479	8448	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	8450	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	8451	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.695
MX W479	8452	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.533
MX W479	8514	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	8553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.944
MX W479	8567	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.619
MX W479	8570	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.535
MX W479	8571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	8595	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626
MX W479	8646	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	8660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.567
MX W479	8730	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	8734	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	8735	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.560
MX W479	8760	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** MODEL SETUP OPTIONS SUMMARY ***

** Model Options Selected:

* Model Uses Regulatory DEFAULT Options
* Model Is Setup For Calculation of Average CONCentration Values.
* NO GAS DEPOSITION Data Provided.
* NO PARTICLE DEPOSITION Data Provided.
* Model Uses NO DRY DEPLETION. DDPLETE = F
* Model Uses NO WET DEPLETION. WETDPLT = F
* Stack-tip Downwash.
* Model Accounts for ELEVated Terrain Effects.
* Use Calms Processing Routine.
* Use Missing Data Processing Routine.
* No Exponential Decay.
* Model Uses RURAL Dispersion Only.
* BULKRN - Use BULKRN Delta-T and SolarRad option for SBL in AERMET
* Model Assumes No FLAGPOLE Receptor Heights.
* The User Specified a Pollutant Type of: VOC

**Model Calculates 1 Short Term Average(s) of: 1-HR
and Calculates ANNUAL Averages

**This Run Includes: 1 Source(s); 1 Source Group(s); and 3106 Receptor(s)

with: 1 POINT(s), including

0 POINTCAP(s) and 0 POINTHOR(s)

and: 0 VOLUME source(s)

and: 0 AREA type source(s)

and: 0 LINE source(s)

and: 0 RLINE/RLINEXT source(s)

and: 0 OPENPIT source(s)

and: 0 BUOYANT LINE source(s) with a total of 0 line(s)

and: 0 SWPOINT source(s)

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 22112

**Output Options Selected:

Model Outputs Tables of ANNUAL Averages by Receptor

Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours

m for Missing Hours

b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1730.68 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0

Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07

Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 3.9 MB of RAM.

**Input Runstream File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**Output Print File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**File for Summary of Results: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***

(1=YES; 0=NO)

1 1 1

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***

(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:25:11

PAGE 3

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling Met Version: 22112

Profile file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling

Surface format: FREE

Profile format: FREE

Surface station no.: 0 Upper air station no.: 23062

Name: UNKNOWN Name: DENVER WSFO, CO

Year: 2006 Year: 2006

First 24 hours of scalar data

YR MO DY JDY HR H0 U* W* DT/DZ ZICNV ZIMCH M-O LEN Z0 BOWEN ALBEDO REF WS WD HT REF TA HT

- -

06 01 01 1 01 -26.0 0.162 -9.000 -9.000 -999. 157. 11.8 0.01 1.89 1.00 4.43 326. 10.0 280.1 2.0

06 01 01 1 02 -58.1 0.325 -9.000 -9.000 -999. 445. 42.5 0.01 1.89 1.00 6.57 310. 10.0 281.4
2.0

06 01 01 1 03 -33.0 0.292 -9.000 -9.000 -999. 380. 54.5 0.01 1.89 1.00 5.72 272. 10.0 281.0
2.0

06 01 01 1 04 -14.9 0.128 -9.000 -9.000 -999. 134. 10.2 0.01 1.89 1.00 3.67 320. 10.0 279.8
2.0

06 01 01 1 05 -13.5 0.124 -9.000 -9.000 -999. 105. 10.1 0.01 1.89 1.00 3.71 337. 10.0 279.0
2.0

06 01 01 1 06 -18.3 0.176 -9.000 -9.000 -999. 177. 21.3 0.01 1.89 1.00 4.29 344. 10.0 278.3
2.0

06 01 01 1 07 -34.9 0.286 -9.000 -9.000 -999. 367. 48.1 0.01 1.89 1.00 5.68 327. 10.0 279.3
2.0

06 01 01 1 08 -39.7 0.440 -9.000 -9.000 -999. 701. 154.4 0.01 1.89 1.00 7.96 307. 10.0 279.8
2.0

06 01 01 1 09 -17.3 0.580 -9.000 -9.000 -999. 1058. 810.0 0.01 1.89 0.43 10.10 287. 10.0 279.4
2.0

06 01 01 1 10 38.3 0.682 0.602 0.005 164. 1349. -597.0 0.01 1.89 0.31 11.67 301. 10.0 280.9
2.0

06 01 01 1 11 83.4 0.893 1.120 0.005 486. 2020. -616.6 0.01 1.89 0.26 15.29 291. 10.0 281.4
2.0

06 01 01 1 12 97.2 0.889 1.326 0.005 693. 2013. -521.8 0.01 1.89 0.24 15.20 293. 10.0 281.3
2.0

06 01 01 1 13 137.5 0.968 1.629 0.005 909. 2279. -476.9 0.01 1.89 0.24 16.54 291. 10.0
281.3 2.0

06 01 01 1 14 122.9 0.912 1.653 0.005 1063. 2100. -445.7 0.01 1.89 0.25 15.56 290. 10.0
281.0 2.0

06 01 01 1 15 67.7 0.795 1.385 0.005 1138. 1727. -536.6 0.01 1.89 0.30 13.59 295. 10.0
280.1 2.0

06 01 01 1 16 0.0 0.715 -9.000 -9.000 -999. 1464. 8888.0 0.01 1.89 0.41 12.34 301. 10.0 279.0
2.0

06 01 01 1 17 0.0 0.673 -9.000 -9.000 -999. 1330. 8888.0 0.01 1.89 0.72 11.62 304. 10.0 277.1
2.0

06 01 01 1 18 0.0 0.546 -9.000 -9.000 -999. 987. 8888.0 0.01 1.89 1.00 9.43 293. 10.0 275.9
2.0

06 01 01 1 19 -46.9 0.630 -9.000 -9.000 -999. 1199. 388.5 0.01 1.89 1.00 11.09 294. 10.0 276.2
2.0

06 01 01 1 20 -49.7 0.337 -9.000 -9.000 -999. 566. 55.9 0.01 1.89 1.00 6.57 310. 10.0 275.6
2.0

06 01 01 1 21 -29.5 0.194 -9.000 -9.000 -999. 235. 17.9 0.01 1.89 1.00 4.69 313. 10.0 274.4
2.0

06 01 01 1 22 -29.9 0.238 -9.000 -9.000 -999. 279. 32.8 0.01 1.89 1.00 5.32 338. 10.0 275.8
2.0

06 01 01 1 23 -15.8 0.134 -9.000 -9.000 -999. 123. 11.1 0.01 1.89 1.00 3.67 241. 10.0 274.5
2.0

06 01 01 1 24 -19.1 0.117 -9.000 -9.000 -999. 96. 6.1 0.01 1.89 1.00 3.98 279. 10.0 273.6
2.0

First hour of profile data

YR MO DY HR HEIGHT F WDIR WSPD AMB_TMP sigmaA sigmaW sigmaV

06 01 01 01 2.0 0 -999. -99.00 280.1 99.0 -99.00 -99.00

06 01 01 01 10.0 0 326. 4.43 282.0 5.4 -99.00 0.42

06 01 01 01 60.0 1 316. 5.10 283.1 6.1 -99.00 0.54

F indicates top of profile (=1) or below (=0)

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:25:11

PAGE 4

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF VOC IN MICROGRAMS/M**3 **

NETWORK

GROUP ID AVERAGE CONC RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

ALL 1ST HIGHEST VALUE IS 0.05988 AT (499450.00, 4508500.00, 1603.57, 1603.57, 0.00) DC

2ND HIGHEST VALUE IS 0.05857 AT (499450.00, 4508450.00, 1603.33, 1603.33, 0.00) DC

3RD HIGHEST VALUE IS 0.05815 AT (499700.00, 4508150.00, 1610.72, 1610.72, 0.00) DC

4TH HIGHEST VALUE IS 0.05704 AT (499450.00, 4508550.00, 1603.86, 1603.86, 0.00) DC

5TH HIGHEST VALUE IS 0.05646 AT (499750.00, 4508100.00, 1608.86, 1608.86, 0.00) DC

6TH HIGHEST VALUE IS 0.05573 AT (499750.00, 4508150.00, 1610.15, 1610.15, 0.00) DC

7TH HIGHEST VALUE IS 0.05544 AT (499700.00, 4508100.00, 1609.85, 1609.85, 0.00) DC

8TH HIGHEST VALUE IS 0.05515 AT (499400.00, 4508500.00, 1603.34, 1603.34, 0.00) DC

9TH HIGHEST VALUE IS 0.05489 AT (499800.00, 4508100.00, 1606.47, 1606.47, 0.00) DC

10TH HIGHEST VALUE IS 0.05396 AT (499400.00, 4508550.00, 1603.60, 1603.60, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF VOC IN MICROGRAMS/M**3 **

DATE NETWORK

GROUP ID AVERAGE CONC (YYMMDDHH) RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

- -

ALL HIGH 1ST HIGH VALUE IS 4.12346 ON 06102824: AT (499600.00, 4508200.00, 1608.71, 1608.71, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:25:11

PAGE 6

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)

A Total of 624 Warning Message(s)

A Total of 142 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 1 Calm Hours Identified

A Total of 141 Missing Hours Identified (1.61 Percent)

******** FATAL ERROR MESSAGES ********

*** NONE ***

******** WARNING MESSAGES ********

ME W181 3169 MEOPEN: BULKRN Delta-T & SolarRad option for SBL was used in AERMET

MX W403 3169 PFLCNV: Turbulence data is being used w/o ADJ_U* option SigA Data

MX W479 24 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 29 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 30 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 31 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 48 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 51 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 52 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 53 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 141 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 143 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.877

MX W479 147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 151 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479	215	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	216	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.734
MX W479	221	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.535
MX W479	222	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	243	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.588
MX W479	244	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	291	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	296	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	308	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.572
MX W479	312	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	313	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.700
MX W479	314	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.735
MX W479	317	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.795
MX W479	318	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.549
MX W479	320	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	321	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.644
MX W479	340	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	342	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	344	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561
MX W479	475	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.580
MX W479	479	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	482	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.746
MX W479	483	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	484	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	486	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	487	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.681
MX W479	488	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.697
MX W479	489	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.921

MX W479	509	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.586
MX W479	524	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	526	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	527	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	528	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.926
MX W479	529	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.676
MX W479	530	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.808
MX W479	531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.740
MX W479	532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.537
MX W479	533	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.621
MX W479	534	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.830
MX W479	535	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.510
MX W479	550	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.611
MX W479	554	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.558
MX W479	555	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	556	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.743
MX W479	573	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.536
MX W479	574	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.241
MX W479	575	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	576	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.562
MX W479	577	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	578	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.213
MX W479	579	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.698
MX W479	580	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	581	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.713
MX W479	582	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.678
MX W479	583	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.869
MX W479	584	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.806

MX W479 595 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 597 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.667

MX W479 599 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.596

MX W479 600 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 601 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.705

MX W479 605 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.665

MX W479 632 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 725 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 727 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 775 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 822 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 837 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 838 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 839 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 932 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 1029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 1031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479 1034 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 1035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 1051 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 1052 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 1053 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.884

MX W479 1054 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.859

MX W479 1055 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.766

MX W479 1056 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.677

MX W479 1060 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 1061 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.639

MX W479 1197 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 1198 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.709

MX W479 1199 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.645

MX W479 1200 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.530

MX W479 1201 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.663

MX W479 1202 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.650

MX W479 1203 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.590

MX W479 1204 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.726

MX W479 1205 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.750

MX W479 1206 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.700

MX W479 1208 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 1218 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 1219 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.824

MX W479 1220 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 1221 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.731

MX W479 1222 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 1223 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 1224 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 1225 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 1226 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.753

MX W479 1227 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.778

MX W479 1228 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 1229 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 1230 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 1231 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.753

MX W479 1243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 1244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 1245 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 1276 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 1277 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 1278 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.729

MX W479 1293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 1294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.851

MX W479 1295 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 1296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 1297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 1300 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 1301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.723

MX W479 1302 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 1303 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 1316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.692

MX W479 1343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 1344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.720

MX W479 1345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 1346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 1347 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.663

MX W479 1348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 1363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 1365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.696

MX W479 1373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 1374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1375 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.622

MX W479 1392 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 1394 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.577

MX W479 1395 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 1396 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 1397 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 1441 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 1442 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1483 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 1532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 1537 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1539 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 1540 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 1541 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 1543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 1566 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 1661 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 1989 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 1990 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 1991 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.509

MX W479 1993 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.563

MX W479 1994 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.534

MX W479 2086 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 2088 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 2089 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 2093 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 2228 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.579

MX W479 2229 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 2230 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.693

MX W479 2231 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 2232 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.632

MX W479 2234 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 2235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 2253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 2254 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 2255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.755

MX W479 2262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 2348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 2349 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2350 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 2351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2352 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.834

MX W479 2353 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 2354 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2355 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.560

MX W479 2356 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 2373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.752

MX W479 2374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 2378 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 2379 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 2380 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 2382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 2399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.920

MX W479 2421 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2422 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 2424 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 2425 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 2428 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 2429 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 2430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 2445 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2447 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.779

MX W479 2448 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 2449 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.733

MX W479 2450 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 2468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.019

MX W479 2470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.976

MX W479 2471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.882

MX W479 2472 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.650

MX W479 2542 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.826

MX W479 2544 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 2545 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.629

MX W479 2546 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.769

MX W479 2547 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.656

MX W479 2548 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.679

MX W479 2549 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.853

MX W479 2550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2615 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 2616 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 2617 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2639 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 2640 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2641 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.777

MX W479 2643 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 2645 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 2646 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 2663 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.896

MX W479 2664 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 2666 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 2669 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 2670 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 2763 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.504

MX W479 2783 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.567

MX W479 2786 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.588

MX W479 2788 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2789 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2832 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 2833 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.506

MX W479 2900 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 2901 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.673

MX W479 2902 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.730

MX W479 2903 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 2905 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.672

MX W479 2906 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.753

MX W479 2907 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 3045 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 3047 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.554

MX W479 3048 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 3148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 3149 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 3168 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 3169 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 3170 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.601

MX W479 3171 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.796

MX W479 3172 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 3173 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.889

MX W479 3174 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 3239 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 3262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 3263 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 3289 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 3290 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 3291 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 3293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 3294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.672

MX W479 3313 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 3316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 3337 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 3338 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.521

MX W479 3339 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 3363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.584

MX W479 3364 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 3365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 3366 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 3382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 3383 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 3384 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.606

MX W479 3453 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 3454 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.711

MX W479 3457 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 3509 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.654

MX W479 3525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 3671 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.541

MX W479 3674 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 3693 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 3748 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.562

MX W479 3792 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.536

MX W479 3796 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 4029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.848

MX W479 4030 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.707

MX W479 4031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 4035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 4036 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.645

MX W479 4037 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 4057 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.502

MX W479 4080 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 4101 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.545

MX W479 4102 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 4103 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.847

MX W479 4104 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 4105 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 4172 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.682

MX W479 4173 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.824

MX W479 4227 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 4297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 4298 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.590

MX W479 4301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 4493 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 4586 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 4629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.548

MX W479 4630 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 4652 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 4653 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.685

MX W479 4654 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 4656 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 4657 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.903

MX W479 4658 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.975

MX W479 4659 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.826

MX W479 4660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.741

MX W479 4661 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.888

MX W479 4677 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.524

MX W479 4679 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 4680 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.591

MX W479 4685 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.731

MX W479 4724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 4996 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.544

MX W479 5331 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.662

MX W479 5332 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 5471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 5472 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 5475 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 5614 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.669

MX W479 5615 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 5621 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 5622 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.623

MX W479 5790 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 5804 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 5805 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 5809 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 5812 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.675

MX W479 5813 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.645

MX W479 5814 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.523

MX W479 5979 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 5980 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 6120 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 6121 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 6125 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 6126 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 6142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 6146 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 6147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.573

MX W479 6148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.779

MX W479 6149 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.883

MX W479 6150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.860

MX W479 6267 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 6268 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 6271 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 6286 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 6292 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.577

MX W479 6294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.615

MX W479 6405 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 6406 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.887

MX W479 6407 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 6408 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.541

MX W479 6409 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 6410 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.740

MX W479 6411 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 6413 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 6430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479 6431 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.841

MX W479 6435 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.023

MX W479 6436 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.778

MX W479 6486 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 6501 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.822

MX W479 6524 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 6525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.600

MX W479 6526 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.566

MX W479 6528 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.612

MX W479 6529 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.627

MX W479 6530 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 6531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.662

MX W479 6532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.680

MX W479 6548 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.718

MX W479 6549 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.739

MX W479 6550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.767

MX W479 6553 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 6554 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.776

MX W479 6555 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 6556 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 6558 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.988

MX W479 6559 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.766

MX W479 6571 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.523

MX W479 6572 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.870

MX W479 6573 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.668

MX W479 6574 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.705

MX W479 6577 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.791

MX W479 6578 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 6579 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.622

MX W479 6580 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 6581 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.872

MX W479 6582 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.704

MX W479 6583 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 6596 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 6602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 6791 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.545

MX W479 6835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.564

MX W479 6836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 6868 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 6870 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 6890 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 6912 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 6913 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 6914 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.591

MX W479 6915 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 6917 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 6918 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 7014 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 7099 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.534

MX W479 7100 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.759

MX W479 7101 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7103 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 7111 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 7123 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 7126 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 7127 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 7129 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.509

MX W479 7130 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 7131 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 7132 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 7195 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.554

MX W479 7196 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 7199 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.566

MX W479 7207 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 7220 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 7243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.628

MX W479 7244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 7246 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 7252 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.629

MX W479 7253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 7255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.681

MX W479 7316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.757

MX W479 7317 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 7318 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.570

MX W479 7319 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 7321 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 7323 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 7324 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 7326 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 7340 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.691

MX W479 7343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 7345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.627

MX W479 7346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 7351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 7363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 7364 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.215

MX W479 7366 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 7367 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.612

MX W479 7368 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.799

MX W479 7369 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.518

MX W479 7388 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 7389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 7390 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 7391 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.797

MX W479 7393 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7395 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 7396 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 7397 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 7399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.656

MX W479 7400 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.686

MX W479 7446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.641

MX W479 7462 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.761

MX W479 7468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 7469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.811

MX W479 7470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.856

MX W479 7471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.803

MX W479 7484 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 7513 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 7514 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 7531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.594

MX W479 7543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 7585 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.532

MX W479 7586 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.831

MX W479 7587 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.573

MX W479 7602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 7603 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 7660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.708

MX W479 7661 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 7681 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 7682 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7683 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.707

MX W479 7684 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.628

MX W479 7753 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.641

MX W479 7755 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.502

MX W479 7794 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 7796 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.032

MX W479 7797 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.212

MX W479 7798 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.800

MX W479 7801 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.637

MX W479 7802 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.906

MX W479 7803 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 7804 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.841

MX W479 7805 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.048

MX W479 7806 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.021

MX W479 7807 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.755

MX W479 7819 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.902

MX W479 7867 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.583

MX W479 7869 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 7873 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 7878 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 7879 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 7891 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 7892 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.532

MX W479 7894 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.509

MX W479 7896 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 7897 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.506

MX W479 7898 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.761

MX W479 7899 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.773

MX W479 7900 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 7901 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.852

MX W479 7941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 7948 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 7989 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 7990 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 7991 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.627

MX W479 7992 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.622

MX W479 7993 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.288

MX W479 7994 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 7996 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.606

MX W479 8011 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 8041 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 8042 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 8062 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 8067 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 8086 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 8087 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.504

MX W479 8088 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.618

MX W479 8089 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 8090 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 8091 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.523

MX W479 8107 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 8108 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 8111 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.564

MX W479 8112 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 8116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 8117 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.838

MX W479 8118 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 8119 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.001

MX W479 8120 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.649

MX W479 8190 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 8191 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 8192 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 8202 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.572

MX W479 8203 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.563

MX W479 8204 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.511

MX W479 8206 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 8208 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.642

MX W479 8209 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.717

MX W479 8210 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.670

MX W479 8211 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 8213 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.701

MX W479 8214 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.584

MX W479 8215 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.714

MX W479 8216 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.687

MX W479 8229 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 8230 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 8231 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 8235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 8238 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 8301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.642

MX W479 8304 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 8306 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.685

MX W479 8307 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 8311 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.550

MX W479 8350 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.596

MX W479 8356 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.511

MX W479 8358 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 8360 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 8427 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.593

MX W479 8428 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.548

MX W479 8442 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.566

MX W479 8445 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 8447 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 8448 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.591

MX W479 8450 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.583

MX W479 8451 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.695

MX W479 8452 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.533

MX W479 8514 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 8553 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.944

MX W479 8567 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.619

MX W479 8570 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 8571 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.544

MX W479 8595 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.626

MX W479 8646 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 8660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.567

MX W479 8730 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 8734 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.672

MX W479 8735 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.560

MX W479 8760 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.626

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** MODEL SETUP OPTIONS SUMMARY ***

** Model Options Selected:

* Model Uses Regulatory DEFAULT Options
* Model Is Setup For Calculation of Average CONCentration Values.
* NO GAS DEPOSITION Data Provided.
* NO PARTICLE DEPOSITION Data Provided.
* Model Uses NO DRY DEPLETION. DDPLETE = F
* Model Uses NO WET DEPLETION. WETDPLT = F
* Stack-tip Downwash.
* Model Accounts for ELEVated Terrain Effects.
* Use Calms Processing Routine.
* Use Missing Data Processing Routine.
* No Exponential Decay.
* Model Uses RURAL Dispersion Only.
* BULKRN - Use BULKRN Delta-T and SolarRad option for SBL in AERMET
* Model Assumes No FLAGPOLE Receptor Heights.
* The User Specified a Pollutant Type of: ACETALDE

**Model Calculates 1 Short Term Average(s) of: 1-HR
and Calculates ANNUAL Averages

**This Run Includes: 1 Source(s); 1 Source Group(s); and 3106 Receptor(s)

with: 1 POINT(s), including

0 POINTCAP(s) and 0 POINTHOR(s)

and: 0 VOLUME source(s)

and: 0 AREA type source(s)

and: 0 LINE source(s)

and: 0 RLINE/RLINEXT source(s)

and: 0 OPENPIT source(s)

and: 0 BUOYANT LINE source(s) with a total of 0 line(s)

and: 0 SWPOINT source(s)

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 22112

**Output Options Selected:

Model Outputs Tables of ANNUAL Averages by Receptor

Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours

m for Missing Hours

b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1730.68 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0

Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07

Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 3.9 MB of RAM.

**Input Runstream File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**Output Print File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**File for Summary of Results: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***

(1=YES; 0=NO)

1 1 1

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***

(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling
Met Version: 22112

Profile file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling

Surface format: FREE

Profile format: FREE

Surface station no.: 0 Upper air station no.: 23062

Name: UNKNOWN Name: DENVER WSFO, CO

Year: 2006 Year: 2006

First 24 hours of scalar data

YR MO DY JDY HR H0 U* W* DT/DZ ZICNV ZIMCH M-O LEN Z0 BOWEN ALBEDO REF WS WD HT REF TA HT

- -

06 01 01 1 01 -26.0 0.162 -9.000 -9.000 -999. 157. 11.8 0.01 1.89 1.00 4.43 326. 10.0 280.1 2.0

06 01 01 1 02 -58.1 0.325 -9.000 -9.000 -999. 445. 42.5 0.01 1.89 1.00 6.57 310. 10.0 281.4
2.0

06 01 01 1 03 -33.0 0.292 -9.000 -9.000 -999. 380. 54.5 0.01 1.89 1.00 5.72 272. 10.0 281.0
2.0

06 01 01 1 04 -14.9 0.128 -9.000 -9.000 -999. 134. 10.2 0.01 1.89 1.00 3.67 320. 10.0 279.8
2.0

06 01 01 1 05 -13.5 0.124 -9.000 -9.000 -999. 105. 10.1 0.01 1.89 1.00 3.71 337. 10.0 279.0
2.0

06 01 01 1 06 -18.3 0.176 -9.000 -9.000 -999. 177. 21.3 0.01 1.89 1.00 4.29 344. 10.0 278.3
2.0

06 01 01 1 07 -34.9 0.286 -9.000 -9.000 -999. 367. 48.1 0.01 1.89 1.00 5.68 327. 10.0 279.3
2.0

06 01 01 1 08 -39.7 0.440 -9.000 -9.000 -999. 701. 154.4 0.01 1.89 1.00 7.96 307. 10.0 279.8
2.0

06 01 01 1 09 -17.3 0.580 -9.000 -9.000 -999. 1058. 810.0 0.01 1.89 0.43 10.10 287. 10.0 279.4
2.0

06 01 01 1 10 38.3 0.682 0.602 0.005 164. 1349. -597.0 0.01 1.89 0.31 11.67 301. 10.0 280.9
2.0

06 01 01 1 11 83.4 0.893 1.120 0.005 486. 2020. -616.6 0.01 1.89 0.26 15.29 291. 10.0 281.4
2.0

06 01 01 1 12 97.2 0.889 1.326 0.005 693. 2013. -521.8 0.01 1.89 0.24 15.20 293. 10.0 281.3
2.0

06 01 01 1 13 137.5 0.968 1.629 0.005 909. 2279. -476.9 0.01 1.89 0.24 16.54 291. 10.0
281.3 2.0

06 01 01 1 14 122.9 0.912 1.653 0.005 1063. 2100. -445.7 0.01 1.89 0.25 15.56 290. 10.0
281.0 2.0

06 01 01 1 15 67.7 0.795 1.385 0.005 1138. 1727. -536.6 0.01 1.89 0.30 13.59 295. 10.0
280.1 2.0

06 01 01 1 16 0.0 0.715 -9.000 -9.000 -999. 1464. 8888.0 0.01 1.89 0.41 12.34 301. 10.0 279.0
2.0

06 01 01 1 17 0.0 0.673 -9.000 -9.000 -999. 1330. 8888.0 0.01 1.89 0.72 11.62 304. 10.0 277.1
2.0

06 01 01 1 18 0.0 0.546 -9.000 -9.000 -999. 987. 8888.0 0.01 1.89 1.00 9.43 293. 10.0 275.9
2.0

06 01 01 1 19 -46.9 0.630 -9.000 -9.000 -999. 1199. 388.5 0.01 1.89 1.00 11.09 294. 10.0 276.2
2.0

06 01 01 1 20 -49.7 0.337 -9.000 -9.000 -999. 566. 55.9 0.01 1.89 1.00 6.57 310. 10.0 275.6
2.0

06 01 01 1 21 -29.5 0.194 -9.000 -9.000 -999. 235. 17.9 0.01 1.89 1.00 4.69 313. 10.0 274.4
2.0

06 01 01 1 22 -29.9 0.238 -9.000 -9.000 -999. 279. 32.8 0.01 1.89 1.00 5.32 338. 10.0 275.8
2.0

06 01 01 1 23 -15.8 0.134 -9.000 -9.000 -999. 123. 11.1 0.01 1.89 1.00 3.67 241. 10.0 274.5
2.0

06 01 01 1 24 -19.1 0.117 -9.000 -9.000 -999. 96. 6.1 0.01 1.89 1.00 3.98 279. 10.0 273.6
2.0

First hour of profile data

YR MO DY HR HEIGHT F WDIR WSPD AMB_TMP sigmaA sigmaW sigmaV

06 01 01 01 2.0 0 -999. -99.00 280.1 99.0 -99.00 -99.00

06 01 01 01 10.0 0 326. 4.43 282.0 5.4 -99.00 0.42

06 01 01 01 60.0 1 316. 5.10 283.1 6.1 -99.00 0.54

F indicates top of profile (=1) or below (=0)

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:18:18

PAGE 4

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF ACETALDE IN MICROGRAMS/M**3 **

NETWORK

GROUP ID AVERAGE CONC RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

- -

ALL 1ST HIGHEST VALUE IS 0.00243 AT (499450.00, 4508500.00, 1603.57, 1603.57, 0.00) DC

2ND HIGHEST VALUE IS 0.00238 AT (499450.00, 4508450.00, 1603.33, 1603.33, 0.00) DC

3RD HIGHEST VALUE IS 0.00236 AT (499700.00, 4508150.00, 1610.72, 1610.72, 0.00) DC

4TH HIGHEST VALUE IS 0.00232 AT (499450.00, 4508550.00, 1603.86, 1603.86, 0.00) DC

5TH HIGHEST VALUE IS 0.00229 AT (499750.00, 4508100.00, 1608.86, 1608.86, 0.00) DC

6TH HIGHEST VALUE IS 0.00226 AT (499750.00, 4508150.00, 1610.15, 1610.15, 0.00) DC

7TH HIGHEST VALUE IS 0.00225 AT (499700.00, 4508100.00, 1609.85, 1609.85, 0.00) DC

8TH HIGHEST VALUE IS 0.00224 AT (499400.00, 4508500.00, 1603.34, 1603.34, 0.00) DC

9TH HIGHEST VALUE IS 0.00223 AT (499800.00, 4508100.00, 1606.47, 1606.47, 0.00) DC

10TH HIGHEST VALUE IS 0.00219 AT (499400.00, 4508550.00, 1603.60, 1603.60, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF ACETALDE IN MICROGRAMS/M**3 **

DATE NETWORK

GROUP ID AVERAGE CONC (YYMMDDHH) RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

- -

ALL HIGH 1ST HIGH VALUE IS 0.16752 ON 06102824: AT (499600.00, 4508200.00, 1608.71, 1608.71, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:18:18

PAGE 6

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)

A Total of 624 Warning Message(s)

A Total of 142 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 1 Calm Hours Identified

A Total of 141 Missing Hours Identified (1.61 Percent)

******** FATAL ERROR MESSAGES ********

*** NONE ***

******** WARNING MESSAGES ********

ME W181 3169 MEOPEN: BULKRN Delta-T & SolarRad option for SBL was used in AERMET

MX W403 3169 PFLCNV: Turbulence data is being used w/o ADJ_U* option SigA Data

MX W479 24 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 29 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 30 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 31 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 48 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 51 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 52 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 53 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 141 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 143 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.877

MX W479 147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 151 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 215 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 216 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 221 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 222 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.588

MX W479 244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 291 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.544

MX W479 296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 308 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.572

MX W479 312 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 313 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.700

MX W479 314 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 317 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.795

MX W479 318 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 320 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 321 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 340 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 342 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 475 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.580

MX W479 479 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 482 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.746

MX W479 483 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 484 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 486 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 487 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.681

MX W479 488 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.697

MX W479 489 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.921

MX W479 509 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 524 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 526 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 527 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 528 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.926

MX W479 529 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.676

MX W479 530 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.808

MX W479 531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.740

MX W479 532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.537

MX W479 533 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.621

MX W479 534 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.830

MX W479 535 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 554 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 555 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 556 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 573 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.536

MX W479 574 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.241

MX W479 575 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 576 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.562

MX W479 577 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 578 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.213

MX W479 579 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 580 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 581 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.713

MX W479 582 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.678

MX W479 583 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.869

MX W479 584 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 595 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 597 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.667

MX W479 599 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.596

MX W479 600 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 601 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.705

MX W479 605 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.665

MX W479 632 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 725 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 727 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 775 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 822 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 837 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 838 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 839 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 932 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 1029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 1031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479 1034 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 1035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 1051 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 1052 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 1053 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.884

MX W479 1054 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.859

MX W479	1055	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.766
MX W479	1056	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.677
MX W479	1060	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	1061	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.639
MX W479	1197	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	1198	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.709
MX W479	1199	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	1200	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.530
MX W479	1201	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.663
MX W479	1202	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.650
MX W479	1203	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.590
MX W479	1204	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.726
MX W479	1205	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.750
MX W479	1206	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.700
MX W479	1208	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	1218	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	1219	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.824
MX W479	1220	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	1221	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.731
MX W479	1222	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	1223	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	1224	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	1225	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	1226	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753
MX W479	1227	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	1228	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	1229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602
MX W479	1230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	1231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753

MX W479 1243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 1244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 1245 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 1276 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 1277 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 1278 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.729

MX W479 1293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 1294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.851

MX W479 1295 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 1296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 1297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 1300 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 1301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.723

MX W479 1302 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 1303 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 1316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.692

MX W479 1343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 1344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.720

MX W479 1345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 1346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 1347 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.663

MX W479 1348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 1363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 1365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.696

MX W479 1373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 1374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1375 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.622

MX W479 1392 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 1394 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.577

MX W479 1395 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 1396 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 1397 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 1441 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 1442 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1483 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 1532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 1537 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1539 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 1540 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 1541 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 1543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 1566 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 1661 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 1989 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 1990 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 1991 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.509

MX W479 1993 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.563

MX W479 1994 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.534

MX W479 2086 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 2088 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 2089 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 2093 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 2228 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.579

MX W479 2229 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 2230 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.693

MX W479 2231 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 2232 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.632

MX W479 2234 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 2235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 2253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 2254 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 2255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.755

MX W479 2262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 2348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 2349 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2350 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 2351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2352 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.834

MX W479 2353 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 2354 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2355 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.560

MX W479 2356 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 2373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.752

MX W479 2374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 2378 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 2379 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 2380 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 2382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 2399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.920

MX W479 2421 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2422 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 2424 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 2425 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 2428 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 2429 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479	2430	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	2445	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.748
MX W479	2446	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614
MX W479	2447	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.779
MX W479	2448	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.743
MX W479	2449	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.733
MX W479	2450	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	2468	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.568
MX W479	2469	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.019
MX W479	2470	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.976
MX W479	2471	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.882
MX W479	2472	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.650
MX W479	2542	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.620
MX W479	2543	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.826
MX W479	2544	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.734
MX W479	2545	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.629
MX W479	2546	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.769
MX W479	2547	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.656
MX W479	2548	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.679
MX W479	2549	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.853
MX W479	2550	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	2615	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	2616	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	2617	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614
MX W479	2639	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	2640	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	2641	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.777
MX W479	2643	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.648
MX W479	2645	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602

MX W479	2646	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	2660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	2663	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.896
MX W479	2664	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	2666	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	2669	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	2670	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.500
MX W479	2763	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.504
MX W479	2783	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.567
MX W479	2786	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.588
MX W479	2788	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.748
MX W479	2789	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	2832	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.501
MX W479	2833	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.506
MX W479	2900	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	2901	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.673
MX W479	2902	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.730
MX W479	2903	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	2905	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	2906	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753
MX W479	2907	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	3045	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.549
MX W479	3047	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.554
MX W479	3048	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	3148	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	3149	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	3168	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	3169	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	3170	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.601

MX W479	3171	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.796
MX W479	3172	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	3173	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.889
MX W479	3174	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	3239	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	3262	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.633
MX W479	3263	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	3289	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.546
MX W479	3290	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.586
MX W479	3291	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.607
MX W479	3293	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	3294	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	3313	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	3316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.595
MX W479	3337	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	3338	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.521
MX W479	3339	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	3363	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.584
MX W479	3364	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	3365	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	3366	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.576
MX W479	3382	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.620
MX W479	3383	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.727
MX W479	3384	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.606
MX W479	3453	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.648
MX W479	3454	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.711
MX W479	3457	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	3509	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.654
MX W479	3525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614

MX W479	3671	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.541
MX W479	3674	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	3693	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	3748	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.562
MX W479	3792	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.536
MX W479	3796	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.568
MX W479	4029	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.848
MX W479	4030	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.707
MX W479	4031	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	4035	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	4036	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	4037	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	4057	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.502
MX W479	4080	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	4101	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.545
MX W479	4102	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	4103	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.847
MX W479	4104	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.608
MX W479	4105	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	4172	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.682
MX W479	4173	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.824
MX W479	4227	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	4297	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	4298	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.590
MX W479	4301	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.582
MX W479	4493	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.603
MX W479	4586	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	4629	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.548
MX W479	4630	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.517

MX W479	4652	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.510
MX W479	4653	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.685
MX W479	4654	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	4656	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	4657	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.903
MX W479	4658	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.975
MX W479	4659	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.826
MX W479	4660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.741
MX W479	4661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.888
MX W479	4677	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.524
MX W479	4679	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	4680	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	4685	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.731
MX W479	4724	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	4996	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	5331	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.662
MX W479	5332	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561
MX W479	5471	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	5472	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	5475	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	5614	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.669
MX W479	5615	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.549
MX W479	5621	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.557
MX W479	5622	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.623
MX W479	5790	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.581
MX W479	5804	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	5805	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	5809	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	5812	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.675

MX W479	5813	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	5814	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	5979	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	5980	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.546
MX W479	6120	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	6121	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.501
MX W479	6125	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	6126	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	6142	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	6146	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.582
MX W479	6147	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.573
MX W479	6148	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.779
MX W479	6149	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.883
MX W479	6150	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.860
MX W479	6267	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.540
MX W479	6268	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	6271	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.529
MX W479	6286	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.595
MX W479	6292	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.577
MX W479	6294	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.615
MX W479	6405	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.611
MX W479	6406	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.887
MX W479	6407	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	6408	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.541
MX W479	6409	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	6410	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.740
MX W479	6411	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	6413	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	6430	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.587

MX W479 6431 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.841

MX W479 6435 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.023

MX W479 6436 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.778

MX W479 6486 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 6501 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.822

MX W479 6524 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 6525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.600

MX W479 6526 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.566

MX W479 6528 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.612

MX W479 6529 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.627

MX W479 6530 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 6531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.662

MX W479 6532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.680

MX W479 6548 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.718

MX W479 6549 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.739

MX W479 6550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.767

MX W479 6553 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 6554 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.776

MX W479 6555 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 6556 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 6558 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.988

MX W479 6559 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.766

MX W479 6571 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.523

MX W479 6572 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.870

MX W479 6573 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.668

MX W479 6574 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.705

MX W479 6577 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.791

MX W479 6578 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 6579 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.622

MX W479	6580	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	6581	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.872
MX W479	6582	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.704
MX W479	6583	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	6596	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	6602	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	6791	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.545
MX W479	6835	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.564
MX W479	6836	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	6868	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	6870	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.516
MX W479	6890	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	6912	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.576
MX W479	6913	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	6914	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	6915	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	6917	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	6918	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	7014	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7099	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.534
MX W479	7100	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.759
MX W479	7101	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7103	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	7111	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	7123	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	7126	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.603
MX W479	7127	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	7129	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	7130	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.683

MX W479 7131 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 7132 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 7195 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.554

MX W479 7196 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 7199 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.566

MX W479 7207 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 7220 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 7243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.628

MX W479 7244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 7246 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 7252 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.629

MX W479 7253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 7255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.681

MX W479 7316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.757

MX W479 7317 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 7318 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.570

MX W479 7319 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 7321 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 7323 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 7324 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 7326 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 7340 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.691

MX W479 7343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 7345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.627

MX W479 7346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 7351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 7363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 7364 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.215

MX W479 7366 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479	7367	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.612
MX W479	7368	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.799
MX W479	7369	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.518
MX W479	7388	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	7389	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	7390	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.725
MX W479	7391	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.797
MX W479	7393	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7395	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	7396	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	7397	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	7399	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.656
MX W479	7400	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.686
MX W479	7446	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.641
MX W479	7462	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.761
MX W479	7468	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	7469	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.811
MX W479	7470	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.856
MX W479	7471	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.803
MX W479	7484	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.540
MX W479	7513	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.558
MX W479	7514	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.585
MX W479	7531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.594
MX W479	7543	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	7585	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.532
MX W479	7586	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.831
MX W479	7587	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.573
MX W479	7602	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.586
MX W479	7603	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561

MX W479	7660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.708
MX W479	7661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7681	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	7682	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7683	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.707
MX W479	7684	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.628
MX W479	7753	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.641
MX W479	7755	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.502
MX W479	7794	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.607
MX W479	7796	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.032
MX W479	7797	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.212
MX W479	7798	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.800
MX W479	7801	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.637
MX W479	7802	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.906
MX W479	7803	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	7804	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	7805	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.048
MX W479	7806	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.021
MX W479	7807	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.755
MX W479	7819	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.902
MX W479	7867	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	7869	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	7873	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	7878	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	7879	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	7891	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	7892	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.532
MX W479	7894	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	7896	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556

MX W479	7897	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.506
MX W479	7898	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.761
MX W479	7899	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.773
MX W479	7900	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	7901	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.852
MX W479	7941	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	7948	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7989	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.671
MX W479	7990	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	7991	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	7992	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.622
MX W479	7993	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.288
MX W479	7994	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.608
MX W479	7996	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.606
MX W479	8011	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	8041	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.505
MX W479	8042	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	8062	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	8067	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	8086	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.668
MX W479	8087	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.504
MX W479	8088	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.618
MX W479	8089	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	8090	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.585
MX W479	8091	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	8107	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.613
MX W479	8108	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	8111	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.564
MX W479	8112	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.633

MX W479	8116	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	8117	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.838
MX W479	8118	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.725
MX W479	8119	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.001
MX W479	8120	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.649
MX W479	8190	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	8191	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	8192	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	8202	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.572
MX W479	8203	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.563
MX W479	8204	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.511
MX W479	8206	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	8208	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.642
MX W479	8209	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.717
MX W479	8210	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.670
MX W479	8211	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	8213	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.701
MX W479	8214	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.584
MX W479	8215	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.714
MX W479	8216	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.687
MX W479	8229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	8230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	8231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	8235	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	8238	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	8301	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.642
MX W479	8304	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	8306	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.685
MX W479	8307	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574

MX W479	8311	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.550
MX W479	8350	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.596
MX W479	8356	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.511
MX W479	8358	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	8360	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	8427	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.593
MX W479	8428	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.548
MX W479	8442	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	8445	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	8447	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	8448	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	8450	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	8451	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.695
MX W479	8452	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.533
MX W479	8514	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	8553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.944
MX W479	8567	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.619
MX W479	8570	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.535
MX W479	8571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	8595	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626
MX W479	8646	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	8660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.567
MX W479	8730	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	8734	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	8735	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.560
MX W479	8760	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** MODEL SETUP OPTIONS SUMMARY ***

** Model Options Selected:

* Model Uses Regulatory DEFAULT Options
* Model Is Setup For Calculation of Average CONCentration Values.
* NO GAS DEPOSITION Data Provided.
* NO PARTICLE DEPOSITION Data Provided.
* Model Uses NO DRY DEPLETION. DDPLETE = F
* Model Uses NO WET DEPLETION. WETDPLT = F
* Stack-tip Downwash.
* Model Accounts for ELEVated Terrain Effects.
* Use Calms Processing Routine.
* Use Missing Data Processing Routine.
* No Exponential Decay.
* Model Uses RURAL Dispersion Only.
* BULKRN - Use BULKRN Delta-T and SolarRad option for SBL in AERMET
* Model Assumes No FLAGPOLE Receptor Heights.
* The User Specified a Pollutant Type of: HEXANE

**Model Calculates 1 Short Term Average(s) of: 1-HR
and Calculates ANNUAL Averages

**This Run Includes: 1 Source(s); 1 Source Group(s); and 3106 Receptor(s)

with: 1 POINT(s), including

0 POINTCAP(s) and 0 POINTHOR(s)

and: 0 VOLUME source(s)

and: 0 AREA type source(s)

and: 0 LINE source(s)

and: 0 RLINE/RLINEXT source(s)

and: 0 OPENPIT source(s)

and: 0 BUOYANT LINE source(s) with a total of 0 line(s)

and: 0 SWPOINT source(s)

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 22112

**Output Options Selected:

Model Outputs Tables of ANNUAL Averages by Receptor

Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours

m for Missing Hours

b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1730.68 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0

Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07

Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 3.9 MB of RAM.

**Input Runstream File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**Output Print File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**File for Summary of Results: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***

(1=YES; 0=NO)

1 1 1

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***

(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling
Met Version: 22112

Profile file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling

Surface format: FREE

Profile format: FREE

Surface station no.: 0 Upper air station no.: 23062

Name: UNKNOWN Name: DENVER WSFO, CO

Year: 2006 Year: 2006

First 24 hours of scalar data

YR MO DY JDY HR H0 U* W* DT/DZ ZICNV ZIMCH M-O LEN Z0 BOWEN ALBEDO REF WS WD HT REF TA HT

- -

06 01 01 1 01 -26.0 0.162 -9.000 -9.000 -999. 157. 11.8 0.01 1.89 1.00 4.43 326. 10.0 280.1 2.0

06 01 01 1 02 -58.1 0.325 -9.000 -9.000 -999. 445. 42.5 0.01 1.89 1.00 6.57 310. 10.0 281.4
2.0

06 01 01 1 03 -33.0 0.292 -9.000 -9.000 -999. 380. 54.5 0.01 1.89 1.00 5.72 272. 10.0 281.0
2.0

06 01 01 1 04 -14.9 0.128 -9.000 -9.000 -999. 134. 10.2 0.01 1.89 1.00 3.67 320. 10.0 279.8
2.0

06 01 01 1 05 -13.5 0.124 -9.000 -9.000 -999. 105. 10.1 0.01 1.89 1.00 3.71 337. 10.0 279.0
2.0

06 01 01 1 06 -18.3 0.176 -9.000 -9.000 -999. 177. 21.3 0.01 1.89 1.00 4.29 344. 10.0 278.3
2.0

06 01 01 1 07 -34.9 0.286 -9.000 -9.000 -999. 367. 48.1 0.01 1.89 1.00 5.68 327. 10.0 279.3
2.0

06 01 01 1 08 -39.7 0.440 -9.000 -9.000 -999. 701. 154.4 0.01 1.89 1.00 7.96 307. 10.0 279.8
2.0

06 01 01 1 09 -17.3 0.580 -9.000 -9.000 -999. 1058. 810.0 0.01 1.89 0.43 10.10 287. 10.0 279.4
2.0

06 01 01 1 10 38.3 0.682 0.602 0.005 164. 1349. -597.0 0.01 1.89 0.31 11.67 301. 10.0 280.9
2.0

06 01 01 1 11 83.4 0.893 1.120 0.005 486. 2020. -616.6 0.01 1.89 0.26 15.29 291. 10.0 281.4
2.0

06 01 01 1 12 97.2 0.889 1.326 0.005 693. 2013. -521.8 0.01 1.89 0.24 15.20 293. 10.0 281.3
2.0

06 01 01 1 13 137.5 0.968 1.629 0.005 909. 2279. -476.9 0.01 1.89 0.24 16.54 291. 10.0
281.3 2.0

06 01 01 1 14 122.9 0.912 1.653 0.005 1063. 2100. -445.7 0.01 1.89 0.25 15.56 290. 10.0
281.0 2.0

06 01 01 1 15 67.7 0.795 1.385 0.005 1138. 1727. -536.6 0.01 1.89 0.30 13.59 295. 10.0
280.1 2.0

06 01 01 1 16 0.0 0.715 -9.000 -9.000 -999. 1464. 8888.0 0.01 1.89 0.41 12.34 301. 10.0 279.0
2.0

06 01 01 1 17 0.0 0.673 -9.000 -9.000 -999. 1330. 8888.0 0.01 1.89 0.72 11.62 304. 10.0 277.1
2.0

06 01 01 1 18 0.0 0.546 -9.000 -9.000 -999. 987. 8888.0 0.01 1.89 1.00 9.43 293. 10.0 275.9
2.0

06 01 01 1 19 -46.9 0.630 -9.000 -9.000 -999. 1199. 388.5 0.01 1.89 1.00 11.09 294. 10.0 276.2
2.0

06 01 01 1 20 -49.7 0.337 -9.000 -9.000 -999. 566. 55.9 0.01 1.89 1.00 6.57 310. 10.0 275.6
2.0

06 01 01 1 21 -29.5 0.194 -9.000 -9.000 -999. 235. 17.9 0.01 1.89 1.00 4.69 313. 10.0 274.4
2.0

06 01 01 1 22 -29.9 0.238 -9.000 -9.000 -999. 279. 32.8 0.01 1.89 1.00 5.32 338. 10.0 275.8
2.0

06 01 01 1 23 -15.8 0.134 -9.000 -9.000 -999. 123. 11.1 0.01 1.89 1.00 3.67 241. 10.0 274.5
2.0

06 01 01 1 24 -19.1 0.117 -9.000 -9.000 -999. 96. 6.1 0.01 1.89 1.00 3.98 279. 10.0 273.6
2.0

First hour of profile data

YR MO DY HR HEIGHT F WDIR WSPD AMB_TMP sigmaA sigmaW sigmaV

06 01 01 01 2.0 0 -999. -99.00 280.1 99.0 -99.00 -99.00

06 01 01 01 10.0 0 326. 4.43 282.0 5.4 -99.00 0.42

06 01 01 01 60.0 1 316. 5.10 283.1 6.1 -99.00 0.54

F indicates top of profile (=1) or below (=0)

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF HEXANE IN MICROGRAMS/M**3 **

NETWORK

GROUP ID AVERAGE CONC RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

ALL 1ST HIGHEST VALUE IS 0.00172 AT (499450.00, 4508500.00, 1603.57, 1603.57, 0.00) DC

2ND HIGHEST VALUE IS 0.00168 AT (499450.00, 4508450.00, 1603.33, 1603.33, 0.00) DC

3RD HIGHEST VALUE IS 0.00167 AT (499700.00, 4508150.00, 1610.72, 1610.72, 0.00) DC

4TH HIGHEST VALUE IS 0.00164 AT (499450.00, 4508550.00, 1603.86, 1603.86, 0.00) DC

5TH HIGHEST VALUE IS 0.00162 AT (499750.00, 4508100.00, 1608.86, 1608.86, 0.00) DC

6TH HIGHEST VALUE IS 0.00160 AT (499750.00, 4508150.00, 1610.15, 1610.15, 0.00) DC

7TH HIGHEST VALUE IS 0.00159 AT (499700.00, 4508100.00, 1609.85, 1609.85, 0.00) DC

8TH HIGHEST VALUE IS 0.00159 AT (499400.00, 4508500.00, 1603.34, 1603.34, 0.00) DC

9TH HIGHEST VALUE IS 0.00158 AT (499800.00, 4508100.00, 1606.47, 1606.47, 0.00) DC

10TH HIGHEST VALUE IS 0.00155 AT (499400.00, 4508550.00, 1603.60, 1603.60, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF HEXANE IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	NETWORK RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

ALL HIGH 1ST HIGH VALUE IS 0.11855 ON 06102824: AT (499600.00, 4508200.00, 1608.71, 1608.71, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)

A Total of 624 Warning Message(s)

A Total of 142 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 1 Calm Hours Identified

A Total of 141 Missing Hours Identified (1.61 Percent)

******** FATAL ERROR MESSAGES ********

*** NONE ***

******** WARNING MESSAGES ********

ME W181 3169 MEOPEN: BULKRN Delta-T & SolarRad option for SBL was used in AERMET

MX W403 3169 PFLCNV: Turbulence data is being used w/o ADJ_U* option SigA Data

MX W479 24 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 29 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 30 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 31 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 48 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 51 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 52 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 53 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 141 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 143 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.877

MX W479 147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 151 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 215 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 216 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 221 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 222 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.588

MX W479 244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 291 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.544

MX W479 296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 308 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.572

MX W479 312 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 313 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.700

MX W479 314 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 317 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.795

MX W479 318 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 320 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 321 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 340 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 342 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 475 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.580

MX W479 479 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 482 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.746

MX W479 483 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 484 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 486 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 487 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.681

MX W479 488 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.697

MX W479 489 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.921

MX W479 509 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 524 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 526 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 527 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 528 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.926

MX W479 529 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.676

MX W479 530 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.808

MX W479 531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.740

MX W479 532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.537

MX W479 533 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.621

MX W479 534 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.830

MX W479 535 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 554 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 555 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 556 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 573 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.536

MX W479 574 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.241

MX W479 575 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 576 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.562

MX W479 577 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 578 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.213

MX W479 579 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 580 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 581 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.713

MX W479 582 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.678

MX W479 583 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.869

MX W479 584 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 595 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 597 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.667

MX W479 599 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.596

MX W479 600 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 601 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.705

MX W479 605 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.665

MX W479 632 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 725 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 727 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 775 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 822 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 837 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 838 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 839 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 932 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 1029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 1031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479 1034 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 1035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 1051 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 1052 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 1053 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.884

MX W479 1054 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.859

MX W479	1055	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.766
MX W479	1056	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.677
MX W479	1060	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	1061	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.639
MX W479	1197	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	1198	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.709
MX W479	1199	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	1200	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.530
MX W479	1201	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.663
MX W479	1202	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.650
MX W479	1203	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.590
MX W479	1204	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.726
MX W479	1205	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.750
MX W479	1206	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.700
MX W479	1208	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	1218	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	1219	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.824
MX W479	1220	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	1221	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.731
MX W479	1222	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	1223	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	1224	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	1225	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	1226	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753
MX W479	1227	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	1228	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	1229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602
MX W479	1230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	1231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753

MX W479 1243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 1244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 1245 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 1276 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 1277 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 1278 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.729

MX W479 1293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 1294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.851

MX W479 1295 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 1296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 1297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 1300 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 1301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.723

MX W479 1302 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 1303 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 1316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.692

MX W479 1343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 1344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.720

MX W479 1345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 1346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 1347 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.663

MX W479 1348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 1363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 1365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.696

MX W479 1373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 1374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1375 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.622

MX W479 1392 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 1394 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.577

MX W479 1395 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 1396 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 1397 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 1441 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 1442 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1483 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 1532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 1537 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1539 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 1540 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 1541 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 1543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 1566 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 1661 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 1989 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 1990 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 1991 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.509

MX W479 1993 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.563

MX W479 1994 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.534

MX W479 2086 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 2088 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 2089 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 2093 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 2228 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.579

MX W479 2229 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 2230 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.693

MX W479 2231 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 2232 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.632

MX W479 2234 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 2235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 2253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 2254 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 2255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.755

MX W479 2262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 2348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 2349 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2350 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 2351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2352 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.834

MX W479 2353 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 2354 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2355 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.560

MX W479 2356 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 2373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.752

MX W479 2374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 2378 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 2379 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 2380 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 2382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 2399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.920

MX W479 2421 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2422 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 2424 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 2425 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 2428 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 2429 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479	2430	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	2445	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.748
MX W479	2446	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614
MX W479	2447	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.779
MX W479	2448	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.743
MX W479	2449	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.733
MX W479	2450	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	2468	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.568
MX W479	2469	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.019
MX W479	2470	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.976
MX W479	2471	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.882
MX W479	2472	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.650
MX W479	2542	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.620
MX W479	2543	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.826
MX W479	2544	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.734
MX W479	2545	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.629
MX W479	2546	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.769
MX W479	2547	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.656
MX W479	2548	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.679
MX W479	2549	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.853
MX W479	2550	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	2615	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	2616	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	2617	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614
MX W479	2639	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	2640	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	2641	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.777
MX W479	2643	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.648
MX W479	2645	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602

MX W479 2646 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 2663 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.896

MX W479 2664 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 2666 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 2669 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 2670 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 2763 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.504

MX W479 2783 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.567

MX W479 2786 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.588

MX W479 2788 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2789 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2832 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 2833 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.506

MX W479 2900 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 2901 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.673

MX W479 2902 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.730

MX W479 2903 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 2905 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.672

MX W479 2906 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.753

MX W479 2907 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 3045 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 3047 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.554

MX W479 3048 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 3148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 3149 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 3168 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 3169 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 3170 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.601

MX W479 3171 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.796

MX W479 3172 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 3173 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.889

MX W479 3174 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 3239 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 3262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 3263 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 3289 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 3290 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 3291 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 3293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 3294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.672

MX W479 3313 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 3316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 3337 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 3338 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.521

MX W479 3339 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 3363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.584

MX W479 3364 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 3365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 3366 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 3382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 3383 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 3384 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.606

MX W479 3453 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 3454 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.711

MX W479 3457 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 3509 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.654

MX W479 3525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479	3671	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.541
MX W479	3674	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	3693	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	3748	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.562
MX W479	3792	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.536
MX W479	3796	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.568
MX W479	4029	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.848
MX W479	4030	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.707
MX W479	4031	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	4035	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	4036	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	4037	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	4057	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.502
MX W479	4080	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	4101	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.545
MX W479	4102	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	4103	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.847
MX W479	4104	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.608
MX W479	4105	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	4172	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.682
MX W479	4173	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.824
MX W479	4227	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	4297	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	4298	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.590
MX W479	4301	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.582
MX W479	4493	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.603
MX W479	4586	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	4629	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.548
MX W479	4630	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.517

MX W479	4652	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.510
MX W479	4653	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.685
MX W479	4654	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	4656	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	4657	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.903
MX W479	4658	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.975
MX W479	4659	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.826
MX W479	4660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.741
MX W479	4661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.888
MX W479	4677	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.524
MX W479	4679	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	4680	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	4685	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.731
MX W479	4724	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	4996	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	5331	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.662
MX W479	5332	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561
MX W479	5471	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	5472	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	5475	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	5614	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.669
MX W479	5615	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.549
MX W479	5621	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.557
MX W479	5622	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.623
MX W479	5790	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.581
MX W479	5804	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	5805	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	5809	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	5812	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.675

MX W479	5813	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	5814	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	5979	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	5980	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.546
MX W479	6120	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	6121	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.501
MX W479	6125	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	6126	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	6142	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	6146	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.582
MX W479	6147	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.573
MX W479	6148	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.779
MX W479	6149	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.883
MX W479	6150	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.860
MX W479	6267	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.540
MX W479	6268	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	6271	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.529
MX W479	6286	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.595
MX W479	6292	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.577
MX W479	6294	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.615
MX W479	6405	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.611
MX W479	6406	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.887
MX W479	6407	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	6408	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.541
MX W479	6409	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	6410	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.740
MX W479	6411	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	6413	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	6430	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.587

MX W479	6431	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	6435	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.023
MX W479	6436	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	6486	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	6501	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.822
MX W479	6524	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.557
MX W479	6525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.600
MX W479	6526	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	6528	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.612
MX W479	6529	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	6530	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	6531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.662
MX W479	6532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.680
MX W479	6548	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.718
MX W479	6549	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.739
MX W479	6550	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.767
MX W479	6553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.592
MX W479	6554	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.776
MX W479	6555	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.581
MX W479	6556	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	6558	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.988
MX W479	6559	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.766
MX W479	6571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	6572	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.870
MX W479	6573	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.668
MX W479	6574	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.705
MX W479	6577	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.791
MX W479	6578	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	6579	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.622

MX W479	6580	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	6581	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.872
MX W479	6582	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.704
MX W479	6583	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	6596	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	6602	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	6791	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.545
MX W479	6835	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.564
MX W479	6836	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	6868	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	6870	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.516
MX W479	6890	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	6912	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.576
MX W479	6913	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	6914	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	6915	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	6917	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	6918	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	7014	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7099	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.534
MX W479	7100	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.759
MX W479	7101	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7103	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	7111	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	7123	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	7126	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.603
MX W479	7127	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	7129	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	7130	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.683

MX W479 7131 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 7132 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 7195 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.554

MX W479 7196 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 7199 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.566

MX W479 7207 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 7220 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 7243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.628

MX W479 7244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 7246 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 7252 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.629

MX W479 7253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 7255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.681

MX W479 7316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.757

MX W479 7317 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 7318 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.570

MX W479 7319 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 7321 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 7323 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 7324 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 7326 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 7340 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.691

MX W479 7343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 7345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.627

MX W479 7346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 7351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 7363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 7364 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.215

MX W479 7366 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479	7367	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.612
MX W479	7368	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.799
MX W479	7369	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.518
MX W479	7388	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	7389	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	7390	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.725
MX W479	7391	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.797
MX W479	7393	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7395	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	7396	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	7397	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	7399	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.656
MX W479	7400	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.686
MX W479	7446	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.641
MX W479	7462	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.761
MX W479	7468	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	7469	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.811
MX W479	7470	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.856
MX W479	7471	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.803
MX W479	7484	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.540
MX W479	7513	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.558
MX W479	7514	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.585
MX W479	7531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.594
MX W479	7543	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	7585	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.532
MX W479	7586	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.831
MX W479	7587	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.573
MX W479	7602	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.586
MX W479	7603	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561

MX W479	7660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.708
MX W479	7661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7681	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	7682	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7683	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.707
MX W479	7684	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.628
MX W479	7753	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.641
MX W479	7755	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.502
MX W479	7794	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.607
MX W479	7796	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.032
MX W479	7797	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.212
MX W479	7798	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.800
MX W479	7801	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.637
MX W479	7802	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.906
MX W479	7803	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	7804	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	7805	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.048
MX W479	7806	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.021
MX W479	7807	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.755
MX W479	7819	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.902
MX W479	7867	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	7869	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	7873	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	7878	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	7879	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	7891	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	7892	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.532
MX W479	7894	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	7896	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556

MX W479	7897	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.506
MX W479	7898	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.761
MX W479	7899	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.773
MX W479	7900	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	7901	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.852
MX W479	7941	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	7948	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7989	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.671
MX W479	7990	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	7991	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	7992	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.622
MX W479	7993	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.288
MX W479	7994	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.608
MX W479	7996	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.606
MX W479	8011	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	8041	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.505
MX W479	8042	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	8062	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	8067	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	8086	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.668
MX W479	8087	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.504
MX W479	8088	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.618
MX W479	8089	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	8090	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.585
MX W479	8091	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	8107	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.613
MX W479	8108	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	8111	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.564
MX W479	8112	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.633

MX W479	8116	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	8117	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.838
MX W479	8118	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.725
MX W479	8119	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.001
MX W479	8120	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.649
MX W479	8190	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	8191	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	8192	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	8202	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.572
MX W479	8203	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.563
MX W479	8204	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.511
MX W479	8206	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	8208	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.642
MX W479	8209	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.717
MX W479	8210	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.670
MX W479	8211	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	8213	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.701
MX W479	8214	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.584
MX W479	8215	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.714
MX W479	8216	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.687
MX W479	8229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	8230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	8231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	8235	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	8238	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	8301	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.642
MX W479	8304	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	8306	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.685
MX W479	8307	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574

MX W479	8311	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.550
MX W479	8350	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.596
MX W479	8356	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.511
MX W479	8358	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	8360	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	8427	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.593
MX W479	8428	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.548
MX W479	8442	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	8445	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	8447	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	8448	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	8450	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	8451	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.695
MX W479	8452	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.533
MX W479	8514	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	8553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.944
MX W479	8567	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.619
MX W479	8570	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.535
MX W479	8571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	8595	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626
MX W479	8646	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	8660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.567
MX W479	8730	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	8734	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	8735	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.560
MX W479	8760	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** MODEL SETUP OPTIONS SUMMARY ***

** Model Options Selected:

* Model Uses Regulatory DEFAULT Options
* Model Is Setup For Calculation of Average CONCentration Values.
* NO GAS DEPOSITION Data Provided.
* NO PARTICLE DEPOSITION Data Provided.
* Model Uses NO DRY DEPLETION. DDPLETE = F
* Model Uses NO WET DEPLETION. WETDPLT = F
* Stack-tip Downwash.
* Model Accounts for ELEVated Terrain Effects.
* Use Calms Processing Routine.
* Use Missing Data Processing Routine.
* No Exponential Decay.
* Model Uses RURAL Dispersion Only.
* BULKRN - Use BULKRN Delta-T and SolarRad option for SBL in AERMET
* Model Assumes No FLAGPOLE Receptor Heights.
* The User Specified a Pollutant Type of: FORMALDE

**Model Calculates 1 Short Term Average(s) of: 1-HR
and Calculates ANNUAL Averages

**This Run Includes: 1 Source(s); 1 Source Group(s); and 3106 Receptor(s)

with: 1 POINT(s), including

0 POINTCAP(s) and 0 POINTHOR(s)

and: 0 VOLUME source(s)

and: 0 AREA type source(s)

and: 0 LINE source(s)

and: 0 RLINE/RLINEXT source(s)

and: 0 OPENPIT source(s)

and: 0 BUOYANT LINE source(s) with a total of 0 line(s)

and: 0 SWPOINT source(s)

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 22112

**Output Options Selected:

Model Outputs Tables of ANNUAL Averages by Receptor

Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours

m for Missing Hours

b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1730.68 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0

Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07

Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 3.9 MB of RAM.

**Input Runstream File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**Output Print File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**File for Summary of Results: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***

(1=YES; 0=NO)

1 1 1

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***

(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:19:40

PAGE 3

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling Met Version: 22112

Profile file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling

Surface format: FREE

Profile format: FREE

Surface station no.: 0 Upper air station no.: 23062

Name: UNKNOWN Name: DENVER WSFO, CO

Year: 2006 Year: 2006

First 24 hours of scalar data

YR MO DY JDY HR H0 U* W* DT/DZ ZICNV ZIMCH M-O LEN Z0 BOWEN ALBEDO REF WS WD HT REF TA HT

- -

06 01 01 1 01 -26.0 0.162 -9.000 -9.000 -999. 157. 11.8 0.01 1.89 1.00 4.43 326. 10.0 280.1 2.0

06 01 01 1 02 -58.1 0.325 -9.000 -9.000 -999. 445. 42.5 0.01 1.89 1.00 6.57 310. 10.0 281.4
2.0

06 01 01 1 03 -33.0 0.292 -9.000 -9.000 -999. 380. 54.5 0.01 1.89 1.00 5.72 272. 10.0 281.0
2.0

06 01 01 1 04 -14.9 0.128 -9.000 -9.000 -999. 134. 10.2 0.01 1.89 1.00 3.67 320. 10.0 279.8
2.0

06 01 01 1 05 -13.5 0.124 -9.000 -9.000 -999. 105. 10.1 0.01 1.89 1.00 3.71 337. 10.0 279.0
2.0

06 01 01 1 06 -18.3 0.176 -9.000 -9.000 -999. 177. 21.3 0.01 1.89 1.00 4.29 344. 10.0 278.3
2.0

06 01 01 1 07 -34.9 0.286 -9.000 -9.000 -999. 367. 48.1 0.01 1.89 1.00 5.68 327. 10.0 279.3
2.0

06 01 01 1 08 -39.7 0.440 -9.000 -9.000 -999. 701. 154.4 0.01 1.89 1.00 7.96 307. 10.0 279.8
2.0

06 01 01 1 09 -17.3 0.580 -9.000 -9.000 -999. 1058. 810.0 0.01 1.89 0.43 10.10 287. 10.0 279.4
2.0

06 01 01 1 10 38.3 0.682 0.602 0.005 164. 1349. -597.0 0.01 1.89 0.31 11.67 301. 10.0 280.9
2.0

06 01 01 1 11 83.4 0.893 1.120 0.005 486. 2020. -616.6 0.01 1.89 0.26 15.29 291. 10.0 281.4
2.0

06 01 01 1 12 97.2 0.889 1.326 0.005 693. 2013. -521.8 0.01 1.89 0.24 15.20 293. 10.0 281.3
2.0

06 01 01 1 13 137.5 0.968 1.629 0.005 909. 2279. -476.9 0.01 1.89 0.24 16.54 291. 10.0
281.3 2.0

06 01 01 1 14 122.9 0.912 1.653 0.005 1063. 2100. -445.7 0.01 1.89 0.25 15.56 290. 10.0
281.0 2.0

06 01 01 1 15 67.7 0.795 1.385 0.005 1138. 1727. -536.6 0.01 1.89 0.30 13.59 295. 10.0
280.1 2.0

06 01 01 1 16 0.0 0.715 -9.000 -9.000 -999. 1464. 8888.0 0.01 1.89 0.41 12.34 301. 10.0 279.0
2.0

06 01 01 1 17 0.0 0.673 -9.000 -9.000 -999. 1330. 8888.0 0.01 1.89 0.72 11.62 304. 10.0 277.1
2.0

06 01 01 1 18 0.0 0.546 -9.000 -9.000 -999. 987. 8888.0 0.01 1.89 1.00 9.43 293. 10.0 275.9
2.0

06 01 01 1 19 -46.9 0.630 -9.000 -9.000 -999. 1199. 388.5 0.01 1.89 1.00 11.09 294. 10.0 276.2
2.0

06 01 01 1 20 -49.7 0.337 -9.000 -9.000 -999. 566. 55.9 0.01 1.89 1.00 6.57 310. 10.0 275.6
2.0

06 01 01 1 21 -29.5 0.194 -9.000 -9.000 -999. 235. 17.9 0.01 1.89 1.00 4.69 313. 10.0 274.4
2.0

06 01 01 1 22 -29.9 0.238 -9.000 -9.000 -999. 279. 32.8 0.01 1.89 1.00 5.32 338. 10.0 275.8
2.0

06 01 01 1 23 -15.8 0.134 -9.000 -9.000 -999. 123. 11.1 0.01 1.89 1.00 3.67 241. 10.0 274.5
2.0

06 01 01 1 24 -19.1 0.117 -9.000 -9.000 -999. 96. 6.1 0.01 1.89 1.00 3.98 279. 10.0 273.6
2.0

First hour of profile data

YR MO DY HR HEIGHT F WDIR WSPD AMB_TMP sigmaA sigmaW sigmaV

06 01 01 01 2.0 0 -999. -99.00 280.1 99.0 -99.00 -99.00

06 01 01 01 10.0 0 326. 4.43 282.0 5.4 -99.00 0.42

06 01 01 01 60.0 1 316. 5.10 283.1 6.1 -99.00 0.54

F indicates top of profile (=1) or below (=0)

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:19:40

PAGE 4

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF FORMALDE IN MICROGRAMS/M**3 **

NETWORK

GROUP ID AVERAGE CONC RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

- -

ALL 1ST HIGHEST VALUE IS 0.00128 AT (499450.00, 4508500.00, 1603.57, 1603.57, 0.00) DC

2ND HIGHEST VALUE IS 0.00126 AT (499450.00, 4508450.00, 1603.33, 1603.33, 0.00) DC

3RD HIGHEST VALUE IS 0.00125 AT (499700.00, 4508150.00, 1610.72, 1610.72, 0.00) DC

4TH HIGHEST VALUE IS 0.00122 AT (499450.00, 4508550.00, 1603.86, 1603.86, 0.00) DC

5TH HIGHEST VALUE IS 0.00121 AT (499750.00, 4508100.00, 1608.86, 1608.86, 0.00) DC

6TH HIGHEST VALUE IS 0.00120 AT (499750.00, 4508150.00, 1610.15, 1610.15, 0.00) DC

7TH HIGHEST VALUE IS 0.00119 AT (499700.00, 4508100.00, 1609.85, 1609.85, 0.00) DC

8TH HIGHEST VALUE IS 0.00118 AT (499400.00, 4508500.00, 1603.34, 1603.34, 0.00) DC

9TH HIGHEST VALUE IS 0.00118 AT (499800.00, 4508100.00, 1606.47, 1606.47, 0.00) DC

10TH HIGHEST VALUE IS 0.00116 AT (499400.00, 4508550.00, 1603.60, 1603.60, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF FORMALDE IN MICROGRAMS/M**3 **

DATE NETWORK

GROUP ID AVERAGE CONC (YYMMDDHH) RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

- -

ALL HIGH 1ST HIGH VALUE IS 0.08848 ON 06102824: AT (499600.00, 4508200.00, 1608.71, 1608.71, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:19:40

PAGE 6

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)

A Total of 624 Warning Message(s)

A Total of 142 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 1 Calm Hours Identified

A Total of 141 Missing Hours Identified (1.61 Percent)

******** FATAL ERROR MESSAGES ********

*** NONE ***

******** WARNING MESSAGES ********

ME W181 3169 MEOPEN: BULKRN Delta-T & SolarRad option for SBL was used in AERMET

MX W403 3169 PFLCNV: Turbulence data is being used w/o ADJ_U* option SigA Data

MX W479 24 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 29 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 30 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 31 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 48 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 51 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 52 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 53 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 141 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 143 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.877

MX W479 147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 151 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 215 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 216 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 221 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 222 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.588

MX W479 244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 291 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.544

MX W479 296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 308 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.572

MX W479 312 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 313 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.700

MX W479 314 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 317 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.795

MX W479 318 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 320 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 321 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 340 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 342 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 475 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.580

MX W479 479 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 482 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.746

MX W479 483 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 484 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 486 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 487 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.681

MX W479 488 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.697

MX W479 489 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.921

MX W479 509 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 524 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 526 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 527 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 528 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.926

MX W479 529 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.676

MX W479 530 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.808

MX W479 531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.740

MX W479 532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.537

MX W479 533 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.621

MX W479 534 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.830

MX W479 535 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 554 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 555 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 556 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 573 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.536

MX W479 574 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.241

MX W479 575 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 576 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.562

MX W479 577 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 578 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.213

MX W479 579 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 580 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 581 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.713

MX W479 582 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.678

MX W479 583 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.869

MX W479 584 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 595 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 597 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.667

MX W479 599 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.596

MX W479 600 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 601 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.705

MX W479 605 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.665

MX W479 632 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 725 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 727 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 775 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 822 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 837 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 838 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 839 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 932 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 1029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 1031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479 1034 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 1035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 1051 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 1052 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 1053 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.884

MX W479 1054 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.859

MX W479	1055	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.766
MX W479	1056	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.677
MX W479	1060	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	1061	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.639
MX W479	1197	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	1198	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.709
MX W479	1199	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	1200	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.530
MX W479	1201	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.663
MX W479	1202	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.650
MX W479	1203	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.590
MX W479	1204	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.726
MX W479	1205	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.750
MX W479	1206	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.700
MX W479	1208	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	1218	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	1219	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.824
MX W479	1220	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	1221	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.731
MX W479	1222	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	1223	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	1224	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	1225	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	1226	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753
MX W479	1227	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	1228	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	1229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602
MX W479	1230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	1231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753

MX W479 1243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 1244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 1245 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 1276 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 1277 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 1278 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.729

MX W479 1293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 1294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.851

MX W479 1295 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 1296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 1297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 1300 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 1301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.723

MX W479 1302 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 1303 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 1316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.692

MX W479 1343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 1344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.720

MX W479 1345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 1346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 1347 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.663

MX W479 1348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 1363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 1365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.696

MX W479 1373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 1374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1375 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.622

MX W479 1392 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 1394 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.577

MX W479 1395 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 1396 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 1397 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 1441 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 1442 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1483 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 1532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 1537 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1539 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 1540 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 1541 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 1543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 1566 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 1661 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 1989 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 1990 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 1991 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.509

MX W479 1993 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.563

MX W479 1994 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.534

MX W479 2086 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 2088 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 2089 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 2093 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 2228 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.579

MX W479 2229 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 2230 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.693

MX W479 2231 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 2232 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.632

MX W479 2234 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 2235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 2253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 2254 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 2255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.755

MX W479 2262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 2348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 2349 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2350 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 2351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2352 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.834

MX W479 2353 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 2354 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2355 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.560

MX W479 2356 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 2373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.752

MX W479 2374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 2378 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 2379 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 2380 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 2382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 2399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.920

MX W479 2421 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2422 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 2424 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 2425 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 2428 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 2429 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479	2430	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	2445	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.748
MX W479	2446	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614
MX W479	2447	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.779
MX W479	2448	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.743
MX W479	2449	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.733
MX W479	2450	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	2468	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.568
MX W479	2469	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.019
MX W479	2470	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.976
MX W479	2471	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.882
MX W479	2472	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.650
MX W479	2542	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.620
MX W479	2543	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.826
MX W479	2544	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.734
MX W479	2545	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.629
MX W479	2546	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.769
MX W479	2547	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.656
MX W479	2548	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.679
MX W479	2549	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.853
MX W479	2550	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	2615	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	2616	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	2617	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614
MX W479	2639	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	2640	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	2641	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.777
MX W479	2643	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.648
MX W479	2645	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602

MX W479 2646 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 2663 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.896

MX W479 2664 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 2666 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 2669 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 2670 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 2763 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.504

MX W479 2783 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.567

MX W479 2786 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.588

MX W479 2788 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2789 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2832 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 2833 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.506

MX W479 2900 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 2901 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.673

MX W479 2902 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.730

MX W479 2903 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 2905 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.672

MX W479 2906 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.753

MX W479 2907 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 3045 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 3047 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.554

MX W479 3048 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 3148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 3149 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 3168 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 3169 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 3170 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.601

MX W479	3171	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.796
MX W479	3172	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	3173	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.889
MX W479	3174	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	3239	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	3262	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.633
MX W479	3263	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	3289	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.546
MX W479	3290	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.586
MX W479	3291	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.607
MX W479	3293	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	3294	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	3313	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	3316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.595
MX W479	3337	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	3338	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.521
MX W479	3339	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	3363	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.584
MX W479	3364	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	3365	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	3366	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.576
MX W479	3382	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.620
MX W479	3383	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.727
MX W479	3384	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.606
MX W479	3453	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.648
MX W479	3454	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.711
MX W479	3457	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	3509	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.654
MX W479	3525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614

MX W479	3671	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.541
MX W479	3674	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	3693	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	3748	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.562
MX W479	3792	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.536
MX W479	3796	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.568
MX W479	4029	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.848
MX W479	4030	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.707
MX W479	4031	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	4035	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	4036	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	4037	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	4057	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.502
MX W479	4080	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	4101	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.545
MX W479	4102	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	4103	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.847
MX W479	4104	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.608
MX W479	4105	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	4172	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.682
MX W479	4173	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.824
MX W479	4227	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	4297	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	4298	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.590
MX W479	4301	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.582
MX W479	4493	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.603
MX W479	4586	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	4629	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.548
MX W479	4630	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.517

MX W479	4652	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.510
MX W479	4653	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.685
MX W479	4654	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	4656	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	4657	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.903
MX W479	4658	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.975
MX W479	4659	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.826
MX W479	4660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.741
MX W479	4661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.888
MX W479	4677	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.524
MX W479	4679	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	4680	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	4685	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.731
MX W479	4724	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	4996	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	5331	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.662
MX W479	5332	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561
MX W479	5471	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	5472	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	5475	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	5614	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.669
MX W479	5615	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.549
MX W479	5621	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.557
MX W479	5622	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.623
MX W479	5790	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.581
MX W479	5804	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	5805	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	5809	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	5812	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.675

MX W479	5813	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	5814	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	5979	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	5980	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.546
MX W479	6120	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	6121	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.501
MX W479	6125	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	6126	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	6142	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	6146	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.582
MX W479	6147	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.573
MX W479	6148	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.779
MX W479	6149	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.883
MX W479	6150	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.860
MX W479	6267	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.540
MX W479	6268	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	6271	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.529
MX W479	6286	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.595
MX W479	6292	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.577
MX W479	6294	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.615
MX W479	6405	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.611
MX W479	6406	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.887
MX W479	6407	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	6408	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.541
MX W479	6409	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	6410	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.740
MX W479	6411	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	6413	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	6430	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.587

MX W479	6431	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	6435	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.023
MX W479	6436	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	6486	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	6501	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.822
MX W479	6524	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.557
MX W479	6525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.600
MX W479	6526	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	6528	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.612
MX W479	6529	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	6530	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	6531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.662
MX W479	6532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.680
MX W479	6548	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.718
MX W479	6549	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.739
MX W479	6550	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.767
MX W479	6553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.592
MX W479	6554	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.776
MX W479	6555	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.581
MX W479	6556	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	6558	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.988
MX W479	6559	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.766
MX W479	6571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	6572	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.870
MX W479	6573	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.668
MX W479	6574	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.705
MX W479	6577	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.791
MX W479	6578	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	6579	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.622

MX W479 6580 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 6581 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.872

MX W479 6582 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.704

MX W479 6583 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 6596 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 6602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 6791 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.545

MX W479 6835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.564

MX W479 6836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 6868 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 6870 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 6890 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 6912 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 6913 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 6914 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.591

MX W479 6915 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 6917 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 6918 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 7014 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 7099 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.534

MX W479 7100 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.759

MX W479 7101 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7103 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 7111 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 7123 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 7126 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 7127 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 7129 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.509

MX W479 7130 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 7131 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 7132 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 7195 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.554

MX W479 7196 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 7199 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.566

MX W479 7207 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 7220 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 7243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.628

MX W479 7244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 7246 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 7252 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.629

MX W479 7253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 7255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.681

MX W479 7316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.757

MX W479 7317 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 7318 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.570

MX W479 7319 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 7321 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 7323 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 7324 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 7326 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 7340 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.691

MX W479 7343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 7345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.627

MX W479 7346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 7351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 7363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 7364 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.215

MX W479 7366 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 7367 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.612

MX W479 7368 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.799

MX W479 7369 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.518

MX W479 7388 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 7389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 7390 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 7391 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.797

MX W479 7393 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7395 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 7396 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 7397 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 7399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.656

MX W479 7400 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.686

MX W479 7446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.641

MX W479 7462 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.761

MX W479 7468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 7469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.811

MX W479 7470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.856

MX W479 7471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.803

MX W479 7484 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 7513 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 7514 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 7531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.594

MX W479 7543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 7585 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.532

MX W479 7586 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.831

MX W479 7587 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.573

MX W479 7602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 7603 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479	7660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.708
MX W479	7661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7681	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	7682	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7683	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.707
MX W479	7684	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.628
MX W479	7753	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.641
MX W479	7755	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.502
MX W479	7794	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.607
MX W479	7796	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.032
MX W479	7797	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.212
MX W479	7798	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.800
MX W479	7801	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.637
MX W479	7802	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.906
MX W479	7803	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	7804	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	7805	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.048
MX W479	7806	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.021
MX W479	7807	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.755
MX W479	7819	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.902
MX W479	7867	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	7869	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	7873	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	7878	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	7879	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	7891	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	7892	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.532
MX W479	7894	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	7896	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556

MX W479 7897 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.506

MX W479 7898 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.761

MX W479 7899 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.773

MX W479 7900 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 7901 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.852

MX W479 7941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 7948 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 7989 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 7990 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 7991 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.627

MX W479 7992 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.622

MX W479 7993 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.288

MX W479 7994 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 7996 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.606

MX W479 8011 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 8041 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 8042 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 8062 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 8067 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 8086 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 8087 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.504

MX W479 8088 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.618

MX W479 8089 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 8090 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 8091 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.523

MX W479 8107 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 8108 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 8111 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.564

MX W479 8112 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479	8116	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	8117	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.838
MX W479	8118	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.725
MX W479	8119	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.001
MX W479	8120	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.649
MX W479	8190	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	8191	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	8192	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	8202	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.572
MX W479	8203	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.563
MX W479	8204	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.511
MX W479	8206	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	8208	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.642
MX W479	8209	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.717
MX W479	8210	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.670
MX W479	8211	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	8213	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.701
MX W479	8214	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.584
MX W479	8215	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.714
MX W479	8216	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.687
MX W479	8229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	8230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	8231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	8235	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	8238	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	8301	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.642
MX W479	8304	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	8306	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.685
MX W479	8307	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574

MX W479	8311	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.550
MX W479	8350	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.596
MX W479	8356	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.511
MX W479	8358	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	8360	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	8427	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.593
MX W479	8428	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.548
MX W479	8442	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	8445	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	8447	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	8448	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	8450	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	8451	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.695
MX W479	8452	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.533
MX W479	8514	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	8553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.944
MX W479	8567	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.619
MX W479	8570	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.535
MX W479	8571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	8595	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626
MX W479	8646	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	8660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.567
MX W479	8730	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	8734	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	8735	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.560
MX W479	8760	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** MODEL SETUP OPTIONS SUMMARY ***

** Model Options Selected:

* Model Uses Regulatory DEFAULT Options
* Model Is Setup For Calculation of Average CONCentration Values.
* NO GAS DEPOSITION Data Provided.
* NO PARTICLE DEPOSITION Data Provided.
* Model Uses NO DRY DEPLETION. DDPLETE = F
* Model Uses NO WET DEPLETION. WETDPLT = F
* Stack-tip Downwash.
* Model Accounts for ELEVated Terrain Effects.
* Use Calms Processing Routine.
* Use Missing Data Processing Routine.
* No Exponential Decay.
* Model Uses RURAL Dispersion Only.
* BULKRN - Use BULKRN Delta-T and SolarRad option for SBL in AERMET
* Model Assumes No FLAGPOLE Receptor Heights.
* The User Specified a Pollutant Type of: TOLUENE

**Model Calculates 1 Short Term Average(s) of: 1-HR
and Calculates ANNUAL Averages

**This Run Includes: 1 Source(s); 1 Source Group(s); and 3106 Receptor(s)

with: 1 POINT(s), including

0 POINTCAP(s) and 0 POINTHOR(s)

and: 0 VOLUME source(s)

and: 0 AREA type source(s)

and: 0 LINE source(s)

and: 0 RLINE/RLINEXT source(s)

and: 0 OPENPIT source(s)

and: 0 BUOYANT LINE source(s) with a total of 0 line(s)

and: 0 SWPOINT source(s)

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 22112

**Output Options Selected:

Model Outputs Tables of ANNUAL Averages by Receptor

Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours

m for Missing Hours

b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1730.68 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0

Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07

Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 3.9 MB of RAM.

**Input Runstream File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**Output Print File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**File for Summary of Results: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***

(1=YES; 0=NO)

1 1 1

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***

(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:20:21

PAGE 3

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling
Met Version: 22112

Profile file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling

Surface format: FREE

Profile format: FREE

Surface station no.: 0 Upper air station no.: 23062

Name: UNKNOWN Name: DENVER WSFO, CO

Year: 2006 Year: 2006

First 24 hours of scalar data

YR MO DY JDY HR H0 U* W* DT/DZ ZICNV ZIMCH M-O LEN Z0 BOWEN ALBEDO REF WS WD HT REF TA HT

- -

06 01 01 1 01 -26.0 0.162 -9.000 -9.000 -999. 157. 11.8 0.01 1.89 1.00 4.43 326. 10.0 280.1 2.0

06 01 01 1 02 -58.1 0.325 -9.000 -9.000 -999. 445. 42.5 0.01 1.89 1.00 6.57 310. 10.0 281.4
2.0

06 01 01 1 03 -33.0 0.292 -9.000 -9.000 -999. 380. 54.5 0.01 1.89 1.00 5.72 272. 10.0 281.0
2.0

06 01 01 1 04 -14.9 0.128 -9.000 -9.000 -999. 134. 10.2 0.01 1.89 1.00 3.67 320. 10.0 279.8
2.0

06 01 01 1 05 -13.5 0.124 -9.000 -9.000 -999. 105. 10.1 0.01 1.89 1.00 3.71 337. 10.0 279.0
2.0

06 01 01 1 06 -18.3 0.176 -9.000 -9.000 -999. 177. 21.3 0.01 1.89 1.00 4.29 344. 10.0 278.3
2.0

06 01 01 1 07 -34.9 0.286 -9.000 -9.000 -999. 367. 48.1 0.01 1.89 1.00 5.68 327. 10.0 279.3
2.0

06 01 01 1 08 -39.7 0.440 -9.000 -9.000 -999. 701. 154.4 0.01 1.89 1.00 7.96 307. 10.0 279.8
2.0

06 01 01 1 09 -17.3 0.580 -9.000 -9.000 -999. 1058. 810.0 0.01 1.89 0.43 10.10 287. 10.0 279.4
2.0

06 01 01 1 10 38.3 0.682 0.602 0.005 164. 1349. -597.0 0.01 1.89 0.31 11.67 301. 10.0 280.9
2.0

06 01 01 1 11 83.4 0.893 1.120 0.005 486. 2020. -616.6 0.01 1.89 0.26 15.29 291. 10.0 281.4
2.0

06 01 01 1 12 97.2 0.889 1.326 0.005 693. 2013. -521.8 0.01 1.89 0.24 15.20 293. 10.0 281.3
2.0

06 01 01 1 13 137.5 0.968 1.629 0.005 909. 2279. -476.9 0.01 1.89 0.24 16.54 291. 10.0
281.3 2.0

06 01 01 1 14 122.9 0.912 1.653 0.005 1063. 2100. -445.7 0.01 1.89 0.25 15.56 290. 10.0
281.0 2.0

06 01 01 1 15 67.7 0.795 1.385 0.005 1138. 1727. -536.6 0.01 1.89 0.30 13.59 295. 10.0
280.1 2.0

06 01 01 1 16 0.0 0.715 -9.000 -9.000 -999. 1464. 8888.0 0.01 1.89 0.41 12.34 301. 10.0 279.0
2.0

06 01 01 1 17 0.0 0.673 -9.000 -9.000 -999. 1330. 8888.0 0.01 1.89 0.72 11.62 304. 10.0 277.1
2.0

06 01 01 1 18 0.0 0.546 -9.000 -9.000 -999. 987. 8888.0 0.01 1.89 1.00 9.43 293. 10.0 275.9
2.0

06 01 01 1 19 -46.9 0.630 -9.000 -9.000 -999. 1199. 388.5 0.01 1.89 1.00 11.09 294. 10.0 276.2
2.0

06 01 01 1 20 -49.7 0.337 -9.000 -9.000 -999. 566. 55.9 0.01 1.89 1.00 6.57 310. 10.0 275.6
2.0

06 01 01 1 21 -29.5 0.194 -9.000 -9.000 -999. 235. 17.9 0.01 1.89 1.00 4.69 313. 10.0 274.4
2.0

06 01 01 1 22 -29.9 0.238 -9.000 -9.000 -999. 279. 32.8 0.01 1.89 1.00 5.32 338. 10.0 275.8
2.0

06 01 01 1 23 -15.8 0.134 -9.000 -9.000 -999. 123. 11.1 0.01 1.89 1.00 3.67 241. 10.0 274.5
2.0

06 01 01 1 24 -19.1 0.117 -9.000 -9.000 -999. 96. 6.1 0.01 1.89 1.00 3.98 279. 10.0 273.6
2.0

First hour of profile data

YR MO DY HR HEIGHT F WDIR WSPD AMB_TMP sigmaA sigmaW sigmaV

06 01 01 01 2.0 0 -999. -99.00 280.1 99.0 -99.00 -99.00

06 01 01 01 10.0 0 326. 4.43 282.0 5.4 -99.00 0.42

06 01 01 01 60.0 1 316. 5.10 283.1 6.1 -99.00 0.54

F indicates top of profile (=1) or below (=0)

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF TOLUENE IN MICROGRAMS/M**3 **

NETWORK

GROUP ID AVERAGE CONC RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

- -

ALL 1ST HIGHEST VALUE IS 0.00580 AT (499450.00, 4508500.00, 1603.57, 1603.57, 0.00) DC

2ND HIGHEST VALUE IS 0.00567 AT (499450.00, 4508450.00, 1603.33, 1603.33, 0.00) DC

3RD HIGHEST VALUE IS 0.00563 AT (499700.00, 4508150.00, 1610.72, 1610.72, 0.00) DC

4TH HIGHEST VALUE IS 0.00553 AT (499450.00, 4508550.00, 1603.86, 1603.86, 0.00) DC

5TH HIGHEST VALUE IS 0.00547 AT (499750.00, 4508100.00, 1608.86, 1608.86, 0.00) DC

6TH HIGHEST VALUE IS 0.00540 AT (499750.00, 4508150.00, 1610.15, 1610.15, 0.00) DC

7TH HIGHEST VALUE IS 0.00537 AT (499700.00, 4508100.00, 1609.85, 1609.85, 0.00) DC

8TH HIGHEST VALUE IS 0.00534 AT (499400.00, 4508500.00, 1603.34, 1603.34, 0.00) DC

9TH HIGHEST VALUE IS 0.00532 AT (499800.00, 4508100.00, 1606.47, 1606.47, 0.00) DC

10TH HIGHEST VALUE IS 0.00523 AT (499400.00, 4508550.00, 1603.60, 1603.60, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF TOLUENE IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	NETWORK RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

ALL HIGH 1ST HIGH VALUE IS 0.39946 ON 06102824: AT (499600.00, 4508200.00, 1608.71, 1608.71, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)

A Total of 624 Warning Message(s)

A Total of 142 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 1 Calm Hours Identified

A Total of 141 Missing Hours Identified (1.61 Percent)

******** FATAL ERROR MESSAGES ********

*** NONE ***

******** WARNING MESSAGES ********

ME W181 3169 MEOPEN: BULKRN Delta-T & SolarRad option for SBL was used in AERMET

MX W403 3169 PFLCNV: Turbulence data is being used w/o ADJ_U* option SigA Data

MX W479 24 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 29 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 30 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 31 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 48 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 51 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 52 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 53 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 141 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 143 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.877

MX W479 147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 151 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 215 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 216 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 221 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 222 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.588

MX W479 244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 291 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.544

MX W479 296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 308 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.572

MX W479 312 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 313 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.700

MX W479 314 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 317 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.795

MX W479 318 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 320 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 321 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 340 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 342 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 475 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.580

MX W479 479 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 482 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.746

MX W479 483 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 484 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 486 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 487 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.681

MX W479 488 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.697

MX W479 489 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.921

MX W479 509 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 524 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 526 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 527 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 528 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.926

MX W479 529 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.676

MX W479 530 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.808

MX W479 531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.740

MX W479 532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.537

MX W479 533 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.621

MX W479 534 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.830

MX W479 535 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 554 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 555 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 556 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 573 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.536

MX W479 574 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.241

MX W479 575 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 576 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.562

MX W479 577 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 578 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.213

MX W479 579 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 580 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 581 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.713

MX W479 582 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.678

MX W479 583 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.869

MX W479 584 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 595 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 597 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.667

MX W479 599 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.596

MX W479 600 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 601 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.705

MX W479 605 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.665

MX W479 632 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 725 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 727 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 775 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 822 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 837 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 838 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 839 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 932 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 1029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 1031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479 1034 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 1035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 1051 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 1052 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 1053 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.884

MX W479 1054 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.859

MX W479	1055	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.766
MX W479	1056	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.677
MX W479	1060	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	1061	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.639
MX W479	1197	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	1198	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.709
MX W479	1199	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	1200	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.530
MX W479	1201	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.663
MX W479	1202	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.650
MX W479	1203	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.590
MX W479	1204	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.726
MX W479	1205	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.750
MX W479	1206	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.700
MX W479	1208	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	1218	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	1219	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.824
MX W479	1220	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	1221	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.731
MX W479	1222	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	1223	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	1224	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	1225	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	1226	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753
MX W479	1227	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	1228	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	1229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602
MX W479	1230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	1231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753

MX W479 1243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 1244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 1245 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 1276 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 1277 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 1278 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.729

MX W479 1293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 1294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.851

MX W479 1295 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 1296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 1297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 1300 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 1301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.723

MX W479 1302 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 1303 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 1316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.692

MX W479 1343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 1344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.720

MX W479 1345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 1346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 1347 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.663

MX W479 1348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 1363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 1365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.696

MX W479 1373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 1374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1375 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.622

MX W479	1392	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	1394	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.577
MX W479	1395	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	1396	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.671
MX W479	1397	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	1441	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	1442	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	1483	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.647
MX W479	1532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	1537	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	1539	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.613
MX W479	1540	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	1541	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.648
MX W479	1543	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614
MX W479	1566	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.569
MX W479	1661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.575
MX W479	1989	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	1990	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	1991	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	1993	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.563
MX W479	1994	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.534
MX W479	2086	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	2088	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	2089	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	2093	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	2228	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.579
MX W479	2229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	2230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.693
MX W479	2231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.634

MX W479 2232 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.632

MX W479 2234 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 2235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 2253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 2254 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 2255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.755

MX W479 2262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 2348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 2349 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2350 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 2351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2352 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.834

MX W479 2353 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 2354 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2355 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.560

MX W479 2356 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 2373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.752

MX W479 2374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 2378 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 2379 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 2380 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 2382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 2399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.920

MX W479 2421 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2422 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 2424 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 2425 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 2428 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 2429 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 2430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 2445 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2447 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.779

MX W479 2448 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 2449 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.733

MX W479 2450 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 2468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.019

MX W479 2470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.976

MX W479 2471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.882

MX W479 2472 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.650

MX W479 2542 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.826

MX W479 2544 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 2545 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.629

MX W479 2546 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.769

MX W479 2547 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.656

MX W479 2548 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.679

MX W479 2549 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.853

MX W479 2550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2615 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 2616 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 2617 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2639 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 2640 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2641 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.777

MX W479 2643 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 2645 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 2646 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 2663 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.896

MX W479 2664 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 2666 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 2669 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 2670 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 2763 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.504

MX W479 2783 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.567

MX W479 2786 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.588

MX W479 2788 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2789 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2832 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 2833 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.506

MX W479 2900 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 2901 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.673

MX W479 2902 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.730

MX W479 2903 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 2905 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.672

MX W479 2906 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.753

MX W479 2907 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 3045 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 3047 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.554

MX W479 3048 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 3148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 3149 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 3168 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 3169 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 3170 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.601

MX W479	3171	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.796
MX W479	3172	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	3173	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.889
MX W479	3174	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	3239	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	3262	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.633
MX W479	3263	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	3289	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.546
MX W479	3290	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.586
MX W479	3291	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.607
MX W479	3293	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	3294	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	3313	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	3316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.595
MX W479	3337	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	3338	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.521
MX W479	3339	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	3363	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.584
MX W479	3364	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	3365	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	3366	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.576
MX W479	3382	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.620
MX W479	3383	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.727
MX W479	3384	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.606
MX W479	3453	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.648
MX W479	3454	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.711
MX W479	3457	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	3509	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.654
MX W479	3525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614

MX W479	3671	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.541
MX W479	3674	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	3693	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	3748	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.562
MX W479	3792	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.536
MX W479	3796	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.568
MX W479	4029	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.848
MX W479	4030	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.707
MX W479	4031	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	4035	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	4036	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	4037	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	4057	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.502
MX W479	4080	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	4101	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.545
MX W479	4102	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	4103	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.847
MX W479	4104	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.608
MX W479	4105	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	4172	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.682
MX W479	4173	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.824
MX W479	4227	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	4297	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	4298	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.590
MX W479	4301	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.582
MX W479	4493	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.603
MX W479	4586	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	4629	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.548
MX W479	4630	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.517

MX W479	4652	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.510
MX W479	4653	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.685
MX W479	4654	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	4656	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	4657	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.903
MX W479	4658	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.975
MX W479	4659	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.826
MX W479	4660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.741
MX W479	4661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.888
MX W479	4677	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.524
MX W479	4679	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	4680	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	4685	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.731
MX W479	4724	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	4996	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	5331	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.662
MX W479	5332	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561
MX W479	5471	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	5472	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	5475	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	5614	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.669
MX W479	5615	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.549
MX W479	5621	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.557
MX W479	5622	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.623
MX W479	5790	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.581
MX W479	5804	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	5805	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	5809	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	5812	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.675

MX W479 5813 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.645

MX W479 5814 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.523

MX W479 5979 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 5980 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 6120 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 6121 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 6125 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 6126 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 6142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 6146 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 6147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.573

MX W479 6148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.779

MX W479 6149 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.883

MX W479 6150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.860

MX W479 6267 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 6268 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 6271 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 6286 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 6292 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.577

MX W479 6294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.615

MX W479 6405 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 6406 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.887

MX W479 6407 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 6408 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.541

MX W479 6409 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 6410 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.740

MX W479 6411 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 6413 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 6430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479	6431	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	6435	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.023
MX W479	6436	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	6486	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	6501	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.822
MX W479	6524	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.557
MX W479	6525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.600
MX W479	6526	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	6528	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.612
MX W479	6529	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	6530	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	6531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.662
MX W479	6532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.680
MX W479	6548	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.718
MX W479	6549	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.739
MX W479	6550	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.767
MX W479	6553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.592
MX W479	6554	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.776
MX W479	6555	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.581
MX W479	6556	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	6558	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.988
MX W479	6559	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.766
MX W479	6571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	6572	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.870
MX W479	6573	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.668
MX W479	6574	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.705
MX W479	6577	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.791
MX W479	6578	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	6579	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.622

MX W479	6580	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	6581	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.872
MX W479	6582	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.704
MX W479	6583	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	6596	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	6602	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	6791	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.545
MX W479	6835	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.564
MX W479	6836	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	6868	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	6870	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.516
MX W479	6890	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	6912	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.576
MX W479	6913	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	6914	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	6915	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	6917	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	6918	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	7014	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7099	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.534
MX W479	7100	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.759
MX W479	7101	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7103	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	7111	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	7123	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	7126	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.603
MX W479	7127	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	7129	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	7130	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.683

MX W479	7131	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	7132	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.525
MX W479	7195	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.554
MX W479	7196	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	7199	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	7207	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	7220	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.644
MX W479	7243	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.628
MX W479	7244	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.575
MX W479	7246	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.712
MX W479	7252	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.629
MX W479	7253	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	7255	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.681
MX W479	7316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.757
MX W479	7317	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.558
MX W479	7318	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.570
MX W479	7319	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	7321	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602
MX W479	7323	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	7324	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.578
MX W479	7326	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	7340	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.691
MX W479	7343	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.510
MX W479	7345	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	7346	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	7351	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	7363	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	7364	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.215
MX W479	7366	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.516

MX W479 7367 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.612

MX W479 7368 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.799

MX W479 7369 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.518

MX W479 7388 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 7389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 7390 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 7391 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.797

MX W479 7393 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7395 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 7396 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 7397 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 7399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.656

MX W479 7400 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.686

MX W479 7446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.641

MX W479 7462 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.761

MX W479 7468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 7469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.811

MX W479 7470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.856

MX W479 7471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.803

MX W479 7484 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 7513 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 7514 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 7531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.594

MX W479 7543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 7585 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.532

MX W479 7586 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.831

MX W479 7587 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.573

MX W479 7602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 7603 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479	7660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.708
MX W479	7661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7681	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	7682	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7683	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.707
MX W479	7684	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.628
MX W479	7753	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.641
MX W479	7755	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.502
MX W479	7794	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.607
MX W479	7796	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.032
MX W479	7797	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.212
MX W479	7798	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.800
MX W479	7801	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.637
MX W479	7802	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.906
MX W479	7803	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	7804	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	7805	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.048
MX W479	7806	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.021
MX W479	7807	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.755
MX W479	7819	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.902
MX W479	7867	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	7869	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	7873	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	7878	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	7879	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	7891	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	7892	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.532
MX W479	7894	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	7896	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556

MX W479 7897 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.506

MX W479 7898 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.761

MX W479 7899 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.773

MX W479 7900 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 7901 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.852

MX W479 7941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 7948 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 7989 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 7990 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 7991 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.627

MX W479 7992 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.622

MX W479 7993 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.288

MX W479 7994 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 7996 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.606

MX W479 8011 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 8041 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 8042 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 8062 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 8067 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 8086 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 8087 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.504

MX W479 8088 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.618

MX W479 8089 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 8090 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 8091 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.523

MX W479 8107 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 8108 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 8111 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.564

MX W479 8112 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479	8116	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	8117	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.838
MX W479	8118	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.725
MX W479	8119	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.001
MX W479	8120	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.649
MX W479	8190	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	8191	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	8192	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	8202	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.572
MX W479	8203	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.563
MX W479	8204	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.511
MX W479	8206	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	8208	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.642
MX W479	8209	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.717
MX W479	8210	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.670
MX W479	8211	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	8213	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.701
MX W479	8214	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.584
MX W479	8215	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.714
MX W479	8216	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.687
MX W479	8229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	8230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	8231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	8235	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	8238	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	8301	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.642
MX W479	8304	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	8306	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.685
MX W479	8307	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574

MX W479	8311	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.550
MX W479	8350	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.596
MX W479	8356	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.511
MX W479	8358	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	8360	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	8427	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.593
MX W479	8428	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.548
MX W479	8442	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	8445	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	8447	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	8448	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	8450	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	8451	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.695
MX W479	8452	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.533
MX W479	8514	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	8553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.944
MX W479	8567	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.619
MX W479	8570	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.535
MX W479	8571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	8595	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626
MX W479	8646	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	8660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.567
MX W479	8730	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	8734	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	8735	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.560
MX W479	8760	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** MODEL SETUP OPTIONS SUMMARY ***

** Model Options Selected:

* Model Uses Regulatory DEFAULT Options
* Model Is Setup For Calculation of Average CONCentration Values.
* NO GAS DEPOSITION Data Provided.
* NO PARTICLE DEPOSITION Data Provided.
* Model Uses NO DRY DEPLETION. DDPLETE = F
* Model Uses NO WET DEPLETION. WETDPLT = F
* Stack-tip Downwash.
* Model Accounts for ELEVated Terrain Effects.
* Use Calms Processing Routine.
* Use Missing Data Processing Routine.
* No Exponential Decay.
* Model Uses RURAL Dispersion Only.
* BULKRN - Use BULKRN Delta-T and SolarRad option for SBL in AERMET
* Model Assumes No FLAGPOLE Receptor Heights.
* The User Specified a Pollutant Type of: QUINONE

**Model Calculates 1 Short Term Average(s) of: 1-HR
and Calculates ANNUAL Averages

**This Run Includes: 1 Source(s); 1 Source Group(s); and 3106 Receptor(s)

with: 1 POINT(s), including

0 POINTCAP(s) and 0 POINTHOR(s)

and: 0 VOLUME source(s)

and: 0 AREA type source(s)

and: 0 LINE source(s)

and: 0 RLINE/RLINEXT source(s)

and: 0 OPENPIT source(s)

and: 0 BUOYANT LINE source(s) with a total of 0 line(s)

and: 0 SWPOINT source(s)

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 22112

**Output Options Selected:

Model Outputs Tables of ANNUAL Averages by Receptor

Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours

m for Missing Hours

b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1730.68 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0

Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07

Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 3.9 MB of RAM.

**Input Runstream File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**Output Print File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**File for Summary of Results: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***

(1=YES; 0=NO)

1 1 1

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***

(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:21:01

PAGE 3

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling Met Version: 22112

Profile file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling

Surface format: FREE

Profile format: FREE

Surface station no.: 0 Upper air station no.: 23062

Name: UNKNOWN Name: DENVER WSFO, CO

Year: 2006 Year: 2006

First 24 hours of scalar data

YR MO DY JDY HR H0 U* W* DT/DZ ZICNV ZIMCH M-O LEN Z0 BOWEN ALBEDO REF WS WD HT REF TA HT

- -

06 01 01 1 01 -26.0 0.162 -9.000 -9.000 -999. 157. 11.8 0.01 1.89 1.00 4.43 326. 10.0 280.1 2.0

06 01 01 1 02 -58.1 0.325 -9.000 -9.000 -999. 445. 42.5 0.01 1.89 1.00 6.57 310. 10.0 281.4
2.0

06 01 01 1 03 -33.0 0.292 -9.000 -9.000 -999. 380. 54.5 0.01 1.89 1.00 5.72 272. 10.0 281.0
2.0

06 01 01 1 04 -14.9 0.128 -9.000 -9.000 -999. 134. 10.2 0.01 1.89 1.00 3.67 320. 10.0 279.8
2.0

06 01 01 1 05 -13.5 0.124 -9.000 -9.000 -999. 105. 10.1 0.01 1.89 1.00 3.71 337. 10.0 279.0
2.0

06 01 01 1 06 -18.3 0.176 -9.000 -9.000 -999. 177. 21.3 0.01 1.89 1.00 4.29 344. 10.0 278.3
2.0

06 01 01 1 07 -34.9 0.286 -9.000 -9.000 -999. 367. 48.1 0.01 1.89 1.00 5.68 327. 10.0 279.3
2.0

06 01 01 1 08 -39.7 0.440 -9.000 -9.000 -999. 701. 154.4 0.01 1.89 1.00 7.96 307. 10.0 279.8
2.0

06 01 01 1 09 -17.3 0.580 -9.000 -9.000 -999. 1058. 810.0 0.01 1.89 0.43 10.10 287. 10.0 279.4
2.0

06 01 01 1 10 38.3 0.682 0.602 0.005 164. 1349. -597.0 0.01 1.89 0.31 11.67 301. 10.0 280.9
2.0

06 01 01 1 11 83.4 0.893 1.120 0.005 486. 2020. -616.6 0.01 1.89 0.26 15.29 291. 10.0 281.4
2.0

06 01 01 1 12 97.2 0.889 1.326 0.005 693. 2013. -521.8 0.01 1.89 0.24 15.20 293. 10.0 281.3
2.0

06 01 01 1 13 137.5 0.968 1.629 0.005 909. 2279. -476.9 0.01 1.89 0.24 16.54 291. 10.0
281.3 2.0

06 01 01 1 14 122.9 0.912 1.653 0.005 1063. 2100. -445.7 0.01 1.89 0.25 15.56 290. 10.0
281.0 2.0

06 01 01 1 15 67.7 0.795 1.385 0.005 1138. 1727. -536.6 0.01 1.89 0.30 13.59 295. 10.0
280.1 2.0

06 01 01 1 16 0.0 0.715 -9.000 -9.000 -999. 1464. 8888.0 0.01 1.89 0.41 12.34 301. 10.0 279.0
2.0

06 01 01 1 17 0.0 0.673 -9.000 -9.000 -999. 1330. 8888.0 0.01 1.89 0.72 11.62 304. 10.0 277.1
2.0

06 01 01 1 18 0.0 0.546 -9.000 -9.000 -999. 987. 8888.0 0.01 1.89 1.00 9.43 293. 10.0 275.9
2.0

06 01 01 1 19 -46.9 0.630 -9.000 -9.000 -999. 1199. 388.5 0.01 1.89 1.00 11.09 294. 10.0 276.2
2.0

06 01 01 1 20 -49.7 0.337 -9.000 -9.000 -999. 566. 55.9 0.01 1.89 1.00 6.57 310. 10.0 275.6
2.0

06 01 01 1 21 -29.5 0.194 -9.000 -9.000 -999. 235. 17.9 0.01 1.89 1.00 4.69 313. 10.0 274.4
2.0

06 01 01 1 22 -29.9 0.238 -9.000 -9.000 -999. 279. 32.8 0.01 1.89 1.00 5.32 338. 10.0 275.8
2.0

06 01 01 1 23 -15.8 0.134 -9.000 -9.000 -999. 123. 11.1 0.01 1.89 1.00 3.67 241. 10.0 274.5
2.0

06 01 01 1 24 -19.1 0.117 -9.000 -9.000 -999. 96. 6.1 0.01 1.89 1.00 3.98 279. 10.0 273.6
2.0

First hour of profile data

YR MO DY HR HEIGHT F WDIR WSPD AMB_TMP sigmaA sigmaW sigmaV

06 01 01 01 2.0 0 -999. -99.00 280.1 99.0 -99.00 -99.00

06 01 01 01 10.0 0 326. 4.43 282.0 5.4 -99.00 0.42

06 01 01 01 60.0 1 316. 5.10 283.1 6.1 -99.00 0.54

F indicates top of profile (=1) or below (=0)

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF QUINONE IN MICROGRAMS/M**3 **

NETWORK

GROUP ID AVERAGE CONC RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

ALL 1ST HIGHEST VALUE IS 0.00051 AT (499450.00, 4508500.00, 1603.57, 1603.57, 0.00) DC

2ND HIGHEST VALUE IS 0.00049 AT (499450.00, 4508450.00, 1603.33, 1603.33, 0.00) DC

3RD HIGHEST VALUE IS 0.00049 AT (499700.00, 4508150.00, 1610.72, 1610.72, 0.00) DC

4TH HIGHEST VALUE IS 0.00048 AT (499450.00, 4508550.00, 1603.86, 1603.86, 0.00) DC

5TH HIGHEST VALUE IS 0.00048 AT (499750.00, 4508100.00, 1608.86, 1608.86, 0.00) DC

6TH HIGHEST VALUE IS 0.00047 AT (499750.00, 4508150.00, 1610.15, 1610.15, 0.00) DC

7TH HIGHEST VALUE IS 0.00047 AT (499700.00, 4508100.00, 1609.85, 1609.85, 0.00) DC

8TH HIGHEST VALUE IS 0.00047 AT (499400.00, 4508500.00, 1603.34, 1603.34, 0.00) DC

9TH HIGHEST VALUE IS 0.00046 AT (499800.00, 4508100.00, 1606.47, 1606.47, 0.00) DC

10TH HIGHEST VALUE IS 0.00046 AT (499400.00, 4508550.00, 1603.60, 1603.60, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF QUINONE IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	NETWORK RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

ALL HIGH 1ST HIGH VALUE IS 0.03479 ON 06102824: AT (499600.00, 4508200.00, 1608.71, 1608.71, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)

A Total of 624 Warning Message(s)

A Total of 142 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 1 Calm Hours Identified

A Total of 141 Missing Hours Identified (1.61 Percent)

******** FATAL ERROR MESSAGES ********

*** NONE ***

******** WARNING MESSAGES ********

ME W181 3169 MEOPEN: BULKRN Delta-T & SolarRad option for SBL was used in AERMET

MX W403 3169 PFLCNV: Turbulence data is being used w/o ADJ_U* option SigA Data

MX W479 24 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 29 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 30 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 31 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 48 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 51 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 52 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 53 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 141 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 143 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.877

MX W479 147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 151 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479	215	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	216	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.734
MX W479	221	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.535
MX W479	222	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	243	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.588
MX W479	244	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	291	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	296	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	308	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.572
MX W479	312	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	313	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.700
MX W479	314	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.735
MX W479	317	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.795
MX W479	318	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.549
MX W479	320	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	321	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.644
MX W479	340	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	342	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	344	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561
MX W479	475	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.580
MX W479	479	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	482	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.746
MX W479	483	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	484	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	486	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	487	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.681
MX W479	488	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.697
MX W479	489	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.921

MX W479	509	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.586
MX W479	524	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	526	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	527	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	528	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.926
MX W479	529	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.676
MX W479	530	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.808
MX W479	531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.740
MX W479	532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.537
MX W479	533	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.621
MX W479	534	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.830
MX W479	535	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.510
MX W479	550	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.611
MX W479	554	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.558
MX W479	555	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	556	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.743
MX W479	573	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.536
MX W479	574	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.241
MX W479	575	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	576	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.562
MX W479	577	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	578	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.213
MX W479	579	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.698
MX W479	580	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	581	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.713
MX W479	582	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.678
MX W479	583	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.869
MX W479	584	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.806

MX W479 595 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 597 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.667

MX W479 599 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.596

MX W479 600 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 601 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.705

MX W479 605 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.665

MX W479 632 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 725 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 727 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 775 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 822 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 837 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 838 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 839 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 932 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 1029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 1031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479 1034 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 1035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 1051 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 1052 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 1053 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.884

MX W479 1054 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.859

MX W479	1055	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.766
MX W479	1056	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.677
MX W479	1060	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	1061	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.639
MX W479	1197	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	1198	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.709
MX W479	1199	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	1200	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.530
MX W479	1201	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.663
MX W479	1202	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.650
MX W479	1203	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.590
MX W479	1204	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.726
MX W479	1205	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.750
MX W479	1206	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.700
MX W479	1208	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	1218	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	1219	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.824
MX W479	1220	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	1221	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.731
MX W479	1222	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	1223	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	1224	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	1225	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	1226	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753
MX W479	1227	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	1228	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	1229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602
MX W479	1230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	1231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753

MX W479 1243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 1244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 1245 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 1276 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 1277 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 1278 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.729

MX W479 1293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 1294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.851

MX W479 1295 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 1296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 1297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 1300 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 1301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.723

MX W479 1302 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 1303 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 1316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.692

MX W479 1343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 1344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.720

MX W479 1345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 1346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 1347 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.663

MX W479 1348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 1363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 1365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.696

MX W479 1373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 1374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1375 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.622

MX W479	1392	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	1394	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.577
MX W479	1395	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	1396	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.671
MX W479	1397	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	1441	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	1442	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	1483	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.647
MX W479	1532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	1537	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	1539	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.613
MX W479	1540	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	1541	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.648
MX W479	1543	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614
MX W479	1566	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.569
MX W479	1661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.575
MX W479	1989	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	1990	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	1991	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	1993	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.563
MX W479	1994	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.534
MX W479	2086	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	2088	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	2089	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	2093	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	2228	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.579
MX W479	2229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	2230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.693
MX W479	2231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.634

MX W479 2232 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.632

MX W479 2234 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 2235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 2253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 2254 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 2255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.755

MX W479 2262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 2348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 2349 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2350 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 2351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2352 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.834

MX W479 2353 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 2354 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2355 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.560

MX W479 2356 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 2373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.752

MX W479 2374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 2378 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 2379 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 2380 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 2382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 2399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.920

MX W479 2421 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2422 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 2424 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 2425 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 2428 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 2429 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 2430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 2445 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2447 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.779

MX W479 2448 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 2449 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.733

MX W479 2450 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 2468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.019

MX W479 2470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.976

MX W479 2471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.882

MX W479 2472 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.650

MX W479 2542 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.826

MX W479 2544 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 2545 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.629

MX W479 2546 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.769

MX W479 2547 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.656

MX W479 2548 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.679

MX W479 2549 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.853

MX W479 2550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2615 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 2616 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 2617 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2639 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 2640 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2641 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.777

MX W479 2643 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 2645 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 2646 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 2663 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.896

MX W479 2664 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 2666 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 2669 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 2670 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 2763 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.504

MX W479 2783 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.567

MX W479 2786 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.588

MX W479 2788 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2789 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2832 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 2833 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.506

MX W479 2900 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 2901 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.673

MX W479 2902 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.730

MX W479 2903 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 2905 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.672

MX W479 2906 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.753

MX W479 2907 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 3045 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 3047 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.554

MX W479 3048 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 3148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 3149 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 3168 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 3169 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 3170 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.601

MX W479 3171 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.796

MX W479 3172 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 3173 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.889

MX W479 3174 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 3239 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 3262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 3263 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 3289 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 3290 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 3291 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 3293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 3294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.672

MX W479 3313 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 3316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 3337 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 3338 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.521

MX W479 3339 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 3363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.584

MX W479 3364 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 3365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 3366 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 3382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 3383 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 3384 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.606

MX W479 3453 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 3454 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.711

MX W479 3457 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 3509 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.654

MX W479 3525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 3671 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.541

MX W479 3674 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 3693 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 3748 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.562

MX W479 3792 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.536

MX W479 3796 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 4029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.848

MX W479 4030 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.707

MX W479 4031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 4035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 4036 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.645

MX W479 4037 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 4057 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.502

MX W479 4080 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 4101 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.545

MX W479 4102 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 4103 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.847

MX W479 4104 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 4105 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 4172 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.682

MX W479 4173 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.824

MX W479 4227 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 4297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 4298 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.590

MX W479 4301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 4493 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 4586 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 4629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.548

MX W479 4630 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 4652 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 4653 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.685

MX W479 4654 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 4656 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 4657 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.903

MX W479 4658 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.975

MX W479 4659 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.826

MX W479 4660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.741

MX W479 4661 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.888

MX W479 4677 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.524

MX W479 4679 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 4680 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.591

MX W479 4685 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.731

MX W479 4724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 4996 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.544

MX W479 5331 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.662

MX W479 5332 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 5471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 5472 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 5475 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 5614 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.669

MX W479 5615 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 5621 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 5622 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.623

MX W479 5790 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 5804 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 5805 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 5809 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 5812 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.675

MX W479 5813 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.645

MX W479 5814 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.523

MX W479 5979 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 5980 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 6120 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 6121 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 6125 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 6126 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 6142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 6146 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 6147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.573

MX W479 6148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.779

MX W479 6149 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.883

MX W479 6150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.860

MX W479 6267 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 6268 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 6271 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 6286 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 6292 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.577

MX W479 6294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.615

MX W479 6405 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 6406 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.887

MX W479 6407 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 6408 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.541

MX W479 6409 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 6410 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.740

MX W479 6411 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 6413 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 6430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479	6431	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	6435	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.023
MX W479	6436	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	6486	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	6501	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.822
MX W479	6524	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.557
MX W479	6525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.600
MX W479	6526	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	6528	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.612
MX W479	6529	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	6530	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	6531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.662
MX W479	6532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.680
MX W479	6548	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.718
MX W479	6549	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.739
MX W479	6550	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.767
MX W479	6553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.592
MX W479	6554	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.776
MX W479	6555	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.581
MX W479	6556	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	6558	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.988
MX W479	6559	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.766
MX W479	6571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	6572	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.870
MX W479	6573	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.668
MX W479	6574	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.705
MX W479	6577	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.791
MX W479	6578	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	6579	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.622

MX W479 6580 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 6581 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.872

MX W479 6582 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.704

MX W479 6583 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 6596 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 6602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 6791 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.545

MX W479 6835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.564

MX W479 6836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 6868 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 6870 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 6890 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 6912 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 6913 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 6914 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.591

MX W479 6915 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 6917 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 6918 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 7014 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 7099 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.534

MX W479 7100 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.759

MX W479 7101 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7103 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 7111 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 7123 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 7126 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 7127 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 7129 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.509

MX W479 7130 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 7131 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 7132 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 7195 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.554

MX W479 7196 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 7199 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.566

MX W479 7207 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 7220 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 7243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.628

MX W479 7244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 7246 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 7252 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.629

MX W479 7253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 7255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.681

MX W479 7316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.757

MX W479 7317 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 7318 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.570

MX W479 7319 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 7321 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 7323 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 7324 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 7326 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 7340 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.691

MX W479 7343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 7345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.627

MX W479 7346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 7351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 7363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 7364 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.215

MX W479 7366 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 7367 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.612

MX W479 7368 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.799

MX W479 7369 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.518

MX W479 7388 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 7389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 7390 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 7391 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.797

MX W479 7393 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7395 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 7396 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 7397 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 7399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.656

MX W479 7400 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.686

MX W479 7446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.641

MX W479 7462 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.761

MX W479 7468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 7469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.811

MX W479 7470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.856

MX W479 7471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.803

MX W479 7484 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 7513 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 7514 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 7531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.594

MX W479 7543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 7585 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.532

MX W479 7586 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.831

MX W479 7587 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.573

MX W479 7602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 7603 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 7660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.708

MX W479 7661 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 7681 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 7682 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7683 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.707

MX W479 7684 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.628

MX W479 7753 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.641

MX W479 7755 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.502

MX W479 7794 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 7796 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.032

MX W479 7797 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.212

MX W479 7798 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.800

MX W479 7801 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.637

MX W479 7802 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.906

MX W479 7803 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 7804 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.841

MX W479 7805 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.048

MX W479 7806 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.021

MX W479 7807 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.755

MX W479 7819 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.902

MX W479 7867 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.583

MX W479 7869 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 7873 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 7878 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 7879 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 7891 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 7892 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.532

MX W479 7894 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.509

MX W479 7896 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 7897 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.506

MX W479 7898 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.761

MX W479 7899 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.773

MX W479 7900 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 7901 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.852

MX W479 7941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 7948 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 7989 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 7990 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 7991 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.627

MX W479 7992 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.622

MX W479 7993 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.288

MX W479 7994 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 7996 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.606

MX W479 8011 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 8041 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 8042 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 8062 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 8067 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 8086 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 8087 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.504

MX W479 8088 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.618

MX W479 8089 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 8090 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 8091 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.523

MX W479 8107 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 8108 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 8111 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.564

MX W479 8112 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 8116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 8117 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.838

MX W479 8118 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 8119 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.001

MX W479 8120 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.649

MX W479 8190 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 8191 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 8192 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 8202 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.572

MX W479 8203 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.563

MX W479 8204 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.511

MX W479 8206 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 8208 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.642

MX W479 8209 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.717

MX W479 8210 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.670

MX W479 8211 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 8213 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.701

MX W479 8214 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.584

MX W479 8215 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.714

MX W479 8216 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.687

MX W479 8229 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 8230 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 8231 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 8235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 8238 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 8301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.642

MX W479 8304 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 8306 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.685

MX W479 8307 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479	8311	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.550
MX W479	8350	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.596
MX W479	8356	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.511
MX W479	8358	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	8360	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	8427	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.593
MX W479	8428	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.548
MX W479	8442	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	8445	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	8447	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	8448	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	8450	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	8451	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.695
MX W479	8452	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.533
MX W479	8514	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	8553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.944
MX W479	8567	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.619
MX W479	8570	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.535
MX W479	8571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	8595	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626
MX W479	8646	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	8660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.567
MX W479	8730	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	8734	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	8735	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.560
MX W479	8760	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** MODEL SETUP OPTIONS SUMMARY ***

** Model Options Selected:

* Model Uses Regulatory DEFAULT Options
* Model Is Setup For Calculation of Average CONCentration Values.
* NO GAS DEPOSITION Data Provided.
* NO PARTICLE DEPOSITION Data Provided.
* Model Uses NO DRY DEPLETION. DDPLETE = F
* Model Uses NO WET DEPLETION. WETDPLT = F
* Stack-tip Downwash.
* Model Accounts for ELEVated Terrain Effects.
* Use Calms Processing Routine.
* Use Missing Data Processing Routine.
* No Exponential Decay.
* Model Uses RURAL Dispersion Only.
* BULKRN - Use BULKRN Delta-T and SolarRad option for SBL in AERMET
* Model Assumes No FLAGPOLE Receptor Heights.
* The User Specified a Pollutant Type of: BENZENE

**Model Calculates 1 Short Term Average(s) of: 1-HR
and Calculates ANNUAL Averages

**This Run Includes: 1 Source(s); 1 Source Group(s); and 3106 Receptor(s)

with: 1 POINT(s), including

0 POINTCAP(s) and 0 POINTHOR(s)

and: 0 VOLUME source(s)

and: 0 AREA type source(s)

and: 0 LINE source(s)

and: 0 RLINE/RLINEXT source(s)

and: 0 OPENPIT source(s)

and: 0 BUOYANT LINE source(s) with a total of 0 line(s)

and: 0 SWPOINT source(s)

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 22112

**Output Options Selected:

Model Outputs Tables of ANNUAL Averages by Receptor

Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours

m for Missing Hours

b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1730.68 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0

Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07

Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 3.9 MB of RAM.

**Input Runstream File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**Output Print File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**File for Summary of Results: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***

(1=YES; 0=NO)

1 1 1

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***

(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:21:42

PAGE 3

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling Met Version: 22112

Profile file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling

Surface format: FREE

Profile format: FREE

Surface station no.: 0 Upper air station no.: 23062

Name: UNKNOWN Name: DENVER WSFO, CO

Year: 2006 Year: 2006

First 24 hours of scalar data

YR MO DY JDY HR H0 U* W* DT/DZ ZICNV ZIMCH M-O LEN Z0 BOWEN ALBEDO REF WS WD HT REF TA HT

- -

06 01 01 1 01 -26.0 0.162 -9.000 -9.000 -999. 157. 11.8 0.01 1.89 1.00 4.43 326. 10.0 280.1 2.0

06 01 01 1 02 -58.1 0.325 -9.000 -9.000 -999. 445. 42.5 0.01 1.89 1.00 6.57 310. 10.0 281.4
2.0

06 01 01 1 03 -33.0 0.292 -9.000 -9.000 -999. 380. 54.5 0.01 1.89 1.00 5.72 272. 10.0 281.0
2.0

06 01 01 1 04 -14.9 0.128 -9.000 -9.000 -999. 134. 10.2 0.01 1.89 1.00 3.67 320. 10.0 279.8
2.0

06 01 01 1 05 -13.5 0.124 -9.000 -9.000 -999. 105. 10.1 0.01 1.89 1.00 3.71 337. 10.0 279.0
2.0

06 01 01 1 06 -18.3 0.176 -9.000 -9.000 -999. 177. 21.3 0.01 1.89 1.00 4.29 344. 10.0 278.3
2.0

06 01 01 1 07 -34.9 0.286 -9.000 -9.000 -999. 367. 48.1 0.01 1.89 1.00 5.68 327. 10.0 279.3
2.0

06 01 01 1 08 -39.7 0.440 -9.000 -9.000 -999. 701. 154.4 0.01 1.89 1.00 7.96 307. 10.0 279.8
2.0

06 01 01 1 09 -17.3 0.580 -9.000 -9.000 -999. 1058. 810.0 0.01 1.89 0.43 10.10 287. 10.0 279.4
2.0

06 01 01 1 10 38.3 0.682 0.602 0.005 164. 1349. -597.0 0.01 1.89 0.31 11.67 301. 10.0 280.9
2.0

06 01 01 1 11 83.4 0.893 1.120 0.005 486. 2020. -616.6 0.01 1.89 0.26 15.29 291. 10.0 281.4
2.0

06 01 01 1 12 97.2 0.889 1.326 0.005 693. 2013. -521.8 0.01 1.89 0.24 15.20 293. 10.0 281.3
2.0

06 01 01 1 13 137.5 0.968 1.629 0.005 909. 2279. -476.9 0.01 1.89 0.24 16.54 291. 10.0
281.3 2.0

06 01 01 1 14 122.9 0.912 1.653 0.005 1063. 2100. -445.7 0.01 1.89 0.25 15.56 290. 10.0
281.0 2.0

06 01 01 1 15 67.7 0.795 1.385 0.005 1138. 1727. -536.6 0.01 1.89 0.30 13.59 295. 10.0
280.1 2.0

06 01 01 1 16 0.0 0.715 -9.000 -9.000 -999. 1464. 8888.0 0.01 1.89 0.41 12.34 301. 10.0 279.0
2.0

06 01 01 1 17 0.0 0.673 -9.000 -9.000 -999. 1330. 8888.0 0.01 1.89 0.72 11.62 304. 10.0 277.1
2.0

06 01 01 1 18 0.0 0.546 -9.000 -9.000 -999. 987. 8888.0 0.01 1.89 1.00 9.43 293. 10.0 275.9
2.0

06 01 01 1 19 -46.9 0.630 -9.000 -9.000 -999. 1199. 388.5 0.01 1.89 1.00 11.09 294. 10.0 276.2
2.0

06 01 01 1 20 -49.7 0.337 -9.000 -9.000 -999. 566. 55.9 0.01 1.89 1.00 6.57 310. 10.0 275.6
2.0

06 01 01 1 21 -29.5 0.194 -9.000 -9.000 -999. 235. 17.9 0.01 1.89 1.00 4.69 313. 10.0 274.4
2.0

06 01 01 1 22 -29.9 0.238 -9.000 -9.000 -999. 279. 32.8 0.01 1.89 1.00 5.32 338. 10.0 275.8
2.0

06 01 01 1 23 -15.8 0.134 -9.000 -9.000 -999. 123. 11.1 0.01 1.89 1.00 3.67 241. 10.0 274.5
2.0

06 01 01 1 24 -19.1 0.117 -9.000 -9.000 -999. 96. 6.1 0.01 1.89 1.00 3.98 279. 10.0 273.6
2.0

First hour of profile data

YR MO DY HR HEIGHT F WDIR WSPD AMB_TMP sigmaA sigmaW sigmaV

06 01 01 01 2.0 0 -999. -99.00 280.1 99.0 -99.00 -99.00

06 01 01 01 10.0 0 326. 4.43 282.0 5.4 -99.00 0.42

06 01 01 01 60.0 1 316. 5.10 283.1 6.1 -99.00 0.54

F indicates top of profile (=1) or below (=0)

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF BENZENE IN MICROGRAMS/M**3 **

NETWORK

GROUP ID AVERAGE CONC RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

ALL 1ST HIGHEST VALUE IS 0.00052 AT (499450.00, 4508500.00, 1603.57, 1603.57, 0.00) DC

2ND HIGHEST VALUE IS 0.00051 AT (499450.00, 4508450.00, 1603.33, 1603.33, 0.00) DC

3RD HIGHEST VALUE IS 0.00051 AT (499700.00, 4508150.00, 1610.72, 1610.72, 0.00) DC

4TH HIGHEST VALUE IS 0.00050 AT (499450.00, 4508550.00, 1603.86, 1603.86, 0.00) DC

5TH HIGHEST VALUE IS 0.00049 AT (499750.00, 4508100.00, 1608.86, 1608.86, 0.00) DC

6TH HIGHEST VALUE IS 0.00049 AT (499750.00, 4508150.00, 1610.15, 1610.15, 0.00) DC

7TH HIGHEST VALUE IS 0.00049 AT (499700.00, 4508100.00, 1609.85, 1609.85, 0.00) DC

8TH HIGHEST VALUE IS 0.00048 AT (499400.00, 4508500.00, 1603.34, 1603.34, 0.00) DC

9TH HIGHEST VALUE IS 0.00048 AT (499800.00, 4508100.00, 1606.47, 1606.47, 0.00) DC

10TH HIGHEST VALUE IS 0.00047 AT (499400.00, 4508550.00, 1603.60, 1603.60, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF BENZENE IN MICROGRAMS/M**3 **

DATE NETWORK

GROUP ID AVERAGE CONC (YYMMDDHH) RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

- -

ALL HIGH 1ST HIGH VALUE IS 0.03608 ON 06102824: AT (499600.00, 4508200.00, 1608.71, 1608.71, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:21:42

PAGE 6

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)

A Total of 624 Warning Message(s)

A Total of 142 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 1 Calm Hours Identified

A Total of 141 Missing Hours Identified (1.61 Percent)

******** FATAL ERROR MESSAGES ********

*** NONE ***

******** WARNING MESSAGES ********

ME W181 3169 MEOPEN: BULKRN Delta-T & SolarRad option for SBL was used in AERMET

MX W403 3169 PFLCNV: Turbulence data is being used w/o ADJ_U* option SigA Data

MX W479 24 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 29 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 30 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 31 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 48 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 51 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 52 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 53 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 141 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 143 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.877

MX W479 147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 151 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479	215	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	216	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.734
MX W479	221	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.535
MX W479	222	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	243	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.588
MX W479	244	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	291	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	296	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	308	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.572
MX W479	312	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	313	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.700
MX W479	314	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.735
MX W479	317	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.795
MX W479	318	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.549
MX W479	320	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	321	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.644
MX W479	340	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	342	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	344	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561
MX W479	475	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.580
MX W479	479	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	482	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.746
MX W479	483	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	484	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	486	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	487	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.681
MX W479	488	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.697
MX W479	489	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.921

MX W479	509	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.586
MX W479	524	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	526	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	527	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	528	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.926
MX W479	529	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.676
MX W479	530	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.808
MX W479	531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.740
MX W479	532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.537
MX W479	533	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.621
MX W479	534	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.830
MX W479	535	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.510
MX W479	550	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.611
MX W479	554	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.558
MX W479	555	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	556	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.743
MX W479	573	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.536
MX W479	574	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.241
MX W479	575	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	576	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.562
MX W479	577	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	578	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.213
MX W479	579	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.698
MX W479	580	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	581	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.713
MX W479	582	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.678
MX W479	583	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.869
MX W479	584	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.806

MX W479 595 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 597 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.667

MX W479 599 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.596

MX W479 600 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 601 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.705

MX W479 605 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.665

MX W479 632 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 725 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 727 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 775 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 822 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 837 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 838 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 839 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 932 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 1029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 1031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479 1034 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 1035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 1051 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 1052 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 1053 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.884

MX W479 1054 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.859

MX W479 1055 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.766

MX W479 1056 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.677

MX W479 1060 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 1061 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.639

MX W479 1197 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 1198 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.709

MX W479 1199 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.645

MX W479 1200 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.530

MX W479 1201 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.663

MX W479 1202 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.650

MX W479 1203 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.590

MX W479 1204 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.726

MX W479 1205 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.750

MX W479 1206 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.700

MX W479 1208 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 1218 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 1219 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.824

MX W479 1220 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 1221 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.731

MX W479 1222 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 1223 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 1224 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 1225 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 1226 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.753

MX W479 1227 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.778

MX W479 1228 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 1229 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 1230 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 1231 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.753

MX W479 1243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 1244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 1245 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 1276 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 1277 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 1278 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.729

MX W479 1293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 1294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.851

MX W479 1295 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 1296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 1297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 1300 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 1301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.723

MX W479 1302 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 1303 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 1316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.692

MX W479 1343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 1344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.720

MX W479 1345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 1346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 1347 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.663

MX W479 1348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 1363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 1365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.696

MX W479 1373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 1374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1375 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.622

MX W479	1392	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	1394	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.577
MX W479	1395	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	1396	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.671
MX W479	1397	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	1441	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	1442	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	1483	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.647
MX W479	1532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	1537	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	1539	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.613
MX W479	1540	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	1541	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.648
MX W479	1543	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614
MX W479	1566	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.569
MX W479	1661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.575
MX W479	1989	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	1990	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	1991	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	1993	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.563
MX W479	1994	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.534
MX W479	2086	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	2088	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	2089	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	2093	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	2228	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.579
MX W479	2229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	2230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.693
MX W479	2231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.634

MX W479 2232 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.632

MX W479 2234 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 2235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 2253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 2254 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 2255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.755

MX W479 2262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 2348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 2349 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2350 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 2351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2352 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.834

MX W479 2353 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 2354 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2355 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.560

MX W479 2356 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 2373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.752

MX W479 2374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 2378 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 2379 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 2380 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 2382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 2399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.920

MX W479 2421 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2422 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 2424 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 2425 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 2428 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 2429 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 2430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 2445 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2447 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.779

MX W479 2448 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 2449 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.733

MX W479 2450 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 2468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.019

MX W479 2470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.976

MX W479 2471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.882

MX W479 2472 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.650

MX W479 2542 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.826

MX W479 2544 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 2545 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.629

MX W479 2546 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.769

MX W479 2547 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.656

MX W479 2548 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.679

MX W479 2549 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.853

MX W479 2550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2615 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 2616 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 2617 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2639 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 2640 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2641 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.777

MX W479 2643 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 2645 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 2646 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 2663 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.896

MX W479 2664 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 2666 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 2669 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 2670 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 2763 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.504

MX W479 2783 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.567

MX W479 2786 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.588

MX W479 2788 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2789 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2832 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 2833 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.506

MX W479 2900 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 2901 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.673

MX W479 2902 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.730

MX W479 2903 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 2905 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.672

MX W479 2906 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.753

MX W479 2907 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 3045 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 3047 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.554

MX W479 3048 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 3148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 3149 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 3168 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 3169 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 3170 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.601

MX W479 3171 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.796

MX W479 3172 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 3173 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.889

MX W479 3174 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 3239 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 3262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 3263 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 3289 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 3290 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 3291 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 3293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 3294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.672

MX W479 3313 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 3316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 3337 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 3338 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.521

MX W479 3339 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 3363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.584

MX W479 3364 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 3365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 3366 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 3382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 3383 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 3384 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.606

MX W479 3453 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 3454 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.711

MX W479 3457 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 3509 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.654

MX W479 3525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 3671 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.541

MX W479 3674 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 3693 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 3748 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.562

MX W479 3792 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.536

MX W479 3796 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 4029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.848

MX W479 4030 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.707

MX W479 4031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 4035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 4036 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.645

MX W479 4037 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 4057 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.502

MX W479 4080 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 4101 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.545

MX W479 4102 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 4103 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.847

MX W479 4104 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 4105 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 4172 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.682

MX W479 4173 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.824

MX W479 4227 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 4297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 4298 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.590

MX W479 4301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 4493 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 4586 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 4629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.548

MX W479 4630 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 4652 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 4653 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.685

MX W479 4654 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 4656 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 4657 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.903

MX W479 4658 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.975

MX W479 4659 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.826

MX W479 4660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.741

MX W479 4661 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.888

MX W479 4677 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.524

MX W479 4679 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 4680 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.591

MX W479 4685 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.731

MX W479 4724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 4996 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.544

MX W479 5331 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.662

MX W479 5332 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 5471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 5472 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 5475 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 5614 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.669

MX W479 5615 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 5621 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 5622 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.623

MX W479 5790 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 5804 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 5805 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 5809 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 5812 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.675

MX W479 5813 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.645

MX W479 5814 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.523

MX W479 5979 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 5980 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 6120 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 6121 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 6125 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 6126 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 6142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 6146 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 6147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.573

MX W479 6148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.779

MX W479 6149 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.883

MX W479 6150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.860

MX W479 6267 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 6268 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 6271 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 6286 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 6292 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.577

MX W479 6294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.615

MX W479 6405 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 6406 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.887

MX W479 6407 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 6408 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.541

MX W479 6409 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 6410 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.740

MX W479 6411 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 6413 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 6430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479 6431 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.841

MX W479 6435 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.023

MX W479 6436 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.778

MX W479 6486 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 6501 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.822

MX W479 6524 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 6525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.600

MX W479 6526 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.566

MX W479 6528 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.612

MX W479 6529 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.627

MX W479 6530 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 6531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.662

MX W479 6532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.680

MX W479 6548 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.718

MX W479 6549 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.739

MX W479 6550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.767

MX W479 6553 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 6554 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.776

MX W479 6555 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 6556 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 6558 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.988

MX W479 6559 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.766

MX W479 6571 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.523

MX W479 6572 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.870

MX W479 6573 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.668

MX W479 6574 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.705

MX W479 6577 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.791

MX W479 6578 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 6579 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.622

MX W479 6580 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 6581 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.872

MX W479 6582 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.704

MX W479 6583 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 6596 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 6602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 6791 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.545

MX W479 6835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.564

MX W479 6836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 6868 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 6870 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 6890 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 6912 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 6913 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 6914 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.591

MX W479 6915 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 6917 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 6918 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 7014 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 7099 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.534

MX W479 7100 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.759

MX W479 7101 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7103 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 7111 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 7123 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 7126 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 7127 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 7129 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.509

MX W479 7130 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 7131 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 7132 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 7195 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.554

MX W479 7196 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 7199 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.566

MX W479 7207 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 7220 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 7243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.628

MX W479 7244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 7246 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 7252 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.629

MX W479 7253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 7255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.681

MX W479 7316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.757

MX W479 7317 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 7318 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.570

MX W479 7319 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 7321 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 7323 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 7324 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 7326 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 7340 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.691

MX W479 7343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 7345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.627

MX W479 7346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 7351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 7363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 7364 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.215

MX W479 7366 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 7367 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.612

MX W479 7368 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.799

MX W479 7369 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.518

MX W479 7388 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 7389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 7390 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 7391 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.797

MX W479 7393 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7395 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 7396 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 7397 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 7399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.656

MX W479 7400 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.686

MX W479 7446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.641

MX W479 7462 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.761

MX W479 7468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 7469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.811

MX W479 7470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.856

MX W479 7471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.803

MX W479 7484 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 7513 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 7514 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 7531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.594

MX W479 7543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 7585 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.532

MX W479 7586 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.831

MX W479 7587 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.573

MX W479 7602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 7603 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 7660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.708

MX W479 7661 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 7681 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 7682 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7683 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.707

MX W479 7684 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.628

MX W479 7753 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.641

MX W479 7755 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.502

MX W479 7794 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 7796 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.032

MX W479 7797 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.212

MX W479 7798 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.800

MX W479 7801 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.637

MX W479 7802 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.906

MX W479 7803 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 7804 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.841

MX W479 7805 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.048

MX W479 7806 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.021

MX W479 7807 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.755

MX W479 7819 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.902

MX W479 7867 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.583

MX W479 7869 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 7873 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 7878 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 7879 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 7891 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 7892 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.532

MX W479 7894 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.509

MX W479 7896 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 7897 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.506

MX W479 7898 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.761

MX W479 7899 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.773

MX W479 7900 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 7901 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.852

MX W479 7941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 7948 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 7989 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 7990 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 7991 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.627

MX W479 7992 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.622

MX W479 7993 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.288

MX W479 7994 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 7996 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.606

MX W479 8011 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 8041 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 8042 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 8062 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 8067 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 8086 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 8087 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.504

MX W479 8088 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.618

MX W479 8089 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 8090 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 8091 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.523

MX W479 8107 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 8108 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 8111 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.564

MX W479 8112 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 8116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 8117 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.838

MX W479 8118 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 8119 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.001

MX W479 8120 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.649

MX W479 8190 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 8191 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 8192 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 8202 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.572

MX W479 8203 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.563

MX W479 8204 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.511

MX W479 8206 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 8208 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.642

MX W479 8209 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.717

MX W479 8210 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.670

MX W479 8211 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 8213 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.701

MX W479 8214 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.584

MX W479 8215 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.714

MX W479 8216 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.687

MX W479 8229 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 8230 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 8231 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 8235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 8238 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 8301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.642

MX W479 8304 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 8306 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.685

MX W479 8307 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 8311 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.550

MX W479 8350 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.596

MX W479 8356 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.511

MX W479 8358 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 8360 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 8427 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.593

MX W479 8428 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.548

MX W479 8442 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.566

MX W479 8445 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 8447 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 8448 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.591

MX W479 8450 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.583

MX W479 8451 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.695

MX W479 8452 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.533

MX W479 8514 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 8553 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.944

MX W479 8567 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.619

MX W479 8570 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 8571 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.544

MX W479 8595 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.626

MX W479 8646 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 8660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.567

MX W479 8730 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 8734 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.672

MX W479 8735 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.560

MX W479 8760 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.626

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** MODEL SETUP OPTIONS SUMMARY ***

** Model Options Selected:

* Model Uses Regulatory DEFAULT Options
* Model Is Setup For Calculation of Average CONCentration Values.
* NO GAS DEPOSITION Data Provided.
* NO PARTICLE DEPOSITION Data Provided.
* Model Uses NO DRY DEPLETION. DDPLETE = F
* Model Uses NO WET DEPLETION. WETDPLT = F
* Stack-tip Downwash.
* Model Accounts for ELEVated Terrain Effects.
* Use Calms Processing Routine.
* Use Missing Data Processing Routine.
* No Exponential Decay.
* Model Uses RURAL Dispersion Only.
* BULKRN - Use BULKRN Delta-T and SolarRad option for SBL in AERMET
* Model Assumes No FLAGPOLE Receptor Heights.
* The User Specified a Pollutant Type of: ETHYLBEN

**Model Calculates 1 Short Term Average(s) of: 1-HR
and Calculates ANNUAL Averages

**This Run Includes: 1 Source(s); 1 Source Group(s); and 3106 Receptor(s)

with: 1 POINT(s), including

0 POINTCAP(s) and 0 POINTHOR(s)

and: 0 VOLUME source(s)

and: 0 AREA type source(s)

and: 0 LINE source(s)

and: 0 RLINE/RLINEXT source(s)

and: 0 OPENPIT source(s)

and: 0 BUOYANT LINE source(s) with a total of 0 line(s)

and: 0 SWPOINT source(s)

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 22112

**Output Options Selected:

Model Outputs Tables of ANNUAL Averages by Receptor

Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours

m for Missing Hours

b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1730.68 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0

Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07

Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 3.9 MB of RAM.

**Input Runstream File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**Output Print File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**File for Summary of Results: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***

(1=YES; 0=NO)

1 1 1

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***

(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:22:23

PAGE 3

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling Met Version: 22112

Profile file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling

Surface format: FREE

Profile format: FREE

Surface station no.: 0 Upper air station no.: 23062

Name: UNKNOWN Name: DENVER WSFO, CO

Year: 2006 Year: 2006

First 24 hours of scalar data

YR MO DY JDY HR H0 U* W* DT/DZ ZICNV ZIMCH M-O LEN Z0 BOWEN ALBEDO REF WS WD HT REF TA HT

- -

06 01 01 1 01 -26.0 0.162 -9.000 -9.000 -999. 157. 11.8 0.01 1.89 1.00 4.43 326. 10.0 280.1 2.0

06 01 01 1 02 -58.1 0.325 -9.000 -9.000 -999. 445. 42.5 0.01 1.89 1.00 6.57 310. 10.0 281.4
2.0

06 01 01 1 03 -33.0 0.292 -9.000 -9.000 -999. 380. 54.5 0.01 1.89 1.00 5.72 272. 10.0 281.0
2.0

06 01 01 1 04 -14.9 0.128 -9.000 -9.000 -999. 134. 10.2 0.01 1.89 1.00 3.67 320. 10.0 279.8
2.0

06 01 01 1 05 -13.5 0.124 -9.000 -9.000 -999. 105. 10.1 0.01 1.89 1.00 3.71 337. 10.0 279.0
2.0

06 01 01 1 06 -18.3 0.176 -9.000 -9.000 -999. 177. 21.3 0.01 1.89 1.00 4.29 344. 10.0 278.3
2.0

06 01 01 1 07 -34.9 0.286 -9.000 -9.000 -999. 367. 48.1 0.01 1.89 1.00 5.68 327. 10.0 279.3
2.0

06 01 01 1 08 -39.7 0.440 -9.000 -9.000 -999. 701. 154.4 0.01 1.89 1.00 7.96 307. 10.0 279.8
2.0

06 01 01 1 09 -17.3 0.580 -9.000 -9.000 -999. 1058. 810.0 0.01 1.89 0.43 10.10 287. 10.0 279.4
2.0

06 01 01 1 10 38.3 0.682 0.602 0.005 164. 1349. -597.0 0.01 1.89 0.31 11.67 301. 10.0 280.9
2.0

06 01 01 1 11 83.4 0.893 1.120 0.005 486. 2020. -616.6 0.01 1.89 0.26 15.29 291. 10.0 281.4
2.0

06 01 01 1 12 97.2 0.889 1.326 0.005 693. 2013. -521.8 0.01 1.89 0.24 15.20 293. 10.0 281.3
2.0

06 01 01 1 13 137.5 0.968 1.629 0.005 909. 2279. -476.9 0.01 1.89 0.24 16.54 291. 10.0
281.3 2.0

06 01 01 1 14 122.9 0.912 1.653 0.005 1063. 2100. -445.7 0.01 1.89 0.25 15.56 290. 10.0
281.0 2.0

06 01 01 1 15 67.7 0.795 1.385 0.005 1138. 1727. -536.6 0.01 1.89 0.30 13.59 295. 10.0
280.1 2.0

06 01 01 1 16 0.0 0.715 -9.000 -9.000 -999. 1464. 8888.0 0.01 1.89 0.41 12.34 301. 10.0 279.0
2.0

06 01 01 1 17 0.0 0.673 -9.000 -9.000 -999. 1330. 8888.0 0.01 1.89 0.72 11.62 304. 10.0 277.1
2.0

06 01 01 1 18 0.0 0.546 -9.000 -9.000 -999. 987. 8888.0 0.01 1.89 1.00 9.43 293. 10.0 275.9
2.0

06 01 01 1 19 -46.9 0.630 -9.000 -9.000 -999. 1199. 388.5 0.01 1.89 1.00 11.09 294. 10.0 276.2
2.0

06 01 01 1 20 -49.7 0.337 -9.000 -9.000 -999. 566. 55.9 0.01 1.89 1.00 6.57 310. 10.0 275.6
2.0

06 01 01 1 21 -29.5 0.194 -9.000 -9.000 -999. 235. 17.9 0.01 1.89 1.00 4.69 313. 10.0 274.4
2.0

06 01 01 1 22 -29.9 0.238 -9.000 -9.000 -999. 279. 32.8 0.01 1.89 1.00 5.32 338. 10.0 275.8
2.0

06 01 01 1 23 -15.8 0.134 -9.000 -9.000 -999. 123. 11.1 0.01 1.89 1.00 3.67 241. 10.0 274.5
2.0

06 01 01 1 24 -19.1 0.117 -9.000 -9.000 -999. 96. 6.1 0.01 1.89 1.00 3.98 279. 10.0 273.6
2.0

First hour of profile data

YR MO DY HR HEIGHT F WDIR WSPD AMB_TMP sigmaA sigmaW sigmaV

06 01 01 01 2.0 0 -999. -99.00 280.1 99.0 -99.00 -99.00

06 01 01 01 10.0 0 326. 4.43 282.0 5.4 -99.00 0.42

06 01 01 01 60.0 1 316. 5.10 283.1 6.1 -99.00 0.54

F indicates top of profile (=1) or below (=0)

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:22:23

PAGE 4

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF ETHYLBEN IN MICROGRAMS/M**3 **

NETWORK

GROUP ID AVERAGE CONC RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

ALL 1ST HIGHEST VALUE IS 0.00412 AT (499450.00, 4508500.00, 1603.57, 1603.57, 0.00) DC

2ND HIGHEST VALUE IS 0.00403 AT (499450.00, 4508450.00, 1603.33, 1603.33, 0.00) DC

3RD HIGHEST VALUE IS 0.00400 AT (499700.00, 4508150.00, 1610.72, 1610.72, 0.00) DC

4TH HIGHEST VALUE IS 0.00392 AT (499450.00, 4508550.00, 1603.86, 1603.86, 0.00) DC

5TH HIGHEST VALUE IS 0.00388 AT (499750.00, 4508100.00, 1608.86, 1608.86, 0.00) DC

6TH HIGHEST VALUE IS 0.00383 AT (499750.00, 4508150.00, 1610.15, 1610.15, 0.00) DC

7TH HIGHEST VALUE IS 0.00381 AT (499700.00, 4508100.00, 1609.85, 1609.85, 0.00) DC

8TH HIGHEST VALUE IS 0.00379 AT (499400.00, 4508500.00, 1603.34, 1603.34, 0.00) DC

9TH HIGHEST VALUE IS 0.00377 AT (499800.00, 4508100.00, 1606.47, 1606.47, 0.00) DC

10TH HIGHEST VALUE IS 0.00371 AT (499400.00, 4508550.00, 1603.60, 1603.60, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF ETHYLBEN IN MICROGRAMS/M**3 **

DATE NETWORK

GROUP ID AVERAGE CONC (YYMMDDHH) RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

- -

ALL HIGH 1ST HIGH VALUE IS 0.28349 ON 06102824: AT (499600.00, 4508200.00, 1608.71, 1608.71, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:22:23

PAGE 6

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)

A Total of 624 Warning Message(s)

A Total of 142 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 1 Calm Hours Identified

A Total of 141 Missing Hours Identified (1.61 Percent)

******** FATAL ERROR MESSAGES ********

*** NONE ***

******** WARNING MESSAGES ********

ME W181 3169 MEOPEN: BULKRN Delta-T & SolarRad option for SBL was used in AERMET

MX W403 3169 PFLCNV: Turbulence data is being used w/o ADJ_U* option SigA Data

MX W479 24 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 29 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 30 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 31 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 48 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 51 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 52 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 53 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 141 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 143 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.877

MX W479 147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 151 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479	215	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	216	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.734
MX W479	221	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.535
MX W479	222	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	243	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.588
MX W479	244	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	291	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	296	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	308	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.572
MX W479	312	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	313	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.700
MX W479	314	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.735
MX W479	317	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.795
MX W479	318	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.549
MX W479	320	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	321	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.644
MX W479	340	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	342	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	344	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561
MX W479	475	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.580
MX W479	479	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	482	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.746
MX W479	483	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	484	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	486	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	487	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.681
MX W479	488	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.697
MX W479	489	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.921

MX W479	509	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.586
MX W479	524	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	526	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	527	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	528	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.926
MX W479	529	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.676
MX W479	530	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.808
MX W479	531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.740
MX W479	532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.537
MX W479	533	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.621
MX W479	534	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.830
MX W479	535	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.510
MX W479	550	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.611
MX W479	554	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.558
MX W479	555	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	556	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.743
MX W479	573	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.536
MX W479	574	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.241
MX W479	575	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	576	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.562
MX W479	577	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	578	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.213
MX W479	579	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.698
MX W479	580	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	581	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.713
MX W479	582	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.678
MX W479	583	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.869
MX W479	584	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.806

MX W479 595 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 597 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.667

MX W479 599 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.596

MX W479 600 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 601 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.705

MX W479 605 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.665

MX W479 632 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 725 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 727 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 775 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 822 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 837 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 838 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 839 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 932 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 1029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 1031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479 1034 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 1035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 1051 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 1052 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 1053 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.884

MX W479 1054 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.859

MX W479 1055 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.766

MX W479 1056 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.677

MX W479 1060 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 1061 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.639

MX W479 1197 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 1198 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.709

MX W479 1199 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.645

MX W479 1200 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.530

MX W479 1201 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.663

MX W479 1202 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.650

MX W479 1203 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.590

MX W479 1204 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.726

MX W479 1205 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.750

MX W479 1206 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.700

MX W479 1208 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 1218 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 1219 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.824

MX W479 1220 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 1221 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.731

MX W479 1222 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 1223 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 1224 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 1225 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 1226 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.753

MX W479 1227 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.778

MX W479 1228 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 1229 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 1230 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 1231 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.753

MX W479 1243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 1244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 1245 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 1276 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 1277 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 1278 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.729

MX W479 1293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 1294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.851

MX W479 1295 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 1296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 1297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 1300 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 1301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.723

MX W479 1302 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 1303 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 1316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.692

MX W479 1343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 1344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.720

MX W479 1345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 1346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 1347 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.663

MX W479 1348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 1363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 1365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.696

MX W479 1373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 1374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1375 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.622

MX W479 1392 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 1394 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.577

MX W479 1395 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 1396 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 1397 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 1441 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 1442 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1483 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 1532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 1537 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1539 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 1540 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 1541 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 1543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 1566 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 1661 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 1989 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 1990 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 1991 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.509

MX W479 1993 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.563

MX W479 1994 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.534

MX W479 2086 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 2088 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 2089 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 2093 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 2228 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.579

MX W479 2229 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 2230 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.693

MX W479 2231 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 2232 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.632

MX W479 2234 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 2235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 2253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 2254 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 2255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.755

MX W479 2262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 2348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 2349 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2350 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 2351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2352 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.834

MX W479 2353 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 2354 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2355 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.560

MX W479 2356 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 2373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.752

MX W479 2374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 2378 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 2379 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 2380 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 2382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 2399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.920

MX W479 2421 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2422 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 2424 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 2425 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 2428 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 2429 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 2430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 2445 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2447 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.779

MX W479 2448 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 2449 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.733

MX W479 2450 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 2468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.019

MX W479 2470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.976

MX W479 2471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.882

MX W479 2472 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.650

MX W479 2542 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.826

MX W479 2544 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 2545 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.629

MX W479 2546 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.769

MX W479 2547 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.656

MX W479 2548 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.679

MX W479 2549 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.853

MX W479 2550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2615 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 2616 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 2617 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2639 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 2640 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2641 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.777

MX W479 2643 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 2645 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 2646 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 2663 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.896

MX W479 2664 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 2666 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 2669 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 2670 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 2763 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.504

MX W479 2783 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.567

MX W479 2786 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.588

MX W479 2788 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2789 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2832 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 2833 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.506

MX W479 2900 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 2901 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.673

MX W479 2902 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.730

MX W479 2903 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 2905 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.672

MX W479 2906 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.753

MX W479 2907 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 3045 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 3047 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.554

MX W479 3048 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 3148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 3149 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 3168 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 3169 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 3170 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.601

MX W479 3171 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.796

MX W479 3172 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 3173 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.889

MX W479 3174 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 3239 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 3262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 3263 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 3289 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 3290 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 3291 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 3293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 3294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.672

MX W479 3313 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 3316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 3337 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 3338 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.521

MX W479 3339 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 3363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.584

MX W479 3364 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 3365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 3366 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 3382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 3383 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 3384 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.606

MX W479 3453 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 3454 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.711

MX W479 3457 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 3509 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.654

MX W479 3525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 3671 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.541

MX W479 3674 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 3693 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 3748 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.562

MX W479 3792 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.536

MX W479 3796 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 4029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.848

MX W479 4030 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.707

MX W479 4031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 4035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 4036 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.645

MX W479 4037 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 4057 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.502

MX W479 4080 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 4101 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.545

MX W479 4102 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 4103 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.847

MX W479 4104 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 4105 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 4172 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.682

MX W479 4173 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.824

MX W479 4227 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 4297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 4298 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.590

MX W479 4301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 4493 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 4586 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 4629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.548

MX W479 4630 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 4652 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 4653 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.685

MX W479 4654 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 4656 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 4657 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.903

MX W479 4658 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.975

MX W479 4659 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.826

MX W479 4660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.741

MX W479 4661 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.888

MX W479 4677 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.524

MX W479 4679 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 4680 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.591

MX W479 4685 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.731

MX W479 4724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 4996 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.544

MX W479 5331 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.662

MX W479 5332 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 5471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 5472 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 5475 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 5614 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.669

MX W479 5615 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 5621 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 5622 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.623

MX W479 5790 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 5804 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 5805 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 5809 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 5812 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.675

MX W479	5813	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	5814	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	5979	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	5980	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.546
MX W479	6120	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	6121	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.501
MX W479	6125	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	6126	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	6142	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	6146	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.582
MX W479	6147	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.573
MX W479	6148	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.779
MX W479	6149	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.883
MX W479	6150	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.860
MX W479	6267	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.540
MX W479	6268	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	6271	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.529
MX W479	6286	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.595
MX W479	6292	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.577
MX W479	6294	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.615
MX W479	6405	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.611
MX W479	6406	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.887
MX W479	6407	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	6408	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.541
MX W479	6409	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	6410	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.740
MX W479	6411	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	6413	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	6430	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.587

MX W479	6431	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	6435	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.023
MX W479	6436	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	6486	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	6501	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.822
MX W479	6524	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.557
MX W479	6525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.600
MX W479	6526	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	6528	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.612
MX W479	6529	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	6530	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	6531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.662
MX W479	6532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.680
MX W479	6548	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.718
MX W479	6549	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.739
MX W479	6550	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.767
MX W479	6553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.592
MX W479	6554	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.776
MX W479	6555	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.581
MX W479	6556	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	6558	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.988
MX W479	6559	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.766
MX W479	6571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	6572	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.870
MX W479	6573	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.668
MX W479	6574	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.705
MX W479	6577	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.791
MX W479	6578	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	6579	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.622

MX W479 6580 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 6581 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.872

MX W479 6582 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.704

MX W479 6583 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 6596 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 6602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 6791 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.545

MX W479 6835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.564

MX W479 6836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 6868 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 6870 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 6890 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 6912 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 6913 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 6914 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.591

MX W479 6915 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 6917 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 6918 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 7014 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 7099 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.534

MX W479 7100 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.759

MX W479 7101 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7103 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 7111 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 7123 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 7126 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 7127 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 7129 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.509

MX W479 7130 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 7131 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 7132 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 7195 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.554

MX W479 7196 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 7199 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.566

MX W479 7207 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 7220 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 7243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.628

MX W479 7244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 7246 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 7252 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.629

MX W479 7253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 7255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.681

MX W479 7316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.757

MX W479 7317 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 7318 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.570

MX W479 7319 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 7321 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 7323 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 7324 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 7326 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 7340 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.691

MX W479 7343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 7345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.627

MX W479 7346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 7351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 7363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 7364 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.215

MX W479 7366 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 7367 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.612

MX W479 7368 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.799

MX W479 7369 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.518

MX W479 7388 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 7389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 7390 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 7391 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.797

MX W479 7393 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7395 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 7396 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 7397 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 7399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.656

MX W479 7400 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.686

MX W479 7446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.641

MX W479 7462 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.761

MX W479 7468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 7469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.811

MX W479 7470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.856

MX W479 7471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.803

MX W479 7484 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 7513 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 7514 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 7531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.594

MX W479 7543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 7585 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.532

MX W479 7586 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.831

MX W479 7587 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.573

MX W479 7602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 7603 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 7660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.708

MX W479 7661 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 7681 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 7682 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7683 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.707

MX W479 7684 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.628

MX W479 7753 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.641

MX W479 7755 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.502

MX W479 7794 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 7796 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.032

MX W479 7797 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.212

MX W479 7798 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.800

MX W479 7801 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.637

MX W479 7802 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.906

MX W479 7803 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 7804 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.841

MX W479 7805 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.048

MX W479 7806 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.021

MX W479 7807 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.755

MX W479 7819 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.902

MX W479 7867 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.583

MX W479 7869 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 7873 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 7878 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 7879 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 7891 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 7892 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.532

MX W479 7894 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.509

MX W479 7896 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 7897 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.506

MX W479 7898 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.761

MX W479 7899 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.773

MX W479 7900 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 7901 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.852

MX W479 7941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 7948 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 7989 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 7990 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 7991 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.627

MX W479 7992 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.622

MX W479 7993 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.288

MX W479 7994 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 7996 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.606

MX W479 8011 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 8041 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 8042 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 8062 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 8067 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 8086 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 8087 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.504

MX W479 8088 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.618

MX W479 8089 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 8090 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 8091 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.523

MX W479 8107 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 8108 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 8111 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.564

MX W479 8112 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 8116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 8117 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.838

MX W479 8118 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 8119 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.001

MX W479 8120 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.649

MX W479 8190 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 8191 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 8192 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 8202 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.572

MX W479 8203 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.563

MX W479 8204 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.511

MX W479 8206 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 8208 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.642

MX W479 8209 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.717

MX W479 8210 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.670

MX W479 8211 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 8213 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.701

MX W479 8214 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.584

MX W479 8215 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.714

MX W479 8216 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.687

MX W479 8229 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 8230 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 8231 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 8235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 8238 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 8301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.642

MX W479 8304 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 8306 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.685

MX W479 8307 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479	8311	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.550
MX W479	8350	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.596
MX W479	8356	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.511
MX W479	8358	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	8360	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	8427	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.593
MX W479	8428	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.548
MX W479	8442	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	8445	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	8447	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	8448	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	8450	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	8451	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.695
MX W479	8452	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.533
MX W479	8514	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	8553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.944
MX W479	8567	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.619
MX W479	8570	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.535
MX W479	8571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	8595	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626
MX W479	8646	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	8660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.567
MX W479	8730	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	8734	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	8735	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.560
MX W479	8760	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** MODEL SETUP OPTIONS SUMMARY ***

** Model Options Selected:

* Model Uses Regulatory DEFAULT Options
* Model Is Setup For Calculation of Average CONCentration Values.
* NO GAS DEPOSITION Data Provided.
* NO PARTICLE DEPOSITION Data Provided.
* Model Uses NO DRY DEPLETION. DDPLETE = F
* Model Uses NO WET DEPLETION. WETDPLT = F
* Stack-tip Downwash.
* Model Accounts for ELEVated Terrain Effects.
* Use Calms Processing Routine.
* Use Missing Data Processing Routine.
* No Exponential Decay.
* Model Uses RURAL Dispersion Only.
* BULKRN - Use BULKRN Delta-T and SolarRad option for SBL in AERMET
* Model Assumes No FLAGPOLE Receptor Heights.
* The User Specified a Pollutant Type of: XYLENE

**Model Calculates 1 Short Term Average(s) of: 1-HR
and Calculates ANNUAL Averages

**This Run Includes: 1 Source(s); 1 Source Group(s); and 3106 Receptor(s)

with: 1 POINT(s), including

0 POINTCAP(s) and 0 POINTHOR(s)

and: 0 VOLUME source(s)

and: 0 AREA type source(s)

and: 0 LINE source(s)

and: 0 RLINE/RLINEXT source(s)

and: 0 OPENPIT source(s)

and: 0 BUOYANT LINE source(s) with a total of 0 line(s)

and: 0 SWPOINT source(s)

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 22112

**Output Options Selected:

Model Outputs Tables of ANNUAL Averages by Receptor

Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours

m for Missing Hours

b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1730.68 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0

Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07

Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 3.9 MB of RAM.

**Input Runstream File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**Output Print File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**File for Summary of Results: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***

(1=YES; 0=NO)

1 1 1

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***

(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:23:03

PAGE 3

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling Met Version: 22112

Profile file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling

Surface format: FREE

Profile format: FREE

Surface station no.: 0 Upper air station no.: 23062

Name: UNKNOWN Name: DENVER WSFO, CO

Year: 2006 Year: 2006

First 24 hours of scalar data

YR MO DY JDY HR H0 U* W* DT/DZ ZICNV ZIMCH M-O LEN Z0 BOWEN ALBEDO REF WS WD HT REF TA HT

- -

06 01 01 1 01 -26.0 0.162 -9.000 -9.000 -999. 157. 11.8 0.01 1.89 1.00 4.43 326. 10.0 280.1 2.0

06 01 01 1 02 -58.1 0.325 -9.000 -9.000 -999. 445. 42.5 0.01 1.89 1.00 6.57 310. 10.0 281.4
2.0

06 01 01 1 03 -33.0 0.292 -9.000 -9.000 -999. 380. 54.5 0.01 1.89 1.00 5.72 272. 10.0 281.0
2.0

06 01 01 1 04 -14.9 0.128 -9.000 -9.000 -999. 134. 10.2 0.01 1.89 1.00 3.67 320. 10.0 279.8
2.0

06 01 01 1 05 -13.5 0.124 -9.000 -9.000 -999. 105. 10.1 0.01 1.89 1.00 3.71 337. 10.0 279.0
2.0

06 01 01 1 06 -18.3 0.176 -9.000 -9.000 -999. 177. 21.3 0.01 1.89 1.00 4.29 344. 10.0 278.3
2.0

06 01 01 1 07 -34.9 0.286 -9.000 -9.000 -999. 367. 48.1 0.01 1.89 1.00 5.68 327. 10.0 279.3
2.0

06 01 01 1 08 -39.7 0.440 -9.000 -9.000 -999. 701. 154.4 0.01 1.89 1.00 7.96 307. 10.0 279.8
2.0

06 01 01 1 09 -17.3 0.580 -9.000 -9.000 -999. 1058. 810.0 0.01 1.89 0.43 10.10 287. 10.0 279.4
2.0

06 01 01 1 10 38.3 0.682 0.602 0.005 164. 1349. -597.0 0.01 1.89 0.31 11.67 301. 10.0 280.9
2.0

06 01 01 1 11 83.4 0.893 1.120 0.005 486. 2020. -616.6 0.01 1.89 0.26 15.29 291. 10.0 281.4
2.0

06 01 01 1 12 97.2 0.889 1.326 0.005 693. 2013. -521.8 0.01 1.89 0.24 15.20 293. 10.0 281.3
2.0

06 01 01 1 13 137.5 0.968 1.629 0.005 909. 2279. -476.9 0.01 1.89 0.24 16.54 291. 10.0
281.3 2.0

06 01 01 1 14 122.9 0.912 1.653 0.005 1063. 2100. -445.7 0.01 1.89 0.25 15.56 290. 10.0
281.0 2.0

06 01 01 1 15 67.7 0.795 1.385 0.005 1138. 1727. -536.6 0.01 1.89 0.30 13.59 295. 10.0
280.1 2.0

06 01 01 1 16 0.0 0.715 -9.000 -9.000 -999. 1464. 8888.0 0.01 1.89 0.41 12.34 301. 10.0 279.0
2.0

06 01 01 1 17 0.0 0.673 -9.000 -9.000 -999. 1330. 8888.0 0.01 1.89 0.72 11.62 304. 10.0 277.1
2.0

06 01 01 1 18 0.0 0.546 -9.000 -9.000 -999. 987. 8888.0 0.01 1.89 1.00 9.43 293. 10.0 275.9
2.0

06 01 01 1 19 -46.9 0.630 -9.000 -9.000 -999. 1199. 388.5 0.01 1.89 1.00 11.09 294. 10.0 276.2
2.0

06 01 01 1 20 -49.7 0.337 -9.000 -9.000 -999. 566. 55.9 0.01 1.89 1.00 6.57 310. 10.0 275.6
2.0

06 01 01 1 21 -29.5 0.194 -9.000 -9.000 -999. 235. 17.9 0.01 1.89 1.00 4.69 313. 10.0 274.4
2.0

06 01 01 1 22 -29.9 0.238 -9.000 -9.000 -999. 279. 32.8 0.01 1.89 1.00 5.32 338. 10.0 275.8
2.0

06 01 01 1 23 -15.8 0.134 -9.000 -9.000 -999. 123. 11.1 0.01 1.89 1.00 3.67 241. 10.0 274.5
2.0

06 01 01 1 24 -19.1 0.117 -9.000 -9.000 -999. 96. 6.1 0.01 1.89 1.00 3.98 279. 10.0 273.6
2.0

First hour of profile data

YR MO DY HR HEIGHT F WDIR WSPD AMB_TMP sigmaA sigmaW sigmaV

06 01 01 01 2.0 0 -999. -99.00 280.1 99.0 -99.00 -99.00

06 01 01 01 10.0 0 326. 4.43 282.0 5.4 -99.00 0.42

06 01 01 01 60.0 1 316. 5.10 283.1 6.1 -99.00 0.54

F indicates top of profile (=1) or below (=0)

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF XYLENE IN MICROGRAMS/M**3 **

NETWORK

GROUP ID AVERAGE CONC RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

ALL 1ST HIGHEST VALUE IS 0.00505 AT (499450.00, 4508500.00, 1603.57, 1603.57, 0.00) DC

2ND HIGHEST VALUE IS 0.00494 AT (499450.00, 4508450.00, 1603.33, 1603.33, 0.00) DC

3RD HIGHEST VALUE IS 0.00491 AT (499700.00, 4508150.00, 1610.72, 1610.72, 0.00) DC

4TH HIGHEST VALUE IS 0.00481 AT (499450.00, 4508550.00, 1603.86, 1603.86, 0.00) DC

5TH HIGHEST VALUE IS 0.00476 AT (499750.00, 4508100.00, 1608.86, 1608.86, 0.00) DC

6TH HIGHEST VALUE IS 0.00470 AT (499750.00, 4508150.00, 1610.15, 1610.15, 0.00) DC

7TH HIGHEST VALUE IS 0.00468 AT (499700.00, 4508100.00, 1609.85, 1609.85, 0.00) DC

8TH HIGHEST VALUE IS 0.00465 AT (499400.00, 4508500.00, 1603.34, 1603.34, 0.00) DC

9TH HIGHEST VALUE IS 0.00463 AT (499800.00, 4508100.00, 1606.47, 1606.47, 0.00) DC

10TH HIGHEST VALUE IS 0.00455 AT (499400.00, 4508550.00, 1603.60, 1603.60, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF XYLENE IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	NETWORK RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

ALL HIGH 1ST HIGH VALUE IS 0.34792 ON 06102824: AT (499600.00, 4508200.00, 1608.71, 1608.71, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)

A Total of 624 Warning Message(s)

A Total of 142 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 1 Calm Hours Identified

A Total of 141 Missing Hours Identified (1.61 Percent)

******** FATAL ERROR MESSAGES ********

*** NONE ***

******** WARNING MESSAGES ********

ME W181 3169 MEOPEN: BULKRN Delta-T & SolarRad option for SBL was used in AERMET

MX W403 3169 PFLCNV: Turbulence data is being used w/o ADJ_U* option SigA Data

MX W479 24 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 29 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 30 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 31 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 48 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 51 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 52 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 53 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 141 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 143 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.877

MX W479 147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 151 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479	215	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	216	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.734
MX W479	221	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.535
MX W479	222	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	243	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.588
MX W479	244	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	291	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	296	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	308	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.572
MX W479	312	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	313	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.700
MX W479	314	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.735
MX W479	317	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.795
MX W479	318	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.549
MX W479	320	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	321	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.644
MX W479	340	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	342	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	344	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561
MX W479	475	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.580
MX W479	479	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	482	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.746
MX W479	483	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	484	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	486	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	487	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.681
MX W479	488	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.697
MX W479	489	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.921

MX W479 509 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586
MX W479 524 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527
MX W479 525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519
MX W479 526 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597
MX W479 527 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519
MX W479 528 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.926
MX W479 529 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.676
MX W479 530 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.808
MX W479 531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.740
MX W479 532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.537
MX W479 533 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.621
MX W479 534 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.830
MX W479 535 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510
MX W479 550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611
MX W479 554 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558
MX W479 555 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719
MX W479 556 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743
MX W479 573 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.536
MX W479 574 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.241
MX W479 575 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721
MX W479 576 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.562
MX W479 577 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559
MX W479 578 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.213
MX W479 579 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698
MX W479 580 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597
MX W479 581 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.713
MX W479 582 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.678
MX W479 583 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.869
MX W479 584 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 595 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 597 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.667

MX W479 599 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.596

MX W479 600 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 601 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.705

MX W479 605 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.665

MX W479 632 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 725 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 727 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 775 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 822 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 837 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 838 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 839 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 932 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 1029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 1031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479 1034 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 1035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 1051 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 1052 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 1053 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.884

MX W479 1054 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.859

MX W479	1055	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.766
MX W479	1056	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.677
MX W479	1060	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	1061	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.639
MX W479	1197	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	1198	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.709
MX W479	1199	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	1200	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.530
MX W479	1201	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.663
MX W479	1202	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.650
MX W479	1203	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.590
MX W479	1204	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.726
MX W479	1205	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.750
MX W479	1206	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.700
MX W479	1208	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	1218	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	1219	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.824
MX W479	1220	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	1221	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.731
MX W479	1222	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	1223	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	1224	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	1225	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	1226	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753
MX W479	1227	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	1228	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	1229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602
MX W479	1230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	1231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753

MX W479 1243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 1244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 1245 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 1276 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 1277 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 1278 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.729

MX W479 1293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 1294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.851

MX W479 1295 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 1296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 1297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 1300 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 1301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.723

MX W479 1302 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 1303 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 1316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.692

MX W479 1343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 1344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.720

MX W479 1345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 1346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 1347 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.663

MX W479 1348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 1363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 1365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.696

MX W479 1373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 1374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1375 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.622

MX W479 1392 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 1394 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.577

MX W479 1395 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 1396 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 1397 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 1441 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 1442 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1483 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 1532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 1537 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1539 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 1540 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 1541 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 1543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 1566 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 1661 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 1989 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 1990 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 1991 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.509

MX W479 1993 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.563

MX W479 1994 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.534

MX W479 2086 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 2088 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 2089 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 2093 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 2228 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.579

MX W479 2229 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 2230 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.693

MX W479 2231 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 2232 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.632

MX W479 2234 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 2235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 2253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 2254 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 2255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.755

MX W479 2262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 2348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 2349 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2350 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 2351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2352 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.834

MX W479 2353 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 2354 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2355 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.560

MX W479 2356 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 2373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.752

MX W479 2374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 2378 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 2379 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 2380 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 2382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 2399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.920

MX W479 2421 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2422 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 2424 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 2425 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 2428 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 2429 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 2430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 2445 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2447 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.779

MX W479 2448 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 2449 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.733

MX W479 2450 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 2468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.019

MX W479 2470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.976

MX W479 2471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.882

MX W479 2472 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.650

MX W479 2542 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.826

MX W479 2544 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 2545 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.629

MX W479 2546 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.769

MX W479 2547 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.656

MX W479 2548 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.679

MX W479 2549 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.853

MX W479 2550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2615 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 2616 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 2617 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2639 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 2640 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2641 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.777

MX W479 2643 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 2645 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 2646 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 2663 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.896

MX W479 2664 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 2666 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 2669 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 2670 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 2763 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.504

MX W479 2783 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.567

MX W479 2786 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.588

MX W479 2788 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2789 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2832 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 2833 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.506

MX W479 2900 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 2901 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.673

MX W479 2902 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.730

MX W479 2903 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 2905 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.672

MX W479 2906 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.753

MX W479 2907 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 3045 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 3047 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.554

MX W479 3048 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 3148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 3149 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 3168 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 3169 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 3170 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.601

MX W479 3171 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.796

MX W479 3172 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 3173 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.889

MX W479 3174 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 3239 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 3262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 3263 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 3289 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 3290 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 3291 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 3293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 3294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.672

MX W479 3313 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 3316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 3337 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 3338 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.521

MX W479 3339 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 3363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.584

MX W479 3364 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 3365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 3366 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 3382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 3383 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 3384 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.606

MX W479 3453 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 3454 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.711

MX W479 3457 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 3509 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.654

MX W479 3525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479	3671	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.541
MX W479	3674	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	3693	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	3748	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.562
MX W479	3792	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.536
MX W479	3796	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.568
MX W479	4029	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.848
MX W479	4030	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.707
MX W479	4031	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	4035	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	4036	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	4037	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	4057	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.502
MX W479	4080	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	4101	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.545
MX W479	4102	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	4103	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.847
MX W479	4104	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.608
MX W479	4105	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	4172	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.682
MX W479	4173	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.824
MX W479	4227	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	4297	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	4298	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.590
MX W479	4301	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.582
MX W479	4493	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.603
MX W479	4586	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	4629	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.548
MX W479	4630	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.517

MX W479 4652 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 4653 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.685

MX W479 4654 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 4656 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 4657 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.903

MX W479 4658 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.975

MX W479 4659 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.826

MX W479 4660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.741

MX W479 4661 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.888

MX W479 4677 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.524

MX W479 4679 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 4680 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.591

MX W479 4685 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.731

MX W479 4724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 4996 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.544

MX W479 5331 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.662

MX W479 5332 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 5471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 5472 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 5475 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 5614 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.669

MX W479 5615 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 5621 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 5622 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.623

MX W479 5790 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 5804 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 5805 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 5809 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 5812 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.675

MX W479 5813 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.645

MX W479 5814 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.523

MX W479 5979 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 5980 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 6120 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 6121 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 6125 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 6126 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 6142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 6146 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 6147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.573

MX W479 6148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.779

MX W479 6149 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.883

MX W479 6150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.860

MX W479 6267 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 6268 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 6271 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 6286 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 6292 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.577

MX W479 6294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.615

MX W479 6405 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 6406 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.887

MX W479 6407 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 6408 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.541

MX W479 6409 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 6410 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.740

MX W479 6411 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 6413 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 6430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479	6431	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	6435	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.023
MX W479	6436	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	6486	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	6501	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.822
MX W479	6524	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.557
MX W479	6525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.600
MX W479	6526	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	6528	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.612
MX W479	6529	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	6530	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	6531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.662
MX W479	6532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.680
MX W479	6548	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.718
MX W479	6549	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.739
MX W479	6550	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.767
MX W479	6553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.592
MX W479	6554	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.776
MX W479	6555	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.581
MX W479	6556	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	6558	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.988
MX W479	6559	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.766
MX W479	6571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	6572	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.870
MX W479	6573	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.668
MX W479	6574	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.705
MX W479	6577	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.791
MX W479	6578	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	6579	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.622

MX W479 6580 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 6581 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.872

MX W479 6582 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.704

MX W479 6583 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 6596 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 6602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 6791 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.545

MX W479 6835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.564

MX W479 6836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 6868 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 6870 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 6890 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 6912 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 6913 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 6914 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.591

MX W479 6915 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 6917 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 6918 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 7014 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 7099 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.534

MX W479 7100 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.759

MX W479 7101 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7103 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 7111 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 7123 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 7126 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 7127 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 7129 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.509

MX W479 7130 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 7131 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 7132 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 7195 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.554

MX W479 7196 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 7199 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.566

MX W479 7207 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 7220 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 7243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.628

MX W479 7244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 7246 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 7252 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.629

MX W479 7253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 7255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.681

MX W479 7316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.757

MX W479 7317 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 7318 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.570

MX W479 7319 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 7321 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 7323 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 7324 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 7326 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 7340 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.691

MX W479 7343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 7345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.627

MX W479 7346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 7351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 7363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 7364 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.215

MX W479 7366 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 7367 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.612

MX W479 7368 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.799

MX W479 7369 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.518

MX W479 7388 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 7389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 7390 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 7391 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.797

MX W479 7393 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7395 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 7396 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 7397 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 7399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.656

MX W479 7400 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.686

MX W479 7446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.641

MX W479 7462 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.761

MX W479 7468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 7469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.811

MX W479 7470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.856

MX W479 7471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.803

MX W479 7484 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 7513 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 7514 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 7531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.594

MX W479 7543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 7585 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.532

MX W479 7586 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.831

MX W479 7587 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.573

MX W479 7602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 7603 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 7660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.708

MX W479 7661 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 7681 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 7682 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7683 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.707

MX W479 7684 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.628

MX W479 7753 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.641

MX W479 7755 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.502

MX W479 7794 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 7796 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.032

MX W479 7797 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.212

MX W479 7798 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.800

MX W479 7801 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.637

MX W479 7802 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.906

MX W479 7803 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 7804 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.841

MX W479 7805 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.048

MX W479 7806 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.021

MX W479 7807 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.755

MX W479 7819 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.902

MX W479 7867 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.583

MX W479 7869 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 7873 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 7878 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 7879 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 7891 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 7892 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.532

MX W479 7894 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.509

MX W479 7896 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 7897 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.506

MX W479 7898 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.761

MX W479 7899 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.773

MX W479 7900 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 7901 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.852

MX W479 7941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 7948 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 7989 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 7990 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 7991 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.627

MX W479 7992 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.622

MX W479 7993 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.288

MX W479 7994 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 7996 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.606

MX W479 8011 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 8041 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 8042 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 8062 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 8067 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 8086 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 8087 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.504

MX W479 8088 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.618

MX W479 8089 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 8090 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 8091 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.523

MX W479 8107 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 8108 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 8111 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.564

MX W479 8112 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 8116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 8117 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.838

MX W479 8118 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 8119 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.001

MX W479 8120 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.649

MX W479 8190 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 8191 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 8192 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 8202 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.572

MX W479 8203 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.563

MX W479 8204 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.511

MX W479 8206 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 8208 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.642

MX W479 8209 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.717

MX W479 8210 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.670

MX W479 8211 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 8213 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.701

MX W479 8214 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.584

MX W479 8215 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.714

MX W479 8216 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.687

MX W479 8229 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 8230 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 8231 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 8235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 8238 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 8301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.642

MX W479 8304 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 8306 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.685

MX W479 8307 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479	8311	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.550
MX W479	8350	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.596
MX W479	8356	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.511
MX W479	8358	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	8360	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	8427	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.593
MX W479	8428	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.548
MX W479	8442	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	8445	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	8447	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	8448	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	8450	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	8451	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.695
MX W479	8452	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.533
MX W479	8514	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	8553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.944
MX W479	8567	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.619
MX W479	8570	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.535
MX W479	8571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	8595	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626
MX W479	8646	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	8660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.567
MX W479	8730	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	8734	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	8735	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.560
MX W479	8760	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** MODEL SETUP OPTIONS SUMMARY ***

** Model Options Selected:

* Model Uses Regulatory DEFAULT Options
* Model Is Setup For Calculation of Average CONCentration Values.
* NO GAS DEPOSITION Data Provided.
* NO PARTICLE DEPOSITION Data Provided.
* Model Uses NO DRY DEPLETION. DDPLETE = F
* Model Uses NO WET DEPLETION. WETDPLT = F
* Stack-tip Downwash.
* Model Accounts for ELEVated Terrain Effects.
* Use Calms Processing Routine.
* Use Missing Data Processing Routine.
* No Exponential Decay.
* Model Uses RURAL Dispersion Only.
* BULKRN - Use BULKRN Delta-T and SolarRad option for SBL in AERMET
* Model Assumes No FLAGPOLE Receptor Heights.
* The User Specified a Pollutant Type of: TOTALPAH

**Model Calculates 1 Short Term Average(s) of: 1-HR
and Calculates ANNUAL Averages

**This Run Includes: 1 Source(s); 1 Source Group(s); and 3106 Receptor(s)

with: 1 POINT(s), including

0 POINTCAP(s) and 0 POINTHOR(s)

and: 0 VOLUME source(s)

and: 0 AREA type source(s)

and: 0 LINE source(s)

and: 0 RLINE/RLINEXT source(s)

and: 0 OPENPIT source(s)

and: 0 BUOYANT LINE source(s) with a total of 0 line(s)

and: 0 SWPOINT source(s)

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 22112

**Output Options Selected:

Model Outputs Tables of ANNUAL Averages by Receptor

Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours

m for Missing Hours

b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1730.68 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0

Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07

Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 3.9 MB of RAM.

**Input Runstream File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**Output Print File: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

**File for Summary of Results: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\Revision 50\Connell_BEEST_Emi

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***

(1=YES; 0=NO)

1 1 1

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***

(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:23:44

PAGE 3

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling Met Version: 22112

Profile file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling

Surface format: FREE

Profile format: FREE

Surface station no.: 0 Upper air station no.: 23062

Name: UNKNOWN Name: DENVER WSFO, CO

Year: 2006 Year: 2006

First 24 hours of scalar data

YR MO DY JDY HR H0 U* W* DT/DZ ZICNV ZIMCH M-O LEN Z0 BOWEN ALBEDO REF WS WD HT REF TA HT

- -

06 01 01 1 01 -26.0 0.162 -9.000 -9.000 -999. 157. 11.8 0.01 1.89 1.00 4.43 326. 10.0 280.1 2.0

06 01 01 1 02 -58.1 0.325 -9.000 -9.000 -999. 445. 42.5 0.01 1.89 1.00 6.57 310. 10.0 281.4
2.0

06 01 01 1 03 -33.0 0.292 -9.000 -9.000 -999. 380. 54.5 0.01 1.89 1.00 5.72 272. 10.0 281.0
2.0

06 01 01 1 04 -14.9 0.128 -9.000 -9.000 -999. 134. 10.2 0.01 1.89 1.00 3.67 320. 10.0 279.8
2.0

06 01 01 1 05 -13.5 0.124 -9.000 -9.000 -999. 105. 10.1 0.01 1.89 1.00 3.71 337. 10.0 279.0
2.0

06 01 01 1 06 -18.3 0.176 -9.000 -9.000 -999. 177. 21.3 0.01 1.89 1.00 4.29 344. 10.0 278.3
2.0

06 01 01 1 07 -34.9 0.286 -9.000 -9.000 -999. 367. 48.1 0.01 1.89 1.00 5.68 327. 10.0 279.3
2.0

06 01 01 1 08 -39.7 0.440 -9.000 -9.000 -999. 701. 154.4 0.01 1.89 1.00 7.96 307. 10.0 279.8
2.0

06 01 01 1 09 -17.3 0.580 -9.000 -9.000 -999. 1058. 810.0 0.01 1.89 0.43 10.10 287. 10.0 279.4
2.0

06 01 01 1 10 38.3 0.682 0.602 0.005 164. 1349. -597.0 0.01 1.89 0.31 11.67 301. 10.0 280.9
2.0

06 01 01 1 11 83.4 0.893 1.120 0.005 486. 2020. -616.6 0.01 1.89 0.26 15.29 291. 10.0 281.4
2.0

06 01 01 1 12 97.2 0.889 1.326 0.005 693. 2013. -521.8 0.01 1.89 0.24 15.20 293. 10.0 281.3
2.0

06 01 01 1 13 137.5 0.968 1.629 0.005 909. 2279. -476.9 0.01 1.89 0.24 16.54 291. 10.0
281.3 2.0

06 01 01 1 14 122.9 0.912 1.653 0.005 1063. 2100. -445.7 0.01 1.89 0.25 15.56 290. 10.0
281.0 2.0

06 01 01 1 15 67.7 0.795 1.385 0.005 1138. 1727. -536.6 0.01 1.89 0.30 13.59 295. 10.0
280.1 2.0

06 01 01 1 16 0.0 0.715 -9.000 -9.000 -999. 1464. 8888.0 0.01 1.89 0.41 12.34 301. 10.0 279.0
2.0

06 01 01 1 17 0.0 0.673 -9.000 -9.000 -999. 1330. 8888.0 0.01 1.89 0.72 11.62 304. 10.0 277.1
2.0

06 01 01 1 18 0.0 0.546 -9.000 -9.000 -999. 987. 8888.0 0.01 1.89 1.00 9.43 293. 10.0 275.9
2.0

06 01 01 1 19 -46.9 0.630 -9.000 -9.000 -999. 1199. 388.5 0.01 1.89 1.00 11.09 294. 10.0 276.2
2.0

06 01 01 1 20 -49.7 0.337 -9.000 -9.000 -999. 566. 55.9 0.01 1.89 1.00 6.57 310. 10.0 275.6
2.0

06 01 01 1 21 -29.5 0.194 -9.000 -9.000 -999. 235. 17.9 0.01 1.89 1.00 4.69 313. 10.0 274.4
2.0

06 01 01 1 22 -29.9 0.238 -9.000 -9.000 -999. 279. 32.8 0.01 1.89 1.00 5.32 338. 10.0 275.8
2.0

06 01 01 1 23 -15.8 0.134 -9.000 -9.000 -999. 123. 11.1 0.01 1.89 1.00 3.67 241. 10.0 274.5
2.0

06 01 01 1 24 -19.1 0.117 -9.000 -9.000 -999. 96. 6.1 0.01 1.89 1.00 3.98 279. 10.0 273.6
2.0

First hour of profile data

YR MO DY HR HEIGHT F WDIR WSPD AMB_TMP sigmaA sigmaW sigmaV

06 01 01 01 2.0 0 -999. -99.00 280.1 99.0 -99.00 -99.00

06 01 01 01 10.0 0 326. 4.43 282.0 5.4 -99.00 0.42

06 01 01 01 60.0 1 316. 5.10 283.1 6.1 -99.00 0.54

F indicates top of profile (=1) or below (=0)

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:23:44

PAGE 4

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF TOTALPAH IN MICROGRAMS/M**3 **

NETWORK

GROUP ID AVERAGE CONC RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

ALL 1ST HIGHEST VALUE IS 0.00043 AT (499450.00, 4508500.00, 1603.57, 1603.57, 0.00) DC

2ND HIGHEST VALUE IS 0.00042 AT (499450.00, 4508450.00, 1603.33, 1603.33, 0.00) DC

3RD HIGHEST VALUE IS 0.00042 AT (499700.00, 4508150.00, 1610.72, 1610.72, 0.00) DC

4TH HIGHEST VALUE IS 0.00041 AT (499450.00, 4508550.00, 1603.86, 1603.86, 0.00) DC

5TH HIGHEST VALUE IS 0.00041 AT (499750.00, 4508100.00, 1608.86, 1608.86, 0.00) DC

6TH HIGHEST VALUE IS 0.00040 AT (499750.00, 4508150.00, 1610.15, 1610.15, 0.00) DC

7TH HIGHEST VALUE IS 0.00040 AT (499700.00, 4508100.00, 1609.85, 1609.85, 0.00) DC

8TH HIGHEST VALUE IS 0.00040 AT (499400.00, 4508500.00, 1603.34, 1603.34, 0.00) DC

9TH HIGHEST VALUE IS 0.00039 AT (499800.00, 4508100.00, 1606.47, 1606.47, 0.00) DC

10TH HIGHEST VALUE IS 0.00039 AT (499400.00, 4508550.00, 1603.60, 1603.60, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF TOTALPAH IN MICROGRAMS/M**3 **

DATE NETWORK

GROUP ID AVERAGE CONC (YYMMDDHH) RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

- -

ALL HIGH 1ST HIGH VALUE IS 0.02964 ON 06102824: AT (499600.00, 4508200.00, 1608.71, 1608.71, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** AERMOD - VERSION 22112 *** *** Title One *** 05/09/23

*** AERMET - VERSION 22112 *** *** *** 15:23:44

PAGE 6

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)

A Total of 624 Warning Message(s)

A Total of 142 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 1 Calm Hours Identified

A Total of 141 Missing Hours Identified (1.61 Percent)

******** FATAL ERROR MESSAGES ********

*** NONE ***

******** WARNING MESSAGES ********

ME W181 3169 MEOPEN: BULKRN Delta-T & SolarRad option for SBL was used in AERMET

MX W403 3169 PFLCNV: Turbulence data is being used w/o ADJ_U* option SigA Data

MX W479 24 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 29 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 30 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 31 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 48 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 51 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 52 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 53 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 141 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 143 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.877

MX W479 147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 151 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479	215	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	216	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.734
MX W479	221	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.535
MX W479	222	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	243	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.588
MX W479	244	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	291	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	296	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	308	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.572
MX W479	312	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	313	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.700
MX W479	314	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.735
MX W479	317	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.795
MX W479	318	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.549
MX W479	320	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	321	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.644
MX W479	340	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	342	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	344	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561
MX W479	475	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.580
MX W479	479	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	482	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.746
MX W479	483	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	484	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	486	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	487	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.681
MX W479	488	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.697
MX W479	489	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.921

MX W479	509	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.586
MX W479	524	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	526	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	527	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	528	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.926
MX W479	529	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.676
MX W479	530	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.808
MX W479	531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.740
MX W479	532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.537
MX W479	533	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.621
MX W479	534	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.830
MX W479	535	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.510
MX W479	550	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.611
MX W479	554	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.558
MX W479	555	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	556	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.743
MX W479	573	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.536
MX W479	574	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.241
MX W479	575	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	576	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.562
MX W479	577	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	578	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.213
MX W479	579	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.698
MX W479	580	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	581	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.713
MX W479	582	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.678
MX W479	583	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.869
MX W479	584	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.806

MX W479 595 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 597 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.667

MX W479 599 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.596

MX W479 600 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 601 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.705

MX W479 605 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.665

MX W479 632 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 725 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 727 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 775 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 822 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 837 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 838 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 839 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 932 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 1029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 1031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479 1034 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 1035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 1051 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 1052 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 1053 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.884

MX W479 1054 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.859

MX W479 1055 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.766

MX W479 1056 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.677

MX W479 1060 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 1061 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.639

MX W479 1197 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 1198 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.709

MX W479 1199 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.645

MX W479 1200 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.530

MX W479 1201 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.663

MX W479 1202 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.650

MX W479 1203 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.590

MX W479 1204 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.726

MX W479 1205 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.750

MX W479 1206 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.700

MX W479 1208 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 1218 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 1219 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.824

MX W479 1220 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 1221 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.731

MX W479 1222 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 1223 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 1224 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 1225 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 1226 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.753

MX W479 1227 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.778

MX W479 1228 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 1229 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 1230 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 1231 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.753

MX W479 1243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 1244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 1245 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 1276 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 1277 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 1278 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.729

MX W479 1293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 1294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.851

MX W479 1295 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 1296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 1297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 1300 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 1301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.723

MX W479 1302 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 1303 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 1316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.692

MX W479 1343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 1344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.720

MX W479 1345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 1346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 1347 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.663

MX W479 1348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 1363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 1365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.696

MX W479 1373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 1374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1375 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.622

MX W479 1392 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 1394 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.577

MX W479 1395 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 1396 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 1397 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 1441 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 1442 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1483 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 1532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 1537 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1539 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 1540 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 1541 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 1543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 1566 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 1661 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 1989 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 1990 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 1991 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.509

MX W479 1993 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.563

MX W479 1994 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.534

MX W479 2086 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 2088 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 2089 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 2093 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 2228 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.579

MX W479 2229 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 2230 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.693

MX W479 2231 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 2232 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.632

MX W479 2234 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 2235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 2253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 2254 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 2255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.755

MX W479 2262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 2348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 2349 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2350 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 2351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2352 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.834

MX W479 2353 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 2354 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2355 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.560

MX W479 2356 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 2373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.752

MX W479 2374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 2378 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 2379 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 2380 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 2382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 2399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.920

MX W479 2421 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2422 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 2424 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 2425 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 2428 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 2429 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 2430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 2445 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2447 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.779

MX W479 2448 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 2449 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.733

MX W479 2450 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 2468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.019

MX W479 2470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.976

MX W479 2471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.882

MX W479 2472 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.650

MX W479 2542 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.826

MX W479 2544 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 2545 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.629

MX W479 2546 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.769

MX W479 2547 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.656

MX W479 2548 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.679

MX W479 2549 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.853

MX W479 2550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2615 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 2616 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 2617 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2639 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 2640 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2641 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.777

MX W479 2643 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 2645 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 2646 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 2663 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.896

MX W479 2664 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 2666 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 2669 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 2670 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 2763 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.504

MX W479 2783 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.567

MX W479 2786 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.588

MX W479 2788 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2789 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2832 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 2833 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.506

MX W479 2900 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 2901 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.673

MX W479 2902 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.730

MX W479 2903 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 2905 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.672

MX W479 2906 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.753

MX W479 2907 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 3045 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 3047 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.554

MX W479 3048 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 3148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 3149 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 3168 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 3169 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 3170 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.601

MX W479 3171 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.796

MX W479 3172 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 3173 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.889

MX W479 3174 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 3239 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 3262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 3263 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 3289 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 3290 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 3291 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 3293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 3294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.672

MX W479 3313 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 3316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 3337 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 3338 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.521

MX W479 3339 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 3363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.584

MX W479 3364 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 3365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 3366 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 3382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 3383 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 3384 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.606

MX W479 3453 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 3454 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.711

MX W479 3457 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 3509 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.654

MX W479 3525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 3671 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.541

MX W479 3674 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 3693 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 3748 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.562

MX W479 3792 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.536

MX W479 3796 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 4029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.848

MX W479 4030 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.707

MX W479 4031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 4035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 4036 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.645

MX W479 4037 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 4057 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.502

MX W479 4080 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 4101 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.545

MX W479 4102 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 4103 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.847

MX W479 4104 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 4105 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 4172 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.682

MX W479 4173 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.824

MX W479 4227 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 4297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 4298 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.590

MX W479 4301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 4493 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 4586 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 4629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.548

MX W479 4630 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 4652 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 4653 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.685

MX W479 4654 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 4656 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 4657 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.903

MX W479 4658 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.975

MX W479 4659 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.826

MX W479 4660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.741

MX W479 4661 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.888

MX W479 4677 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.524

MX W479 4679 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 4680 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.591

MX W479 4685 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.731

MX W479 4724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 4996 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.544

MX W479 5331 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.662

MX W479 5332 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 5471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 5472 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 5475 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 5614 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.669

MX W479 5615 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 5621 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 5622 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.623

MX W479 5790 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 5804 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 5805 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 5809 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 5812 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.675

MX W479 5813 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.645

MX W479 5814 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.523

MX W479 5979 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 5980 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 6120 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 6121 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 6125 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 6126 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 6142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 6146 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 6147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.573

MX W479 6148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.779

MX W479 6149 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.883

MX W479 6150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.860

MX W479 6267 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 6268 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 6271 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 6286 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 6292 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.577

MX W479 6294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.615

MX W479 6405 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 6406 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.887

MX W479 6407 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 6408 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.541

MX W479 6409 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 6410 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.740

MX W479 6411 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 6413 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 6430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479	6431	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	6435	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.023
MX W479	6436	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	6486	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	6501	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.822
MX W479	6524	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.557
MX W479	6525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.600
MX W479	6526	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	6528	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.612
MX W479	6529	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	6530	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	6531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.662
MX W479	6532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.680
MX W479	6548	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.718
MX W479	6549	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.739
MX W479	6550	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.767
MX W479	6553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.592
MX W479	6554	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.776
MX W479	6555	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.581
MX W479	6556	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	6558	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.988
MX W479	6559	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.766
MX W479	6571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	6572	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.870
MX W479	6573	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.668
MX W479	6574	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.705
MX W479	6577	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.791
MX W479	6578	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	6579	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.622

MX W479 6580 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 6581 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.872

MX W479 6582 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.704

MX W479 6583 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 6596 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 6602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 6791 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.545

MX W479 6835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.564

MX W479 6836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 6868 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 6870 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 6890 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 6912 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 6913 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 6914 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.591

MX W479 6915 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 6917 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 6918 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 7014 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 7099 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.534

MX W479 7100 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.759

MX W479 7101 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7103 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 7111 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 7123 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 7126 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 7127 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 7129 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.509

MX W479 7130 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 7131 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 7132 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 7195 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.554

MX W479 7196 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 7199 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.566

MX W479 7207 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 7220 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 7243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.628

MX W479 7244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 7246 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 7252 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.629

MX W479 7253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 7255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.681

MX W479 7316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.757

MX W479 7317 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 7318 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.570

MX W479 7319 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 7321 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 7323 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 7324 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 7326 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 7340 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.691

MX W479 7343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 7345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.627

MX W479 7346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 7351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 7363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 7364 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.215

MX W479 7366 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 7367 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.612

MX W479 7368 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.799

MX W479 7369 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.518

MX W479 7388 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 7389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 7390 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 7391 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.797

MX W479 7393 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7395 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 7396 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 7397 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 7399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.656

MX W479 7400 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.686

MX W479 7446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.641

MX W479 7462 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.761

MX W479 7468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 7469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.811

MX W479 7470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.856

MX W479 7471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.803

MX W479 7484 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 7513 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 7514 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 7531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.594

MX W479 7543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 7585 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.532

MX W479 7586 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.831

MX W479 7587 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.573

MX W479 7602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 7603 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 7660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.708

MX W479 7661 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 7681 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 7682 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7683 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.707

MX W479 7684 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.628

MX W479 7753 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.641

MX W479 7755 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.502

MX W479 7794 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 7796 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.032

MX W479 7797 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.212

MX W479 7798 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.800

MX W479 7801 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.637

MX W479 7802 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.906

MX W479 7803 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 7804 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.841

MX W479 7805 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.048

MX W479 7806 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.021

MX W479 7807 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.755

MX W479 7819 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.902

MX W479 7867 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.583

MX W479 7869 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 7873 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 7878 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 7879 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 7891 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 7892 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.532

MX W479 7894 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.509

MX W479 7896 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479	7897	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.506
MX W479	7898	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.761
MX W479	7899	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.773
MX W479	7900	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	7901	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.852
MX W479	7941	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	7948	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7989	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.671
MX W479	7990	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	7991	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	7992	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.622
MX W479	7993	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.288
MX W479	7994	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.608
MX W479	7996	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.606
MX W479	8011	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	8041	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.505
MX W479	8042	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	8062	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	8067	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	8086	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.668
MX W479	8087	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.504
MX W479	8088	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.618
MX W479	8089	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	8090	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.585
MX W479	8091	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	8107	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.613
MX W479	8108	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	8111	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.564
MX W479	8112	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.633

MX W479 8116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 8117 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.838

MX W479 8118 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 8119 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.001

MX W479 8120 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.649

MX W479 8190 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 8191 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 8192 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 8202 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.572

MX W479 8203 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.563

MX W479 8204 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.511

MX W479 8206 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 8208 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.642

MX W479 8209 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.717

MX W479 8210 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.670

MX W479 8211 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 8213 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.701

MX W479 8214 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.584

MX W479 8215 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.714

MX W479 8216 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.687

MX W479 8229 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 8230 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 8231 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 8235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 8238 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 8301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.642

MX W479 8304 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 8306 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.685

MX W479 8307 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479	8311	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.550
MX W479	8350	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.596
MX W479	8356	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.511
MX W479	8358	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	8360	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	8427	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.593
MX W479	8428	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.548
MX W479	8442	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	8445	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	8447	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	8448	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	8450	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	8451	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.695
MX W479	8452	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.533
MX W479	8514	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	8553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.944
MX W479	8567	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.619
MX W479	8570	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.535
MX W479	8571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	8595	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626
MX W479	8646	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	8660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.567
MX W479	8730	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	8734	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	8735	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.560
MX W479	8760	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** MODEL SETUP OPTIONS SUMMARY ***

** Model Options Selected:

* Model Uses Regulatory DEFAULT Options
* Model Is Setup For Calculation of Average CONCentration Values.
* NO GAS DEPOSITION Data Provided.
* NO PARTICLE DEPOSITION Data Provided.
* Model Uses NO DRY DEPLETION. DDPLETE = F
* Model Uses NO WET DEPLETION. WETDPLT = F
* Stack-tip Downwash.
* Model Accounts for ELEVated Terrain Effects.
* Use Calms Processing Routine.
* Use Missing Data Processing Routine.
* No Exponential Decay.
* Model Uses RURAL Dispersion Only.
* BULKRN - Use BULKRN Delta-T and SolarRad option for SBL in AERMET
* Model Assumes No FLAGPOLE Receptor Heights.
* The User Specified a Pollutant Type of: HCL

**Model Calculates 1 Short Term Average(s) of: 1-HR
and Calculates ANNUAL Averages

**This Run Includes: 1 Source(s); 1 Source Group(s); and 3106 Receptor(s)

with: 1 POINT(s), including

0 POINTCAP(s) and 0 POINTHOR(s)

and: 0 VOLUME source(s)

and: 0 AREA type source(s)

and: 0 LINE source(s)

and: 0 RLINE/RLINEXT source(s)

and: 0 OPENPIT source(s)

and: 0 BUOYANT LINE source(s) with a total of 0 line(s)

and: 0 SWPOINT source(s)

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 22112

**Output Options Selected:

Model Outputs Tables of ANNUAL Averages by Receptor

Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours

m for Missing Hours

b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1730.68 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0

Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07

Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 3.9 MB of RAM.

**Input Runstream File: C:\Users\jonahl\Antea USA, Inc\Connell Resources Inc-Connell - General\Air Modeling\BEEST Model\

**Output Print File: C:\Users\jonahl\Antea USA, Inc\Connell Resources Inc-Connell - General\Air Modeling\BEEST Model\

**File for Summary of Results: C:\Users\jonahl\Antea USA, Inc\Connell Resources Inc-Connell - General\Air Modeling\BEEST Model\

*** AERMOD - VERSION 22112 *** *** Title One *** 04/20/23

*** AERMET - VERSION 22112 *** *** *** 22:45:15

PAGE 2

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***

(1=YES; 0=NO)

1 1 1

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***

(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** AERMOD - VERSION 22112 *** *** Title One *** 04/20/23

*** AERMET - VERSION 22112 *** *** *** 22:45:15

PAGE 3

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling Met Version: 22112

Profile file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling

Surface format: FREE

Profile format: FREE

Surface station no.: 0 Upper air station no.: 23062

Name: UNKNOWN Name: DENVER WSFO, CO

Year: 2006 Year: 2006

First 24 hours of scalar data

YR MO DY JDY HR H0 U* W* DT/DZ ZICNV ZIMCH M-O LEN Z0 BOWEN ALBEDO REF WS WD HT REF TA HT

- -

06 01 01 1 01 -26.0 0.162 -9.000 -9.000 -999. 157. 11.8 0.01 1.89 1.00 4.43 326. 10.0 280.1 2.0

06 01 01 1 02 -58.1 0.325 -9.000 -9.000 -999. 445. 42.5 0.01 1.89 1.00 6.57 310. 10.0 281.4
2.0

06 01 01 1 03 -33.0 0.292 -9.000 -9.000 -999. 380. 54.5 0.01 1.89 1.00 5.72 272. 10.0 281.0
2.0

06 01 01 1 04 -14.9 0.128 -9.000 -9.000 -999. 134. 10.2 0.01 1.89 1.00 3.67 320. 10.0 279.8
2.0

06 01 01 1 05 -13.5 0.124 -9.000 -9.000 -999. 105. 10.1 0.01 1.89 1.00 3.71 337. 10.0 279.0
2.0

06 01 01 1 06 -18.3 0.176 -9.000 -9.000 -999. 177. 21.3 0.01 1.89 1.00 4.29 344. 10.0 278.3
2.0

06 01 01 1 07 -34.9 0.286 -9.000 -9.000 -999. 367. 48.1 0.01 1.89 1.00 5.68 327. 10.0 279.3
2.0

06 01 01 1 08 -39.7 0.440 -9.000 -9.000 -999. 701. 154.4 0.01 1.89 1.00 7.96 307. 10.0 279.8
2.0

06 01 01 1 09 -17.3 0.580 -9.000 -9.000 -999. 1058. 810.0 0.01 1.89 0.43 10.10 287. 10.0 279.4
2.0

06 01 01 1 10 38.3 0.682 0.602 0.005 164. 1349. -597.0 0.01 1.89 0.31 11.67 301. 10.0 280.9
2.0

06 01 01 1 11 83.4 0.893 1.120 0.005 486. 2020. -616.6 0.01 1.89 0.26 15.29 291. 10.0 281.4
2.0

06 01 01 1 12 97.2 0.889 1.326 0.005 693. 2013. -521.8 0.01 1.89 0.24 15.20 293. 10.0 281.3
2.0

06 01 01 1 13 137.5 0.968 1.629 0.005 909. 2279. -476.9 0.01 1.89 0.24 16.54 291. 10.0
281.3 2.0

06 01 01 1 14 122.9 0.912 1.653 0.005 1063. 2100. -445.7 0.01 1.89 0.25 15.56 290. 10.0
281.0 2.0

06 01 01 1 15 67.7 0.795 1.385 0.005 1138. 1727. -536.6 0.01 1.89 0.30 13.59 295. 10.0
280.1 2.0

06 01 01 1 16 0.0 0.715 -9.000 -9.000 -999. 1464. 8888.0 0.01 1.89 0.41 12.34 301. 10.0 279.0
2.0

06 01 01 1 17 0.0 0.673 -9.000 -9.000 -999. 1330. 8888.0 0.01 1.89 0.72 11.62 304. 10.0 277.1
2.0

06 01 01 1 18 0.0 0.546 -9.000 -9.000 -999. 987. 8888.0 0.01 1.89 1.00 9.43 293. 10.0 275.9
2.0

06 01 01 1 19 -46.9 0.630 -9.000 -9.000 -999. 1199. 388.5 0.01 1.89 1.00 11.09 294. 10.0 276.2
2.0

06 01 01 1 20 -49.7 0.337 -9.000 -9.000 -999. 566. 55.9 0.01 1.89 1.00 6.57 310. 10.0 275.6
2.0

06 01 01 1 21 -29.5 0.194 -9.000 -9.000 -999. 235. 17.9 0.01 1.89 1.00 4.69 313. 10.0 274.4
2.0

06 01 01 1 22 -29.9 0.238 -9.000 -9.000 -999. 279. 32.8 0.01 1.89 1.00 5.32 338. 10.0 275.8
2.0

06 01 01 1 23 -15.8 0.134 -9.000 -9.000 -999. 123. 11.1 0.01 1.89 1.00 3.67 241. 10.0 274.5
2.0

06 01 01 1 24 -19.1 0.117 -9.000 -9.000 -999. 96. 6.1 0.01 1.89 1.00 3.98 279. 10.0 273.6
2.0

First hour of profile data

YR MO DY HR HEIGHT F WDIR WSPD AMB_TMP sigmaA sigmaW sigmaV

06 01 01 01 2.0 0 -999. -99.00 280.1 99.0 -99.00 -99.00

06 01 01 01 10.0 0 326. 4.43 282.0 5.4 -99.00 0.42

06 01 01 01 60.0 1 316. 5.10 283.1 6.1 -99.00 0.54

F indicates top of profile (=1) or below (=0)

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF HCL IN MICROGRAMS/M**3 **

NETWORK

GROUP ID AVERAGE CONC RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

ALL 1ST HIGHEST VALUE IS 0.02665 AT (499558.46, 4508185.11, 1604.36, 1607.87, 0.00) DC

2ND HIGHEST VALUE IS 0.02631 AT (499557.26, 4508175.42, 1604.20, 1607.87, 0.00) DC

3RD HIGHEST VALUE IS 0.02540 AT (499556.05, 4508165.74, 1604.06, 1607.87, 0.00) DC

4TH HIGHEST VALUE IS 0.02513 AT (499559.67, 4508194.79, 1604.62, 1607.87, 0.00) DC

5TH HIGHEST VALUE IS 0.02414 AT (499554.85, 4508156.06, 1603.92, 1603.92, 0.00) DC

6TH HIGHEST VALUE IS 0.02276 AT (499560.88, 4508204.47, 1604.89, 1610.23, 0.00) DC

7TH HIGHEST VALUE IS 0.02213 AT (499553.64, 4508146.37, 1603.79, 1603.79, 0.00) DC

8TH HIGHEST VALUE IS 0.02045 AT (499562.08, 4508214.16, 1605.18, 1611.24, 0.00) DC

9TH HIGHEST VALUE IS 0.01996 AT (499581.17, 4508184.30, 1606.77, 1607.87, 0.00) DC

10TH HIGHEST VALUE IS 0.01967 AT (499552.44, 4508136.69, 1603.68, 1603.68, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF HCL IN MICROGRAMS/M**3 **

DATE NETWORK

GROUP ID AVERAGE CONC (YYMMDDHH) RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

- -

ALL HIGH 1ST HIGH VALUE IS 0.68636 ON 06121903: AT (499556.05, 4508165.74, 1604.06, 1607.87, 0.00) DC

HIGH 2ND HIGH VALUE IS 0.64740 ON 06090703: AT (499556.05, 4508165.74, 1604.06, 1607.87, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** AERMOD - VERSION 22112 *** *** Title One *** 04/20/23

*** AERMET - VERSION 22112 *** *** *** 22:45:15

PAGE 6

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)

A Total of 624 Warning Message(s)

A Total of 142 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 1 Calm Hours Identified

A Total of 141 Missing Hours Identified (1.61 Percent)

******** FATAL ERROR MESSAGES ********

*** NONE ***

******** WARNING MESSAGES ********

ME W181 3169 MEOPEN: BULKRN Delta-T & SolarRad option for SBL was used in AERMET

MX W403 3169 PFLCNV: Turbulence data is being used w/o ADJ_U* option SigA Data

MX W479 24 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 29 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 30 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 31 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 48 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 51 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 52 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 53 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 141 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 143 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.877

MX W479 147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479	151	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.501
MX W479	215	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	216	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.734
MX W479	221	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.535
MX W479	222	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	243	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.588
MX W479	244	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	291	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	296	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	308	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.572
MX W479	312	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	313	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.700
MX W479	314	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.735
MX W479	317	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.795
MX W479	318	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.549
MX W479	320	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	321	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.644
MX W479	340	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	342	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	344	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561
MX W479	475	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.580
MX W479	479	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	482	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.746
MX W479	483	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	484	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	486	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	487	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.681
MX W479	488	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.697

MX W479	489	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.921
MX W479	509	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.586
MX W479	524	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	526	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	527	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	528	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.926
MX W479	529	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.676
MX W479	530	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.808
MX W479	531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.740
MX W479	532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.537
MX W479	533	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.621
MX W479	534	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.830
MX W479	535	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.510
MX W479	550	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.611
MX W479	554	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.558
MX W479	555	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	556	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.743
MX W479	573	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.536
MX W479	574	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.241
MX W479	575	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	576	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.562
MX W479	577	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	578	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.213
MX W479	579	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.698
MX W479	580	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	581	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.713
MX W479	582	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.678
MX W479	583	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.869

MX W479 584 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 595 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 597 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.667

MX W479 599 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.596

MX W479 600 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 601 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.705

MX W479 605 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.665

MX W479 632 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 725 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 727 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 775 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 822 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 837 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 838 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 839 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 932 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 1029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 1031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479 1034 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 1035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 1051 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 1052 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 1053 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.884

MX W479 1054 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.859

MX W479 1055 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.766

MX W479 1056 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.677

MX W479 1060 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 1061 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.639

MX W479 1197 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 1198 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.709

MX W479 1199 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.645

MX W479 1200 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.530

MX W479 1201 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.663

MX W479 1202 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.650

MX W479 1203 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.590

MX W479 1204 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.726

MX W479 1205 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.750

MX W479 1206 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.700

MX W479 1208 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 1218 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 1219 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.824

MX W479 1220 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 1221 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.731

MX W479 1222 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 1223 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 1224 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 1225 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 1226 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.753

MX W479 1227 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.778

MX W479 1228 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 1229 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 1230 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 1231 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.753

MX W479 1243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 1244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 1245 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 1276 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 1277 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 1278 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.729

MX W479 1293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 1294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.851

MX W479 1295 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 1296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 1297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 1300 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 1301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.723

MX W479 1302 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 1303 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 1316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.692

MX W479 1343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 1344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.720

MX W479 1345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 1346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 1347 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.663

MX W479 1348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 1363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 1365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.696

MX W479 1373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 1374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1375 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.622

MX W479 1392 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 1394 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.577

MX W479 1395 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 1396 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 1397 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 1441 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 1442 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1483 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 1532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 1537 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1539 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 1540 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 1541 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 1543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 1566 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 1661 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 1989 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 1990 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 1991 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.509

MX W479 1993 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.563

MX W479 1994 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.534

MX W479 2086 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 2088 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 2089 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 2093 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 2228 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.579

MX W479 2229 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 2230 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.693

MX W479 2231 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 2232 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.632

MX W479 2234 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 2235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 2253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 2254 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 2255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.755

MX W479 2262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 2348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 2349 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2350 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 2351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2352 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.834

MX W479 2353 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 2354 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2355 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.560

MX W479 2356 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 2373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.752

MX W479 2374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 2378 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 2379 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 2380 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 2382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 2399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.920

MX W479 2421 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2422 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 2424 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 2425 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 2428 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 2429 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 2430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 2445 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2447 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.779

MX W479 2448 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 2449 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.733

MX W479 2450 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 2468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.019

MX W479 2470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.976

MX W479 2471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.882

MX W479 2472 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.650

MX W479 2542 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.826

MX W479 2544 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 2545 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.629

MX W479 2546 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.769

MX W479 2547 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.656

MX W479 2548 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.679

MX W479 2549 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.853

MX W479 2550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2615 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 2616 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 2617 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2639 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 2640 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2641 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.777

MX W479 2643 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 2645 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 2646 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 2663 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.896

MX W479 2664 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 2666 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 2669 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 2670 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 2763 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.504

MX W479 2783 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.567

MX W479 2786 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.588

MX W479 2788 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2789 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2832 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 2833 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.506

MX W479 2900 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 2901 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.673

MX W479 2902 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.730

MX W479 2903 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 2905 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.672

MX W479 2906 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.753

MX W479 2907 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 3045 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 3047 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.554

MX W479 3048 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 3148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 3149 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 3168 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 3169 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 3170 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.601

MX W479 3171 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.796

MX W479 3172 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 3173 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.889

MX W479 3174 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 3239 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 3262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 3263 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 3289 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 3290 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 3291 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 3293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 3294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.672

MX W479 3313 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 3316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 3337 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 3338 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.521

MX W479 3339 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 3363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.584

MX W479 3364 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 3365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 3366 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 3382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 3383 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 3384 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.606

MX W479 3453 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 3454 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.711

MX W479 3457 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 3509 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.654

MX W479 3525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 3671 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.541

MX W479 3674 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 3693 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 3748 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.562

MX W479 3792 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.536

MX W479 3796 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 4029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.848

MX W479 4030 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.707

MX W479 4031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 4035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 4036 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.645

MX W479 4037 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 4057 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.502

MX W479 4080 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 4101 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.545

MX W479 4102 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 4103 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.847

MX W479 4104 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 4105 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 4172 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.682

MX W479 4173 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.824

MX W479 4227 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 4297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 4298 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.590

MX W479 4301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 4493 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 4586 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 4629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.548

MX W479 4630 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 4652 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 4653 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.685

MX W479 4654 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 4656 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 4657 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.903

MX W479 4658 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.975

MX W479 4659 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.826

MX W479 4660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.741

MX W479 4661 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.888

MX W479 4677 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.524

MX W479 4679 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 4680 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.591

MX W479 4685 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.731

MX W479 4724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 4996 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.544

MX W479 5331 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.662

MX W479 5332 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 5471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 5472 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 5475 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 5614 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.669

MX W479 5615 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 5621 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 5622 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.623

MX W479 5790 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 5804 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 5805 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 5809 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 5812 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.675

MX W479 5813 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.645

MX W479 5814 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.523

MX W479 5979 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 5980 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 6120 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 6121 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 6125 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 6126 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 6142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 6146 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 6147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.573

MX W479 6148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.779

MX W479 6149 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.883

MX W479 6150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.860

MX W479 6267 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 6268 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 6271 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 6286 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 6292 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.577

MX W479 6294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.615

MX W479 6405 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 6406 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.887

MX W479 6407 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 6408 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.541

MX W479 6409 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 6410 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.740

MX W479 6411 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 6413 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 6430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479 6431 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.841

MX W479 6435 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.023

MX W479 6436 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.778

MX W479 6486 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 6501 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.822

MX W479 6524 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 6525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.600

MX W479 6526 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.566

MX W479 6528 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.612

MX W479 6529 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.627

MX W479 6530 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 6531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.662

MX W479 6532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.680

MX W479 6548 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.718

MX W479 6549 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.739

MX W479 6550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.767

MX W479 6553 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 6554 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.776

MX W479 6555 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 6556 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 6558 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.988

MX W479 6559 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.766

MX W479 6571 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.523

MX W479 6572 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.870

MX W479 6573 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.668

MX W479 6574 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.705

MX W479 6577 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.791

MX W479 6578 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 6579 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.622

MX W479 6580 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 6581 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.872

MX W479 6582 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.704

MX W479 6583 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 6596 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 6602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 6791 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.545

MX W479 6835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.564

MX W479 6836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 6868 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 6870 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 6890 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 6912 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 6913 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 6914 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.591

MX W479 6915 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 6917 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 6918 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 7014 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 7099 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.534

MX W479 7100 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.759

MX W479 7101 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7103 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 7111 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 7123 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 7126 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 7127 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 7129 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.509

MX W479 7130 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 7131 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 7132 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 7195 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.554

MX W479 7196 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 7199 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.566

MX W479 7207 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 7220 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 7243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.628

MX W479 7244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 7246 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 7252 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.629

MX W479 7253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 7255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.681

MX W479 7316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.757

MX W479 7317 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 7318 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.570

MX W479 7319 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 7321 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 7323 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 7324 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 7326 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 7340 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.691

MX W479 7343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 7345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.627

MX W479 7346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 7351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 7363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 7364 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.215

MX W479 7366 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 7367 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.612

MX W479 7368 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.799

MX W479 7369 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.518

MX W479 7388 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 7389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 7390 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 7391 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.797

MX W479 7393 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7395 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 7396 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 7397 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 7399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.656

MX W479 7400 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.686

MX W479 7446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.641

MX W479 7462 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.761

MX W479 7468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 7469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.811

MX W479 7470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.856

MX W479 7471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.803

MX W479 7484 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 7513 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 7514 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 7531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.594

MX W479 7543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 7585 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.532

MX W479 7586 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.831

MX W479 7587 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.573

MX W479 7602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 7603 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 7660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.708

MX W479 7661 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 7681 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 7682 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7683 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.707

MX W479 7684 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.628

MX W479 7753 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.641

MX W479 7755 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.502

MX W479 7794 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 7796 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.032

MX W479 7797 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.212

MX W479 7798 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.800

MX W479 7801 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.637

MX W479 7802 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.906

MX W479 7803 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 7804 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.841

MX W479 7805 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.048

MX W479 7806 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.021

MX W479 7807 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.755

MX W479 7819 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.902

MX W479 7867 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.583

MX W479 7869 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 7873 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 7878 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 7879 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 7891 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 7892 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.532

MX W479 7894 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.509

MX W479 7896 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 7897 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.506

MX W479 7898 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.761

MX W479 7899 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.773

MX W479 7900 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 7901 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.852

MX W479 7941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 7948 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 7989 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 7990 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 7991 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.627

MX W479 7992 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.622

MX W479 7993 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.288

MX W479 7994 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 7996 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.606

MX W479 8011 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 8041 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 8042 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 8062 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 8067 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 8086 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 8087 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.504

MX W479 8088 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.618

MX W479 8089 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 8090 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 8091 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.523

MX W479 8107 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 8108 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 8111 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.564

MX W479 8112 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 8116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 8117 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.838

MX W479 8118 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 8119 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.001

MX W479 8120 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.649

MX W479 8190 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 8191 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 8192 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 8202 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.572

MX W479 8203 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.563

MX W479 8204 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.511

MX W479 8206 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 8208 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.642

MX W479 8209 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.717

MX W479 8210 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.670

MX W479 8211 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 8213 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.701

MX W479 8214 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.584

MX W479 8215 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.714

MX W479 8216 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.687

MX W479 8229 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 8230 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 8231 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 8235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

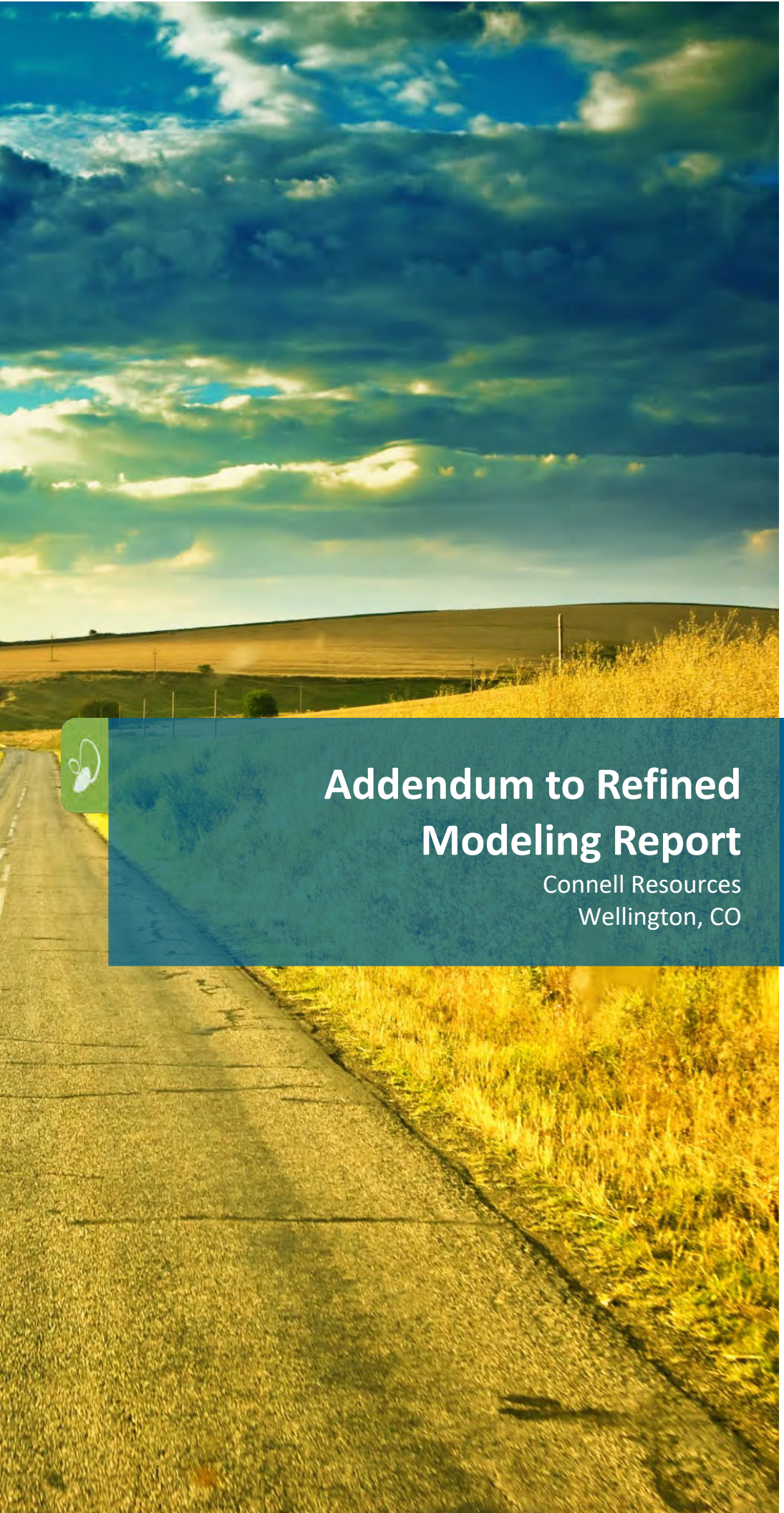
MX W479 8238 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 8301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.642

MX W479 8304 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 8306 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.685

MX W479	8307	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	8311	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.550
MX W479	8350	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.596
MX W479	8356	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.511
MX W479	8358	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	8360	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	8427	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.593
MX W479	8428	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.548
MX W479	8442	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	8445	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	8447	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	8448	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	8450	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	8451	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.695
MX W479	8452	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.533
MX W479	8514	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	8553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.944
MX W479	8567	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.619
MX W479	8570	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.535
MX W479	8571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	8595	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626
MX W479	8646	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	8660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.567
MX W479	8730	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	8734	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	8735	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.560
MX W479	8760	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626



Addendum to Refined Modeling Report

Connell Resources
Wellington, CO

Antea®Group

Understanding today.
Improving tomorrow.

PREPARED FOR
Connell Resources
7785 Highland Meadows Parkway
#100
Fort Collins, CO 80528

PREPARED BY
Antea Group Charlotte, NC

May 26, 2023

Project # 2023-01-504091

us.anteagroup.com

The logo and ANTEA are registration trademarks of Antea USA, Inc.

Contents

1.0 Introduction 1
1.1 Executive Summary 1
2.0 AerMod Results 1
3.0 Remarks 2

Tables

Table 1 - Emission Source Information
Table 2 - Building Information
Table 3 - Summary of AerMod Calculated Emission Concentrations
Table 4 - Summary of AerMod Calculated Emissions and NAAQS
Table 5 - Summary of Screening Analysis for AerMod Calculated HAP Emissions
Table 6 - AerMod Calculated HAP Emissions and Discrete Receptors - Acute Values
Table 7 - AerMod Calculated HAP Emissions and Discrete Receptors - Chronic Values

Figures

Figure 10A - Hexane Map (Long-Term) Potential
Figure 10B - Hexane Map (Short-Term) Potential
Figure 10C - Hexane Map (Long-Term) Permit
Figure 10D - Hexane Map (Short-Term) Permit
Figure 11A - Formaldehyde Map (Long-Term) Potential
Figure 11B - Formaldehyde Map (Short-Term) Potential
Figure 11C - Formaldehyde Map (Long-Term) Permit
Figure 11D - Formaldehyde Map (Short-Term) Permit
Figure 12A - Toluene Map (Long-Term)
Figure 12B - Toluene Map (Short-Term)
Figure 13A - Quinone Map (Long-Term)
Figure 18B - HCl Map (Short-Term)

Appendices

Appendix A - Emission Calculations and Supporting Documentation
Appendix B - AerMod Model Output

Refined Modeling Report

Wellington, Colorado

1.0 INTRODUCTION

1.1 EXECUTIVE SUMMARY

Antea®Group was retained to complete refined air modeling for Connell Resources to assist with their planned construction of a new asphalt facility in Wellington, Colorado. Antea Group completed AERMOD modeling based on information provided by Connell Resources for their proposed facility. Antea Group modeled the following pollutants as requested by Connell Resources: Particulate Matter, Nitrogen Oxide, Sulfur Dioxide, Carbon Monoxide, Acetaldehyde, Hexane, Formaldehyde, Toluene, Quinone, Benzene, Ethylbenzene, Xylene, Total PAH, and Hydrochloric Acid. Due to requests by Larimer County, Antea Group has prepared this addendum to the refined modeling report to address the following comments:

- Model was run under conditions in the refined modeling report. Changes were made to the Hexane, Formaldehyde and Toluene emission rates. Hexane and Formaldehyde were updated to include the permit limit emission rates. Toluene was updated to correct emission rate;
- **Table 1**: added permit limit equivalent emission rate for Hexane and Formaldehyde, see footnotes 1 through 4;
- **Table 1**: corrected Toluene emission rate;
- Created **Table 3** to summarize annual and 1-hour averaged AerMod calculated maximum emission concentration per CDPHE recommendation;
- Updated applicable table numbers with **Table 3** creation;
- **Table 5**: added permit limit equivalent calculated emission concentrations for Hexane and Formaldehyde, see footnotes 6 through 9;
- **Table 6** and **Table 7**: added permit limit equivalent calculated emission concentrations for Hexane and Formaldehyde, see footnotes 4 through 7;
- **Table 5** and **Table 7**: added Chronic Screening Value for Pollutant Quinone provided by Larimer County;
- **Table 5** and **Table 6**: added Acute Screening Value for Pollutant HCl provided by Larimer County;
- **Figure 10A through 12B**: updated concentration contours;
- **Figure 13A and 18B**: updated screening concentration per Larimer County recommendation; and
- **Appendix B**: updated applicable AerMod Model Outputs.

2.0 AERMOD RESULTS

The AERMOD modeling run demonstrated that the Screening Levels would not be exceeded for chronic long-term and acute short-term. A summary of all AerMod calculated emission concentrations over different averaging periods is presented on **Table 3**. A summary of modeled emissions and NAAQS is presented in **Table 4**. A summary of screening modeled emissions and chronic/acute screening values is presented in **Table 5**. Discrete receptor HAP concentrations for acute and chronic screening values are presented in **Table 6** and **Table 7**, respectively. Pollutant concentration contour maps are provided for general NAAQS pollutant time durations, and HAP Long-Term and Short-Term averaging exposure periods. Concentration contours were drawn at the receptor elevations provided through the Terrain map processing. The contour maps are present in **Figures 4 through Figure 18** in the Refined Modeling Report and the Addendum to the Refined Modeling Report.

3.0 REMARKS

The recommendations contained in this report represent Antea USA, Inc.'s professional opinions based upon the currently available information and are arrived at in accordance with currently accepted professional standards. This report is based upon a specific scope of work requested by the client. The contract between Antea USA, Inc. and its client outlines the scope of work, and only those tasks specifically authorized by that contract or outlined in this report were performed. This report is intended only for the use of Antea USA, Inc.'s client and anyone else specifically identified in writing by Antea USA, Inc. as a user of this report. Antea USA, Inc. will not and cannot be liable for unauthorized reliance by any other third party. Other than as contained in this paragraph, Antea USA, Inc. makes no express or implied warranty as to the contents of this report.

Kara J. Van Blarcum
Senior Professional

May 26, 2023

Reviewed by:

Tony Rossano
Senior Project Manager

May 26, 2023

Tables

Table 1 - Emission Source Information
Table 2 - Building Information
Table 3 - Summary of AerMod Calculated Emission Concentrations
Table 4 - Summary of AerMod Calculated Emissions and NAAQS
Table 5 - Summary of Screening Analysis for AerMod Calculated HAP Emissions
Table 6 - AerMod Calculated HAP Emissions and Discrete Receptors - Acute Values
Table 7 - AerMod Calculated HAP Emissions and Discrete Receptors - Chronic Values

Connell Resources
Wellington, CO
Table 1: Emission Source Information

Emission Point ID	Description	Location	Elevation (ft)	Height (ft)	Termination Orientation	Temperature (F)	Equivalent Exit Diameter (ft)	Flow Rate (cfm)	Easting (m)	Northing (m)
AIRS_ID_001	Main Emission Point	Wellington	5258	45	Vertical	218.93	6.00	85,000	499457.266	4508236.216

Pollutant	Emission Rate (ton/yr)
PM	2.7
PM10	0.7
PM2_5	0.2
NOX	8.3
SO2	8.7
CO	19.5
Acetaldehyde	0.195
Hexane[1]	0.138
Hexane[2]	0.143
Formaldehyde[3]	0.103
Formaldehyde[4]	0.465
Toluene	0.435
Quinone	0.0405
Benzene	0.042
Ethylbenzene	0.33
Xylene	0.405
Total_PAH	0.0345
HCl	0.0315
VOC	4.8

Notes
1 = Hexane potential emission rate based on AP-42, Table 11.1-10 (p. 11.1-21) provided Hexane emission factor and plant production limit
2 = Hexane emission rate provided by permit limit
3 = Formaldehyde potential emission rate based on Michigan Department of Environmental Quality provided Formaldehyde emission factor and plant production limit
4 = Formaldehyde emission rate provided by permit limit

Connell Resources
Wellington, CO
Table 2: Building Information

Building ID	Elevation (ft)	Tier Height (ft)	Easting (m)	Northing (m)
Asphalt	5258	14	499428.373	4508275.569
PCR_1	5259	16	499440.772	4508287.410
PCR_2	5260	12	499458.147	4508287.922
ABP_3	5257	20.5	499428.192	4508254.557
ABP_5	5258	26.4	499448.104	4508243.280
Office	5255	14	499260.168	4508275.882
TW_1	5254	10	499235.319	4508220.844
TW_2	5253	10	499230.147	4508184.114
FP	5254	10	499247.353	4508221.502
FS	5254	10	499262.192	4508221.708
WS	5250	10	499230.641	4508027.037
WG	5250	10	499253.366	4508027.502
ALB	5255	17.7	499378.442	4508201.725
Storshed	5258	10	499411.400	4508290.734
QCLab	5258	14	499423.707	4508282.246
WT1	5257	9.8	499397.849	4508256.301
WT2	5256	9.8	499386.231	4508253.964
D1	5254	9	499259.783	4508194.664
D2	5254	9	499269.843	4508203.302
D3	5254	9	499281.862	4508203.510
D4	5260	8.5	499480.488	4508282.821
Gas_AST	5254	9	499294.275	4508204.457
GEN	5260	9.5	499467.318	4508284.895
ACT	5258	10.2	499459.383	4508244.054

Vertical Storage Tanks

Tank Name	Elevation (ft)	Easting (m)	Northing (m)	Height (ft)	Diameter (ft)
T1	5258	499422.699	4508265.557	44.4	12
T2	5258	499434.251	4508265.622	44.4	12
T3	5259	499446.062	4508265.365	44.4	12

Connell Resources
Wellington, CO
Table 3: Summary of AerMod Calculated Emission Concentrations

Pollutant	Annual Averaged AerMod Calculated Maximum Emission Concentration ($\mu g/m^3$)
PM	0.034
PM-2.5	0.0025
NOx	0.10
VOC	0.060
Acetaldehyde	0.0024
Hexane[1]	0.0017
Hexane[2]	0.0018
Formaldehyde[3]	0.0013
Formaldehyde[4]	0.0058
Toluene	0.0054
Quinone	0.00051
Benzene	0.00052
Ethylbenzene	0.0041
Xylene	0.0051
Total PAH	0.00043
HCl	0.00039

Pollutant	1-Hour Averaged AerMod Calculated Maximum Emission Concentration ($\mu g/m^3$)
PM	2.3
NOX	7.1
SO_2	7.5
VOC	4.1
CO	17
Acetaldehyde	0.17
Hexane[1]	0.12
Hexane[2]	0.12
Formaldehyde[3]	0.088
Formaldehyde[4]	0.40
Toluene	0.37
Quinone	0.035
Benzene	0.036
Ethylbenzene	0.28
Xylene	0.35
Total PAH	0.030
HCl	0.027

Pollutant	Averaging Period	Averaged AerMod Calculated Maximum Emission Concentration ($\mu g/m^3$)
PM-10	24-hour	0.15
PM-2.5	24-hour	0.042
CO	8-hour	10

Notes
$\mu g/m^3$ = micrograms per cubic meter
1 = Hexane value from potential emission rate based on AP-42, Table 11.1-10 (p. 11.1-21) provided Hexane emission factor and plant production limit
2 = Hexane value from emission rate provided by permit limit
3 = Formaldehyde value from potential emission rate based on Michigan Department of Environmental Quality provided Formaldehyde emission factor and plant production limit
4 = Formaldehyde emission rate provided by permit limit

Connell Resources
Wellington, CO
Table 4: Summary of AerMod Calculated Emissions and NAAQS

Pollutant	Averaging Period	AerMod Concentration for Wellington Location ($\mu g/m^3$)	NAAQS Primary Concentration[1] ($\mu g/m^3$)	AerMod Wellington Percent of NAAQS
PM-10	24-hour	0.15	150	0.1%
PM-2.5	24-hour	0.042	35	0.1%
	1-year	0.0025	12	0.02%
NOx	1-hour	7.1	188 ab	4%
	1-year	0.10	100 ab	0.1%
SO2	1-hour	7.5	196 a	4%
CO	1-hour	17	40,000 a	0.0%
	8-hour	10	10,000 a	0.1%

Notes
$\mu g/m^3$ = micrograms per cubic meter
1 = National Ambient Air Quality Standards (NAAQS) for public health protection, including the health of sensitive populations
a = Conversion of units from ppm provided by NAAQS to $\mu g/m^3$ provided by California Air Resource Board
b = Standard provided for NO_2

Connell Resources
Wellington, CO
Table 5: Summary of Screening Analysis for AerMod Calculated HAP Emissions

Pollutant (CAS Number)	Emission Rate (ton/yr)	AerMod Long-Term[1] Average Concentration; ($\mu g/m^3$)	AerMod Short-Term[2] Average Concentration; ($\mu g/m^3$)	Chronic Screening Value[3] ($\mu g/m^3$)	Acute Screening Value[4] ($\mu g/m^3$)	AerMod Long-Term Percent of Acute NAAQS[5] (%)	AerMod Short-Term Percent of Acute NAAQS[5] (%)	Maximum Concentration is Greater than Chronic Screening Value (Yes/No)	Maximum Concentration is Greater than Acute Screening Value (Yes/No)
Acetaldehyde (75-07-0)	0.195	0.0024	0.17	0.45	470 a	5.4E-01	3.6E-02	No	No
Hexane[6] (110-54-3)	0.138	0.0017	0.12	70	390,000 b	2.5E-03	3.0E-05	No	No
Hexane[7] (110-54-3)	0.143	0.0018	0.12	70	390,000 b	2.5E-03	3.1E-05	No	No
Formaldehyde[8] (50-00-0)	0.103	0.0013	0.088	0.077	55 a	1.7E+00	1.6E-01	No	No
Formaldehyde[9] (50-00-0)	0.465	0.0058	0.3995	0.077	55 a	7.5E+00	7.3E-01	No	No
Toluene (108-88-3)	0.435	0.0054	0.37	40	37,000 a	1.4E-02	1.0E-03	No	No
Quinone (106-51-4)	0.0405	0.00051	0.035	0.4 c	10,000 b	1.3E-01	3.5E-04	No	No
Benzene (71-43-2)	0.0420	0.00052	0.036	0.13	1,300 a	4.0E-01	2.8E-03	No	No
Ethylbenzene (100-41-4)	0.330	0.0041	0.28	0.40	140,000 d	1.0E+00	2.0E-04	No	No
Xylene (1330-20-7)	0.405	0.0051	0.35	10	8,700 e	5.1E-02	4.0E-03	No	No
Total PAH[10]	0.0345	0.00043	0.030	0.11 f	0.75 g	3.9E-01	4.0E+00	No	No
HCl (7647-01-0)	0.0315	0.00039	0.027	2	190 h	2.0E-02	1.4E-02	No	No

Notes
ton/yr = ton per year
$\mu g/m^3$ = micrograms per cubic meter
-- = No value provided
1 = Averaging period of 1-year
2 = Averaging period of 1-hour
3 = Chronic screening values provided by EPA's Appendix A of the Preliminary Risk-Based Screening Approach for Air Toxics Moniotring Data Sets
4 = Acute screening values provided by EPA's Appendix B of the Preliminary Risk-Based Screening Approach for Air Toxics Moniotring Data Sets
5 = Percent calculated as (AerMod Concentration) / (NAAQS Screening Value) * 100
6 = Hexane value from potential emission rate based on AP-42, Table 11.1-10 (p. 11.1-21) provided Hexane emission factor and plant production limit
7 = Hexane value from emission rate provided by permit limit
8 = Formaldehyde value from potential emission rate based on Michigan Department of Environmental Quality provided Formaldehyde emission factor and plant production limit
9 = Formaldehyde emission rate provided by permit limit
10 = All relavent PAHs accounted for to calculate emission rate
a = Reference Exposure Level (REL) screening value developed by CalEPA
b = Immediately Dangerous to Life or Health divided by 10 (IDLH/10) screening value developed by NIOSH
c = Texas Commission of Environmental Quality Effects Screening Levels and NIOSH
d = Acute Exposure Guideline Levels (AEGL) screening value developed by NAC
e = Minimum Risk Levels (MRL) screening value developed by ATSDR
f = Average screening value for all PAHs provided in EPA's Appendix A of the Preliminary Risk-Based Screening Approach for Air Toxics Moniotring Data Sets
g = Temporary Emergency Exposure Limits with no effects (TEEL-0) screening value provided by DOE for the PAH Carbazole. The Carbazole screening value is used, because the average PAH chronic screening value most closely matched the chronic Carbazole screening value.
h = Texas Commission of Environmental Quality Effects Screening Levels

Connell Resources
Wellington, CO
Table 6: AerMod Calculated HAP Emissions and Discrete Receptors - Acute Values

Pollutant (CAS No.)	Emission Rate (ton/yr)	Acute Screening Value (µg/m^3)	Calculated 1-Hour Average HAP Exposure (µg/m3)					
			Receptor 1: Residential[1]	Receptor 1 Above Screening Value (Yes/No)	Receptor 2: Park[2]	Receptor 2 Above Screening Value (Yes/No)	Receptor 3: School[3]	Receptor 3 Above Screening Value (Yes/No)
Acetaldehyde (75-07-0)	0.195	470 a	0.17	No	0.241	No	0.030	No
Hexane[4] (110-54-3)	0.138	390,000 b	0.12	No	0.017	No	0.021	No
Hexane[5] (110-54-3)	0.143	390,000 b	0.12	No	0.018	No	0.022	No
Formaldehyde[6] (50-00-0)	0.103	55 a	0.09	No	0.013	No	0.016	No
Formaldehyde[7] (50-00-0)	0.465	55 a	0.40	No	0.057	No	0.072	No
Toluene (108-88-3)	0.435	37,000 a	0.37	No	0.054	No	0.068	No
Quinone (106-51-4)	0.0405	10,000 b	0.035	No	0.0050	No	0.0063	No
Benzene (71-43-2)	0.0420	1,300 a	0.036	No	0.0052	No	0.0065	No
Ethylbenzene (100-41-4)	0.330	140,000 c	0.28	No	0.041	No	0.051	No
Xylene (1330-20-7)	0.405	8,700 d	0.35	No	0.050	No	0.063	No
Total PAH	0.0345	0.75 e	0.030	No	0.0043	No	0.0054	No
HCl (7647-01-0)	0.0315	190 f	0.027	No	0.0039	No	0.0049	No

Notes
ton/yr = ton per year
µg/m^3 = micrograms per cubic meter
-- = No value provided
1 = Address is 9581 Brome Ct, Wellington, CO 80549
2 = Address is 8760 Buffalo Creek Pky Wellington, CO 80549
3 = Address is 4000 Wilson Avenue Wellington, CO 80549
4 = Hexane value from potential emission rate based on AP-42, Table 11.1-10 (p. 11.1-21) provided Hexane emission factor and plant production limit
5 = Hexane value from emission rate provided by permit limit
6 = Formaldehyde value from potential emission rate based on Michigan Department of Environmental Quality provided Formaldehyde emission factor and plant production limit
7 = Formaldehyde emission rate provided by permit limit
a = Reference Exposure Level (REL) screening value developed by CalEPA
b = Immediately Dangerous to Life or Health (IDLH) divided by 10 screening value developed by NIOSH
c = Acute Exposure Guideline Levels (AEGL) screening value developed by NAC
d = Minimum Risk Levels (MRL) screening value developed by ATSDR
e = Temporary Emergency Exposure Limits with no effects (TEEL-0) screening value provided by DOE for the PAH Carbazole. The Carbazole screening value is used, because the average PAH chronic screening value most closely matched the chronic Carbazole screening value.
f = Texas Commission of Environmental Quality Effects Screening Levels

Connell Resources
Wellington, CO
Table 7: AerMod Calculated HAP Emissions and Discrete Receptors - Chronic Values

Pollutant (CAS No.)	Emission Rate (ton/yr)	Chronic Screening Value ($\mu g/m^3$)	Calculated Annual Average HAP Exposure (µg/m3)					
			Receptor 1: Residential[1]	Receptor 1 Above Screening Value (Yes/No)	Receptor 2: Park[2]	Receptor 2 Above Screening Value (Yes/No)	Receptor 3: School[3]	Receptor 3 Above Screening Value (Yes/No)
Acetaldehyde (75-07-0)	0.195	0.45	0.0024	No	0.00026	No	0.00022	No
Hexane[4] (110-54-3)	0.138	70	0.0017	No	0.00019	No	0.00016	No
Hexane[5] (110-54-3)	0.143	70	0.0017	No	0.00021	No	0.00016	No
Formaldehyde[6] (50-00-0)	0.103	0.077	0.0013	No	0.00014	No	0.00012	No
Formaldehyde[7] (50-00-0)	0.465	0.077	0.0056	No	0.00069	No	0.00053	No
Toluene (108-88-3)	0.435	40	0.0053	No	0.00064	No	0.00050	No
Quinone (106-51-4)	0.0405	0.4 a	0.00049	No	0.000050	No	0.000050	No
Benzene (71-43-2)	0.0420	0.13	0.00051	No	0.000060	No	0.000050	No
Ethylbenzene (100-41-4)	0.330	0.40	0.0040	No	0.00044	No	0.00038	No
Xylene (1330-20-7)	0.405	10	0.0049	No	0.00054	No	0.00047	No
Total PAH	0.0345	0.11 b	0.00042	No	0.000050	No	0.000040	No
HCl (7647-01-0)	0.0315	2	0.00038	No	0.000040	No	0.000040	No

Notes
ton/yr = ton per year
$\mu g/m^3$ = micrograms per cubic meter
-- = No value provided
1 = Address is 9581 Brome Ct, Wellington, CO 80549
2 = Address is 8760 Buffalo Creek Pky Wellington, CO 80549
3 = Address is 4000 Wilson Avenue Wellington, CO 80549
4 = Hexane value from potential emission rate based on AP-42, Table 11.1-10 (p. 11.1-21) provided Hexane emission factor and plant production limit
5 = Hexane value from emission rate provided by permit limit
6 = Formaldehyde value from potential emission rate based on Michigan Department of Environmental Quality provided Formaldehyde emission factor and plant production limit
7 = Formaldehyde emission rate provided by permit limit
a = Texas Commission of Environmental Quality Effects Screening Levels and NIOSH
b = Average screening value for all PAHs provided in EPA's Appendix A of the Preliminary Risk-Based Screening Approach for Air Toxics Moniotring Data Sets

Figures

Figure 10A - Hexane Map (Long-Term) Potential
Figure 10B - Hexane Map (Short-Term) Potential
Figure 10C - Hexane Map (Long-Term) Permit
Figure 10D - Hexane Map (Short-Term) Permit
Figure 11A - Formaldehyde Map (Long-Term) Potential
Figure 11B - Formaldehyde Map (Short-Term) Potential
Figure 11C - Formaldehyde Map (Long-Term) Permit
Figure 11D - Formaldehyde Map (Short-Term) Permit
Figure 12A - Toluene Map (Long-Term)
Figure 12B - Toluene Map (Short-Term)
Figure 13A - Quinone Map (Long-Term)
Figure 18B - HCl Map (Short-Term)

FIGURE 10A - HEXANE MAP (LONG-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
SCREENING CONC. = 70
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

antea group
11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

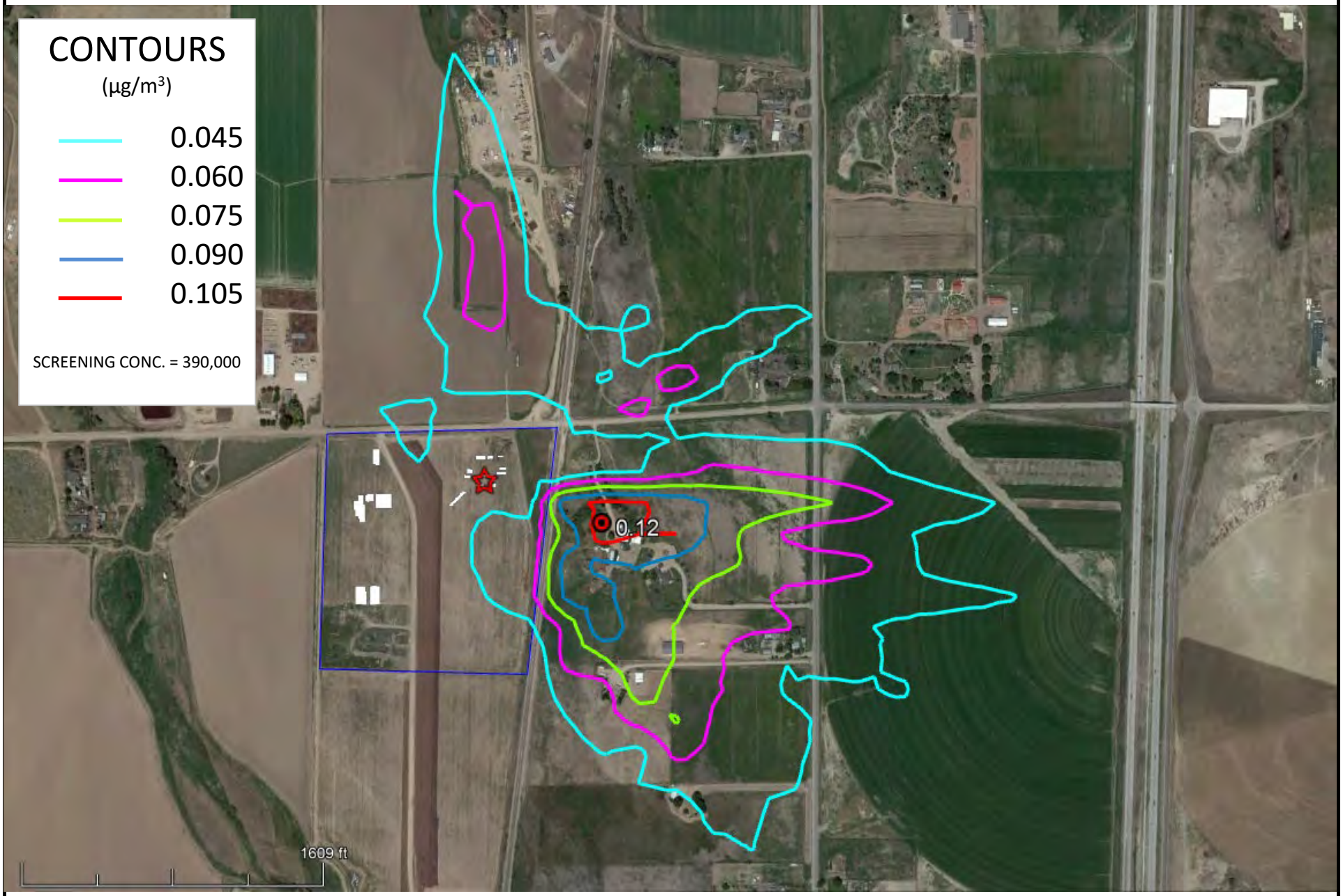


FIGURE 10B - HEXANE MAP (SHORT-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
SCREENING CONC. = 390,000
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

antea group
11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

FIGURE 10C - HEXANE MAP (LONG-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
SCREENING CONC. = 70
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/26/2023
SCALE: See Above
DRAWN BY: JL

antea group
11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

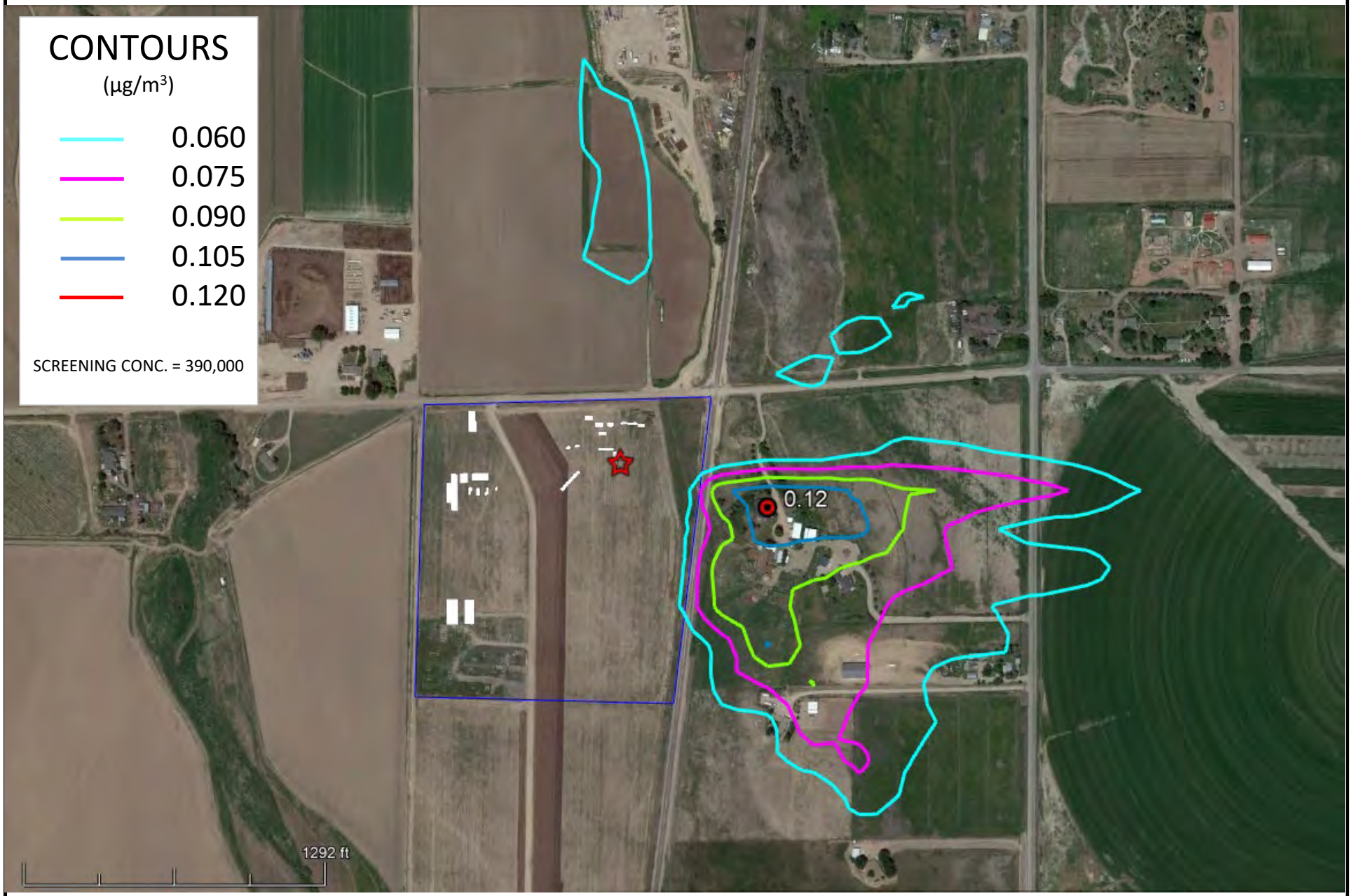


FIGURE 10D - HEXANE MAP (SHORT-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
SCREENING CONC. = 390,000
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/26/2023
SCALE: See Above
DRAWN BY: JL

antea group
11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

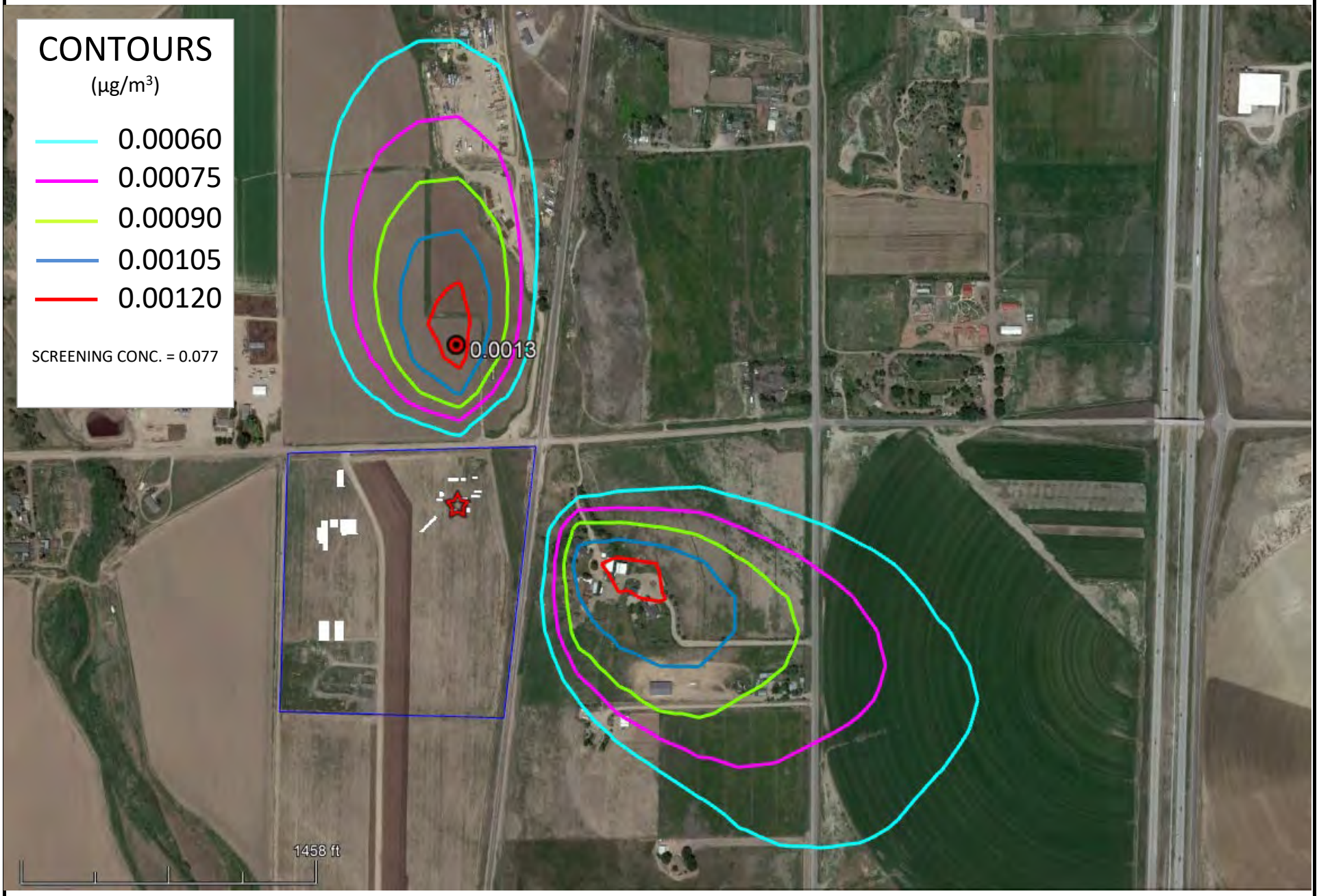


FIGURE 11A - FORMALDEHYDE MAP (LONG-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
SCREENING CONC. = 0.077
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

antea group
11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

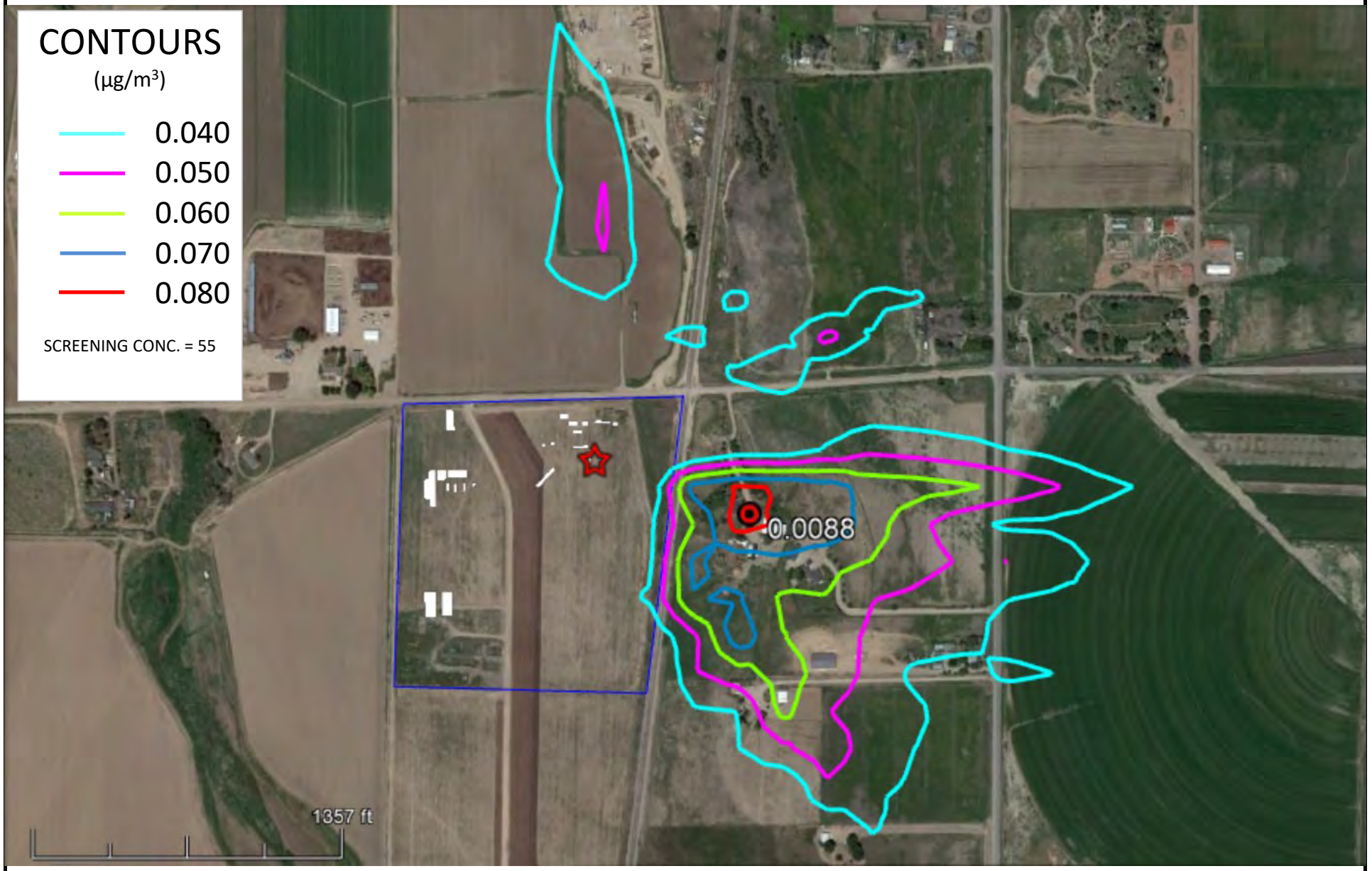


FIGURE 11B - FORMALDEHYDE MAP (SHORT-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
- AIRS ID 001
- MAX CONCENTRATION

NOTES
SCREENING CONC. = 55
UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/24/2023
SCALE: See Above
DRAWN BY: JL

antea group
11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

FIGURE 11C - FORMALDEHYDE MAP (LONG-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND	NOTES
☆ AIRS ID 001	SCREENING CONC. = 0.077
◉ MAX CONCENTRATION	FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/24/2023
SCALE: See Above
DRAWN BY: JL

antea group

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

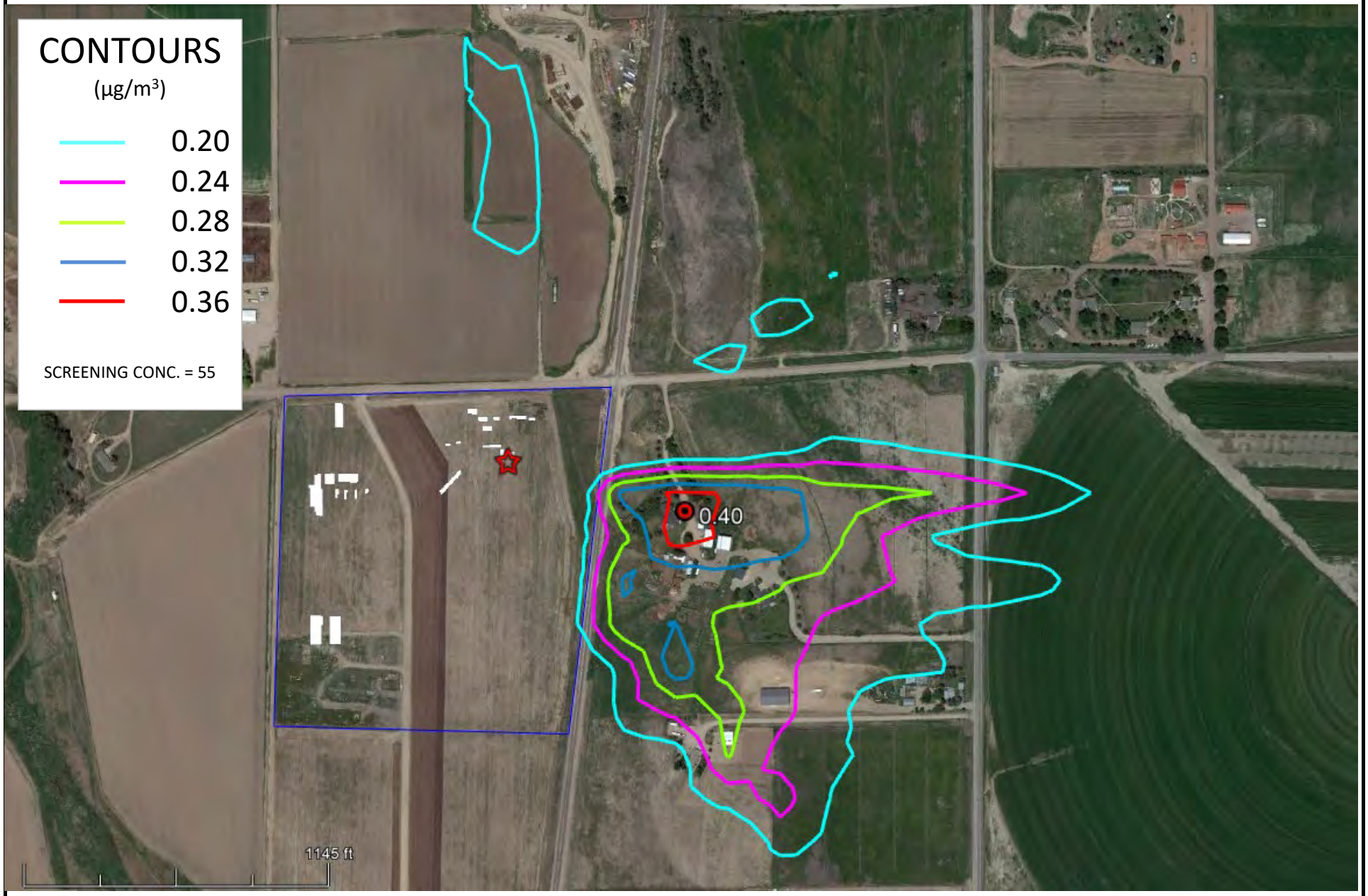


FIGURE 11D - FORMALDEHYDE MAP (SHORT-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
- AIRS ID 001
- MAX CONCENTRATION

NOTES
SCREENING CONC. = 55
UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/24/2023
SCALE: See Above
DRAWN BY: JL

antea group
11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

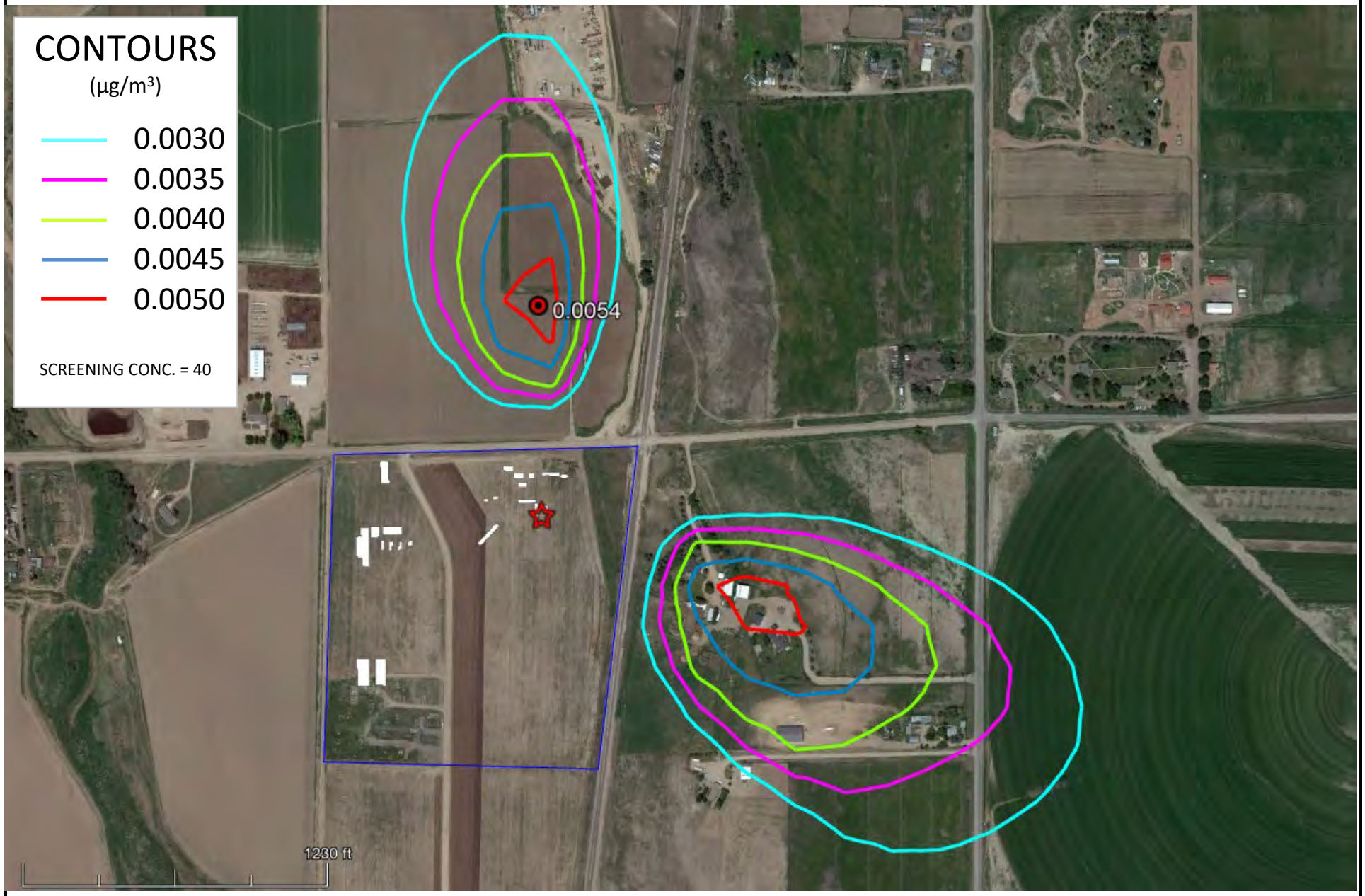


FIGURE 12A - TOLUENE MAP (LONG-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND	NOTES
☆ AIRS ID 001	SCREENING CONC. = 40
◎ MAX CONCENTRATION	FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/24/2023
SCALE: See Above
DRAWN BY: JL

antea group

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

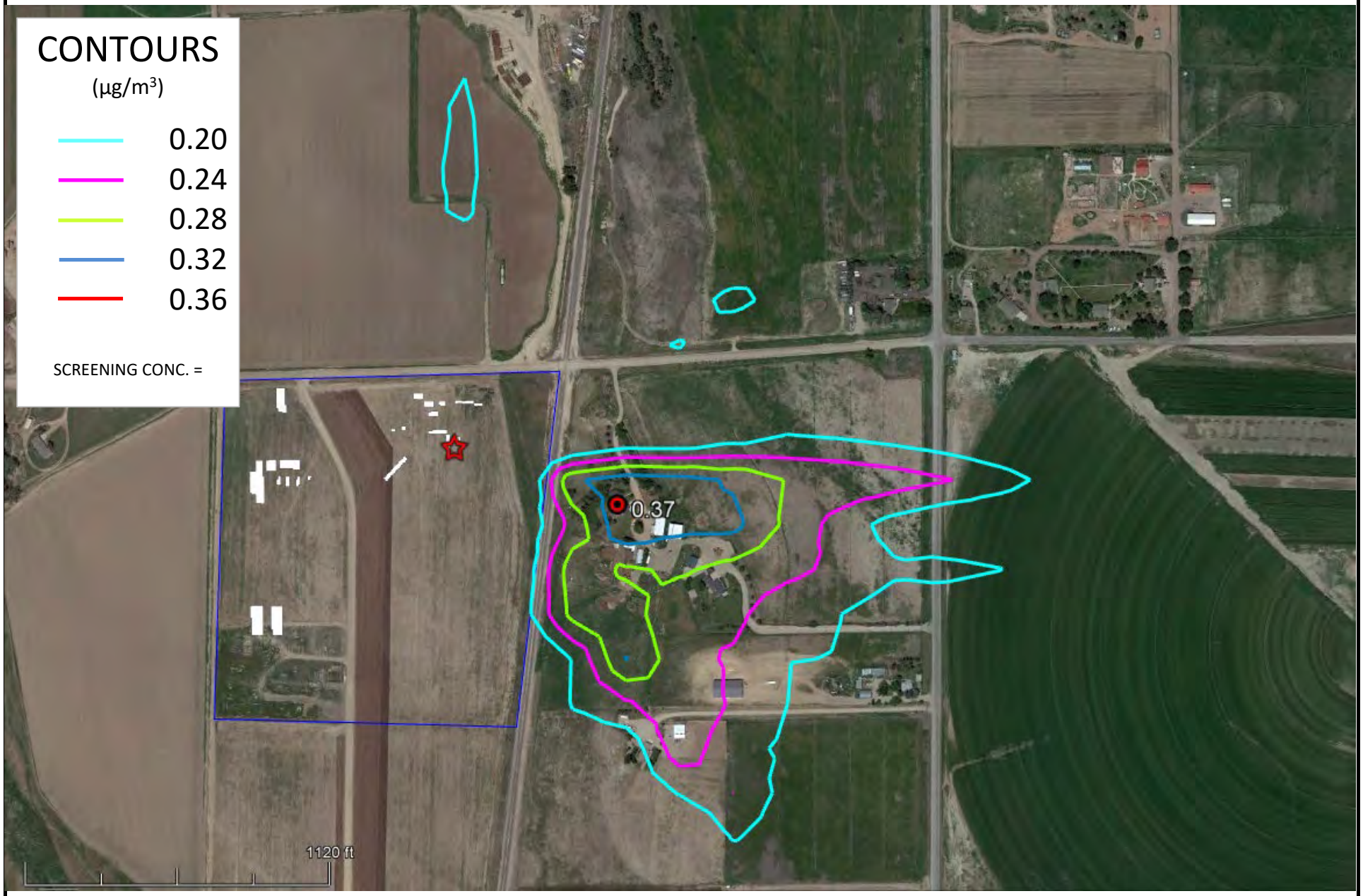


FIGURE 12B - TOLUENE MAP (SHORT-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
SCREENING CONC. = 37,000

PROJECT NO: Connell Air Model
DATE: 5/24/2023
SCALE: See Above
DRAWN BY: JL

antea group

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

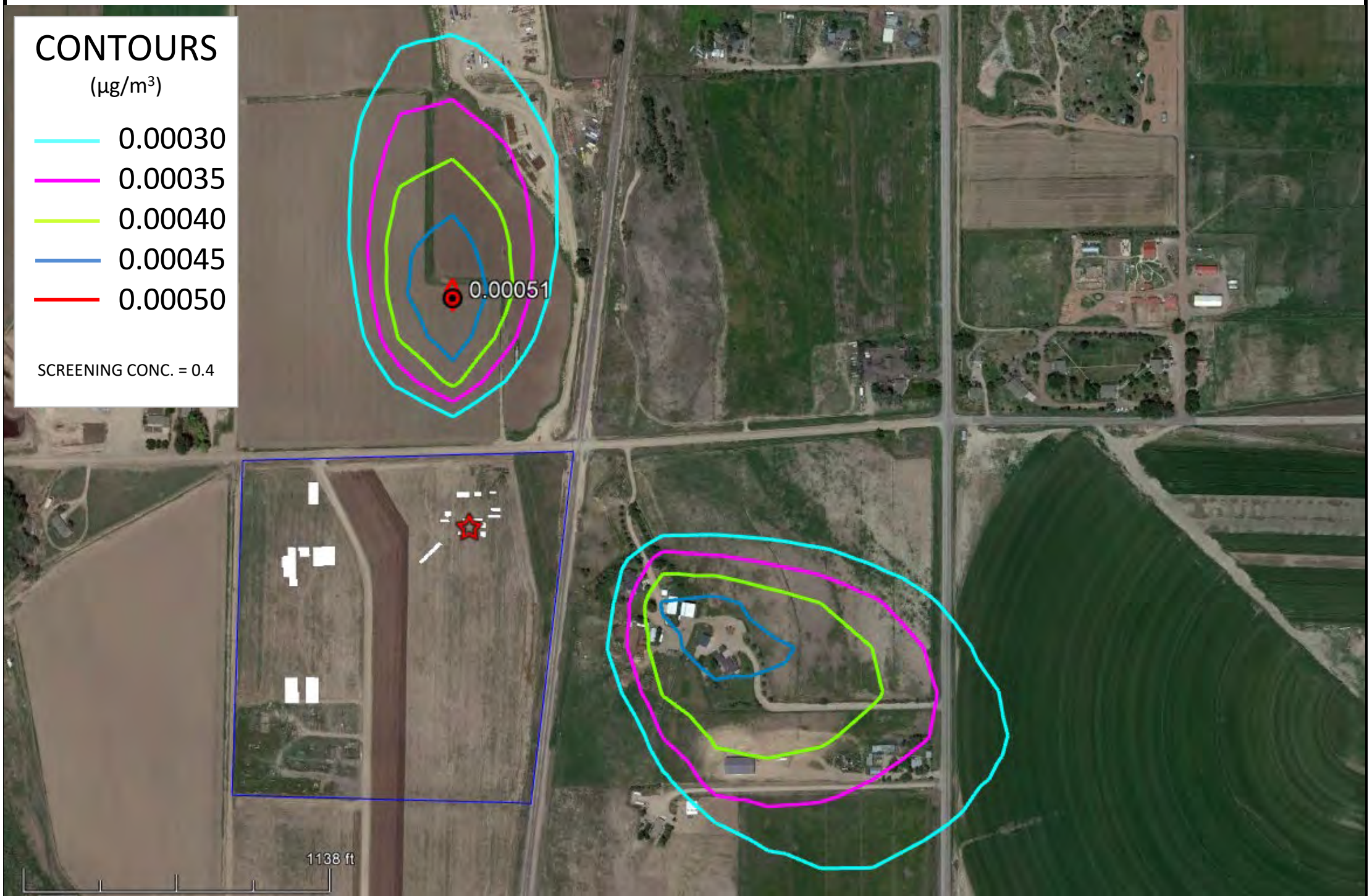


FIGURE 13A - QUINONE MAP (LONG-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
- AIRS ID 001
- MAX CONCENTRATION

NOTES
SCREENING CONC. = 0.4
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

anteagroup

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

FIGURE 18B - HCL MAP (SHORT-TERM)

Connell Resources Inc
E County Rd 66
Wellington, CO 80549
Source: Google Earth Pro, 2021

LEGEND
AIRS ID 001
MAX CONCENTRATION

NOTES
SCREENING CONC. = 190
FIGURE UNITS = µg/m³

PROJECT NO: Connell Air Model
DATE: 5/10/2023
SCALE: See Above
DRAWN BY: JL

anteagroup

11325 N Community House Rd, Suite 420
Charlotte, North Carolina 28277

Appendix A – Emission Calculations and Supporting Documentation

Emission Calculations for Modeling
Connell Resources
Fort Collins, CO and Wellington, CO

Permit Limits

Drum Mixer:	400	tons per hour
HMA Production Limit (tons/yr):	300,000	Air Construction Permit OOLR076
HMA Production Limit (hrs/yr):	750	(@maximum production rate w/ maximum Drum Mixer rate)
HMA Production Limit (hrs/yr):	1,154	(@nominal actual production rate)
Nominal Production Rate:	260	tons per hr

Natural Gas or Propane

Criteria Pollutant	Emission Factor (lb/ton asphalt produced) (Ctl)	Emission Factor Reference	Actual (lbs/hr)	Potential (lbs/hr)	Actual (tpy)	Potential (tpy)	Permit Limits (tpy)
PM	0.0177	AP-42, Table 11.1-3	4.60	7.08	2.7	2.7	2.7
PM-10	0.0041	AP-42, Table 11.1-3	1.07	1.64	0.6	0.6	0.7
PM-2.5	0.0010	AP-42, Table 11.1-4	0.26	0.40	0.2	0.2	0.2
NOx	0.026	AP-42, Table 11.1-7	6.76	10.40	3.9	3.9	8.3
SO_2	0.0034	AP-42, Table 11.1-8	0.88	1.36	0.5	0.5	8.7
VOC	0.0320	AP-42, Table 11.1-7	8.32	12.80	4.8	4.8	4.8
CO	0.13	stack tests	33.80	52.00	19.5	19.5	19.5

- Actual Emissions (tpy) = Actual (lbs/hr) x Nominal Production Rate (hrs/yr) / 2,000 lbs/yr
- Potential Emissions (tpy) = Potential (lbs/hr) x Maximum Production Rate (hrs/yr) / 2,000 lbs/yr

Waste Oil

Criteria Pollutant	Emission Factor (lb/ton asphalt produced) (Ctl)	Emission Factor Reference	Actual (lbs/hr)	Potential (lbs/hr)	Actual (tpy)	Potential (tpy)	Permit Limits (tpy)
PM	0.0177	AP-42, Table 11.1-3	4.60	7.08	2.7	2.7	2.7
PM-10	0.0041	AP-42, Table 11.1-3	1.07	1.64	0.6	0.6	0.7
PM-2.5	0.0010	AP-42, Table 11.1-4	0.26	0.40	0.2	0.2	0.2
NOx	0.055	AP-42, Table 11.1-7	14.30	22.00	8.3	8.3	8.3
SO_2	0.058	AP-42, Table 11.1-8	15.08	23.20	8.7	8.7	8.7
VOC	0.0320	AP-42, Table 11.1-7	8.32	12.80	4.8	4.8	4.8
CO	0.13	stack tests	33.80	52.00	19.5	19.5	19.5

HAP Pollutant	Emission Factor (lb/ton asphalt produced	Emission Factor Reference	Actual (lbs/hr)	Potential (lbs/hr)	Actual (lbs/yr)	Potential (lbs/yr)	Permit Limits (lbs/yr)
Acetaldehyde	0.0013	AP-42, Table 11.1-10 *(p. 11.1-26)*	0.338	0.520	390	390	390
Hexane	0.00092	AP-42, Table 11.1-10 *(p. 11.1-21)*	0.2392	0.368	276	276	285.9
Formaldehyde	0.000689	Michigan Department of Environmental Quality [(1)]	0.179	0.276	206.7	206.7	930
Toluene (NG)	0.00015	AP-42, Table 11.1-10 *(p. 11.1-21)*	0.039	0.060	45	45	870
Toluene (WO)	0.0029	AP-42, Table 11.1-10 *(p. 11.1-26)*	0.754	1.160	870	870	
Quinone (NG)	0.00027	AP-42, Table 11.1-9 *(p. 11.1-19)*	0.0702	0.108	81	81	
Quinone (WO)	0.00016	AP-42, Table 11.1-10 *(p. 11.1-26)*	0.0416	0.064	48	48	
Benzene (WO), (NG)	0.00028	AP-42, Table 11.1-9 *(p. 11.1-20)*	0.0728	0.112	84	84	
Ethylbenzene (WO), (NG)	0.0022	AP-42, Table 11.1-9 *(p. 11.1-19)*	0.572	0.880	660	660	
Xylene (WO), (NG)	0.0027	AP-42, Table 11.1-9 *(p. 11.1-19)*	0.702	1.080	810	810	
Total PAH (NG)	0.00011	AP-42, Table 11.1-10 *(p. 11.1-19)*	0.0286	0.044	33	33	
Total PAH (WO)	0.00023	AP-42, Table 11.1-9 *(p. 11.1-20)*	0.0598	0.092	69	69	
HCl (WO - Only)., NG - ND)	0.00021	AP-42, Table 11.1-8 *(p. 11.1-18)*	0.0546	0.084	63	63	

NG = Natural Gas
WO = Waste Oil
ND = Non Detect

[(1)] "*Eliminate the Manatory Testing Requirements for Toxic Air Contaminates for Hot Mix Asphalt Plants in Michigan* ", Michigan Department of Environmental Quality - Air Division, June 1, 2012

- Actual (lbs/hr) = EF x Nominal Production Rate (tons/hr)
- Actual (lbs/hr) = EF x Maximum Drum Mixer Production Rate (tons/hr)
- Potential (lbs/yr) = Actual (lbs/hr) x Nominal Production Rate (hrs/yr)
- Actual (lbs/yr) = Actual (lbs/hr) x Maximum Nominal Production Rate (hrs/yr)

Appendix B – AerMod Model Output

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** MODEL SETUP OPTIONS SUMMARY ***

** Model Options Selected:

* Model Uses Regulatory DEFAULT Options
* Model Is Setup For Calculation of Average CONCentration Values.
* NO GAS DEPOSITION Data Provided.
* NO PARTICLE DEPOSITION Data Provided.
* Model Uses NO DRY DEPLETION. DDPLETE = F
* Model Uses NO WET DEPLETION. WETDPLT = F
* Stack-tip Downwash.
* Model Accounts for ELEVated Terrain Effects.
* Use Calms Processing Routine.
* Use Missing Data Processing Routine.
* No Exponential Decay.
* Model Uses RURAL Dispersion Only.
* BULKRN - Use BULKRN Delta-T and SolarRad option for SBL in AERMET
* Model Assumes No FLAGPOLE Receptor Heights.
* The User Specified a Pollutant Type of: HEXANE

**Model Calculates 1 Short Term Average(s) of: 1-HR
and Calculates ANNUAL Averages

**This Run Includes: 1 Source(s); 1 Source Group(s); and 3106 Receptor(s)

with: 1 POINT(s), including

0 POINTCAP(s) and 0 POINTHOR(s)

and: 0 VOLUME source(s)

and: 0 AREA type source(s)

and: 0 LINE source(s)

and: 0 RLINE/RLINEXT source(s)

and: 0 OPENPIT source(s)

and: 0 BUOYANT LINE source(s) with a total of 0 line(s)

and: 0 SWPOINT source(s)

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 22112

**Output Options Selected:

Model Outputs Tables of ANNUAL Averages by Receptor

Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours

m for Missing Hours

b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1730.68 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0

Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07

Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 3.9 MB of RAM.

**Input Runstream File: C:\Users\jonahl\Antea USA, Inc\Connell Resources Inc-Connell - General\Air Modeling\BEEST Model\

**Output Print File: C:\Users\jonahl\Antea USA, Inc\Connell Resources Inc-Connell - General\Air Modeling\BEEST Model\

**File for Summary of Results: C:\Users\jonahl\Antea USA, Inc\Connell Resources Inc-Connell - General\Air Modeling\BEEST Model\

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***

(1=YES; 0=NO)

1 1 1

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***

(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling Met Version: 22112

Profile file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling

Surface format: FREE

Profile format: FREE

Surface station no.: 0 Upper air station no.: 23062

Name: UNKNOWN Name: DENVER WSFO, CO

Year: 2006 Year: 2006

First 24 hours of scalar data

YR MO DY JDY HR H0 U* W* DT/DZ ZICNV ZIMCH M-O LEN Z0 BOWEN ALBEDO REF WS WD HT REF TA HT

- -

06 01 01 1 01 -26.0 0.162 -9.000 -9.000 -999. 157. 11.8 0.01 1.89 1.00 4.43 326. 10.0 280.1 2.0

06 01 01 1 02 -58.1 0.325 -9.000 -9.000 -999. 445. 42.5 0.01 1.89 1.00 6.57 310. 10.0 281.4
2.0

06 01 01 1 03 -33.0 0.292 -9.000 -9.000 -999. 380. 54.5 0.01 1.89 1.00 5.72 272. 10.0 281.0
2.0

06 01 01 1 04 -14.9 0.128 -9.000 -9.000 -999. 134. 10.2 0.01 1.89 1.00 3.67 320. 10.0 279.8
2.0

06 01 01 1 05 -13.5 0.124 -9.000 -9.000 -999. 105. 10.1 0.01 1.89 1.00 3.71 337. 10.0 279.0
2.0

06 01 01 1 06 -18.3 0.176 -9.000 -9.000 -999. 177. 21.3 0.01 1.89 1.00 4.29 344. 10.0 278.3
2.0

06 01 01 1 07 -34.9 0.286 -9.000 -9.000 -999. 367. 48.1 0.01 1.89 1.00 5.68 327. 10.0 279.3
2.0

06 01 01 1 08 -39.7 0.440 -9.000 -9.000 -999. 701. 154.4 0.01 1.89 1.00 7.96 307. 10.0 279.8
2.0

06 01 01 1 09 -17.3 0.580 -9.000 -9.000 -999. 1058. 810.0 0.01 1.89 0.43 10.10 287. 10.0 279.4
2.0

06 01 01 1 10 38.3 0.682 0.602 0.005 164. 1349. -597.0 0.01 1.89 0.31 11.67 301. 10.0 280.9
2.0

06 01 01 1 11 83.4 0.893 1.120 0.005 486. 2020. -616.6 0.01 1.89 0.26 15.29 291. 10.0 281.4
2.0

06 01 01 1 12 97.2 0.889 1.326 0.005 693. 2013. -521.8 0.01 1.89 0.24 15.20 293. 10.0 281.3
2.0

06 01 01 1 13 137.5 0.968 1.629 0.005 909. 2279. -476.9 0.01 1.89 0.24 16.54 291. 10.0
281.3 2.0

06 01 01 1 14 122.9 0.912 1.653 0.005 1063. 2100. -445.7 0.01 1.89 0.25 15.56 290. 10.0
281.0 2.0

06 01 01 1 15 67.7 0.795 1.385 0.005 1138. 1727. -536.6 0.01 1.89 0.30 13.59 295. 10.0
280.1 2.0

06 01 01 1 16 0.0 0.715 -9.000 -9.000 -999. 1464. 8888.0 0.01 1.89 0.41 12.34 301. 10.0 279.0
2.0

06 01 01 1 17 0.0 0.673 -9.000 -9.000 -999. 1330. 8888.0 0.01 1.89 0.72 11.62 304. 10.0 277.1
2.0

06 01 01 1 18 0.0 0.546 -9.000 -9.000 -999. 987. 8888.0 0.01 1.89 1.00 9.43 293. 10.0 275.9
2.0

06 01 01 1 19 -46.9 0.630 -9.000 -9.000 -999. 1199. 388.5 0.01 1.89 1.00 11.09 294. 10.0 276.2
2.0

06 01 01 1 20 -49.7 0.337 -9.000 -9.000 -999. 566. 55.9 0.01 1.89 1.00 6.57 310. 10.0 275.6
2.0

06 01 01 1 21 -29.5 0.194 -9.000 -9.000 -999. 235. 17.9 0.01 1.89 1.00 4.69 313. 10.0 274.4
2.0

06 01 01 1 22 -29.9 0.238 -9.000 -9.000 -999. 279. 32.8 0.01 1.89 1.00 5.32 338. 10.0 275.8
2.0

06 01 01 1 23 -15.8 0.134 -9.000 -9.000 -999. 123. 11.1 0.01 1.89 1.00 3.67 241. 10.0 274.5
2.0

06 01 01 1 24 -19.1 0.117 -9.000 -9.000 -999. 96. 6.1 0.01 1.89 1.00 3.98 279. 10.0 273.6
2.0

First hour of profile data

YR MO DY HR HEIGHT F WDIR WSPD AMB_TMP sigmaA sigmaW sigmaV

06 01 01 01 2.0 0 -999. -99.00 280.1 99.0 -99.00 -99.00

06 01 01 01 10.0 0 326. 4.43 282.0 5.4 -99.00 0.42

06 01 01 01 60.0 1 316. 5.10 283.1 6.1 -99.00 0.54

F indicates top of profile (=1) or below (=0)

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF HEXANE IN MICROGRAMS/M**3 **

NETWORK

GROUP ID AVERAGE CONC RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

- -

ALL 1ST HIGHEST VALUE IS 0.00178 AT (499450.00, 4508500.00, 1603.57, 1603.57, 0.00) DC

2ND HIGHEST VALUE IS 0.00174 AT (499450.00, 4508450.00, 1603.33, 1603.33, 0.00) DC

3RD HIGHEST VALUE IS 0.00173 AT (499700.00, 4508150.00, 1610.72, 1610.72, 0.00) DC

4TH HIGHEST VALUE IS 0.00170 AT (499450.00, 4508550.00, 1603.86, 1603.86, 0.00) DC

5TH HIGHEST VALUE IS 0.00168 AT (499750.00, 4508100.00, 1608.86, 1608.86, 0.00) DC

6TH HIGHEST VALUE IS 0.00166 AT (499750.00, 4508150.00, 1610.15, 1610.15, 0.00) DC

7TH HIGHEST VALUE IS 0.00165 AT (499700.00, 4508100.00, 1609.85, 1609.85, 0.00) DC

8TH HIGHEST VALUE IS 0.00164 AT (499400.00, 4508500.00, 1603.34, 1603.34, 0.00) DC

9TH HIGHEST VALUE IS 0.00164 AT (499800.00, 4508100.00, 1606.47, 1606.47, 0.00) DC

10TH HIGHEST VALUE IS 0.00161 AT (499400.00, 4508550.00, 1603.60, 1603.60, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF HEXANE IN MICROGRAMS/M**3 **

DATE NETWORK

GROUP ID AVERAGE CONC (YYMMDDHH) RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

- -

ALL HIGH 1ST HIGH VALUE IS 0.12284 ON 06102824: AT (499600.00, 4508200.00, 1608.71, 1608.71, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** AERMOD - VERSION 22112 *** *** Title One *** 05/26/23

*** AERMET - VERSION 22112 *** *** *** 09:26:25

PAGE 6

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)

A Total of 624 Warning Message(s)

A Total of 142 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 1 Calm Hours Identified

A Total of 141 Missing Hours Identified (1.61 Percent)

******** FATAL ERROR MESSAGES ********

*** NONE ***

******** WARNING MESSAGES ********

ME W181 3169 MEOPEN: BULKRN Delta-T & SolarRad option for SBL was used in AERMET

MX W403 3169 PFLCNV: Turbulence data is being used w/o ADJ_U* option SigA Data

MX W479 24 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 29 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 30 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 31 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 48 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 51 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 52 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 53 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 141 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 143 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.877

MX W479 147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 151 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 215 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 216 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 221 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 222 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.588

MX W479 244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 291 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.544

MX W479 296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 308 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.572

MX W479 312 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 313 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.700

MX W479 314 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 317 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.795

MX W479 318 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 320 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 321 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 340 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 342 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 475 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.580

MX W479 479 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 482 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.746

MX W479 483 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 484 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 486 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 487 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.681

MX W479 488 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.697

MX W479 489 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.921

MX W479 509 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 524 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 526 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 527 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 528 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.926

MX W479 529 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.676

MX W479 530 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.808

MX W479 531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.740

MX W479 532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.537

MX W479 533 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.621

MX W479 534 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.830

MX W479 535 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 554 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 555 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 556 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 573 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.536

MX W479 574 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.241

MX W479 575 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 576 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.562

MX W479 577 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 578 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.213

MX W479 579 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 580 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 581 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.713

MX W479 582 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.678

MX W479 583 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.869

MX W479 584 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 595 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 597 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.667

MX W479 599 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.596

MX W479 600 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 601 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.705

MX W479 605 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.665

MX W479 632 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 725 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 727 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 775 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 822 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 837 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 838 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 839 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 932 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 1029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 1031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479 1034 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 1035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 1051 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 1052 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 1053 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.884

MX W479 1054 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.859

MX W479	1055	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.766
MX W479	1056	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.677
MX W479	1060	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	1061	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.639
MX W479	1197	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	1198	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.709
MX W479	1199	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	1200	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.530
MX W479	1201	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.663
MX W479	1202	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.650
MX W479	1203	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.590
MX W479	1204	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.726
MX W479	1205	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.750
MX W479	1206	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.700
MX W479	1208	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	1218	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	1219	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.824
MX W479	1220	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	1221	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.731
MX W479	1222	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	1223	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	1224	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	1225	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	1226	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753
MX W479	1227	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	1228	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	1229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602
MX W479	1230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	1231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753

MX W479	1243	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	1244	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	1245	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	1276	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	1277	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	1278	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.729
MX W479	1293	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.683
MX W479	1294	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.851
MX W479	1295	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602
MX W479	1296	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.611
MX W479	1297	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.576
MX W479	1300	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.634
MX W479	1301	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.723
MX W479	1302	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561
MX W479	1303	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.516
MX W479	1316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.692
MX W479	1343	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	1344	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.720
MX W479	1345	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	1346	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.501
MX W479	1347	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.663
MX W479	1348	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	1351	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	1363	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.558
MX W479	1365	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.696
MX W479	1373	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.592
MX W479	1374	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.644
MX W479	1375	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.644
MX W479	1389	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.622

MX W479	1392	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	1394	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.577
MX W479	1395	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	1396	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.671
MX W479	1397	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	1441	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	1442	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	1483	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.647
MX W479	1532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	1537	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	1539	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.613
MX W479	1540	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	1541	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.648
MX W479	1543	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614
MX W479	1566	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.569
MX W479	1661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.575
MX W479	1989	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	1990	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	1991	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	1993	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.563
MX W479	1994	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.534
MX W479	2086	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	2088	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	2089	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	2093	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	2228	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.579
MX W479	2229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	2230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.693
MX W479	2231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.634

MX W479 2232 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.632

MX W479 2234 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 2235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 2253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 2254 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 2255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.755

MX W479 2262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 2348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 2349 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2350 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 2351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2352 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.834

MX W479 2353 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 2354 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2355 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.560

MX W479 2356 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 2373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.752

MX W479 2374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 2378 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 2379 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 2380 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 2382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 2399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.920

MX W479 2421 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2422 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 2424 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 2425 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 2428 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 2429 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 2430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 2445 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2447 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.779

MX W479 2448 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 2449 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.733

MX W479 2450 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 2468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.019

MX W479 2470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.976

MX W479 2471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.882

MX W479 2472 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.650

MX W479 2542 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.826

MX W479 2544 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 2545 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.629

MX W479 2546 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.769

MX W479 2547 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.656

MX W479 2548 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.679

MX W479 2549 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.853

MX W479 2550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2615 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 2616 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 2617 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2639 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 2640 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2641 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.777

MX W479 2643 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 2645 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479	2646	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	2660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	2663	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.896
MX W479	2664	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	2666	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	2669	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	2670	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.500
MX W479	2763	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.504
MX W479	2783	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.567
MX W479	2786	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.588
MX W479	2788	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.748
MX W479	2789	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	2832	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.501
MX W479	2833	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.506
MX W479	2900	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	2901	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.673
MX W479	2902	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.730
MX W479	2903	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	2905	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	2906	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753
MX W479	2907	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	3045	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.549
MX W479	3047	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.554
MX W479	3048	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	3148	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	3149	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	3168	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	3169	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	3170	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.601

MX W479	3171	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.796
MX W479	3172	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	3173	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.889
MX W479	3174	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	3239	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	3262	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.633
MX W479	3263	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	3289	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.546
MX W479	3290	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.586
MX W479	3291	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.607
MX W479	3293	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	3294	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	3313	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	3316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.595
MX W479	3337	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	3338	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.521
MX W479	3339	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	3363	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.584
MX W479	3364	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	3365	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	3366	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.576
MX W479	3382	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.620
MX W479	3383	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.727
MX W479	3384	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.606
MX W479	3453	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.648
MX W479	3454	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.711
MX W479	3457	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	3509	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.654
MX W479	3525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614

MX W479 3671 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.541

MX W479 3674 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 3693 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 3748 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.562

MX W479 3792 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.536

MX W479 3796 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 4029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.848

MX W479 4030 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.707

MX W479 4031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 4035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 4036 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.645

MX W479 4037 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 4057 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.502

MX W479 4080 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 4101 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.545

MX W479 4102 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 4103 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.847

MX W479 4104 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 4105 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 4172 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.682

MX W479 4173 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.824

MX W479 4227 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 4297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 4298 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.590

MX W479 4301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 4493 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 4586 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 4629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.548

MX W479 4630 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 4652 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 4653 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.685

MX W479 4654 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 4656 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 4657 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.903

MX W479 4658 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.975

MX W479 4659 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.826

MX W479 4660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.741

MX W479 4661 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.888

MX W479 4677 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.524

MX W479 4679 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 4680 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.591

MX W479 4685 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.731

MX W479 4724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 4996 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.544

MX W479 5331 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.662

MX W479 5332 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 5471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 5472 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 5475 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 5614 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.669

MX W479 5615 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 5621 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 5622 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.623

MX W479 5790 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 5804 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 5805 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 5809 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 5812 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.675

MX W479 5813 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.645

MX W479 5814 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.523

MX W479 5979 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 5980 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 6120 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 6121 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 6125 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 6126 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 6142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 6146 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 6147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.573

MX W479 6148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.779

MX W479 6149 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.883

MX W479 6150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.860

MX W479 6267 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 6268 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 6271 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 6286 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 6292 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.577

MX W479 6294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.615

MX W479 6405 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 6406 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.887

MX W479 6407 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 6408 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.541

MX W479 6409 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 6410 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.740

MX W479 6411 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 6413 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 6430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479	6431	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	6435	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.023
MX W479	6436	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	6486	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	6501	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.822
MX W479	6524	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.557
MX W479	6525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.600
MX W479	6526	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	6528	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.612
MX W479	6529	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	6530	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	6531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.662
MX W479	6532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.680
MX W479	6548	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.718
MX W479	6549	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.739
MX W479	6550	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.767
MX W479	6553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.592
MX W479	6554	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.776
MX W479	6555	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.581
MX W479	6556	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	6558	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.988
MX W479	6559	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.766
MX W479	6571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	6572	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.870
MX W479	6573	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.668
MX W479	6574	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.705
MX W479	6577	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.791
MX W479	6578	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	6579	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.622

MX W479	6580	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	6581	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.872
MX W479	6582	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.704
MX W479	6583	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	6596	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	6602	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	6791	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.545
MX W479	6835	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.564
MX W479	6836	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	6868	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	6870	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.516
MX W479	6890	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	6912	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.576
MX W479	6913	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	6914	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	6915	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	6917	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	6918	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	7014	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7099	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.534
MX W479	7100	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.759
MX W479	7101	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7103	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	7111	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	7123	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	7126	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.603
MX W479	7127	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	7129	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	7130	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.683

MX W479	7131	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	7132	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.525
MX W479	7195	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.554
MX W479	7196	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	7199	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	7207	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	7220	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.644
MX W479	7243	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.628
MX W479	7244	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.575
MX W479	7246	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.712
MX W479	7252	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.629
MX W479	7253	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	7255	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.681
MX W479	7316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.757
MX W479	7317	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.558
MX W479	7318	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.570
MX W479	7319	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	7321	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602
MX W479	7323	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	7324	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.578
MX W479	7326	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	7340	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.691
MX W479	7343	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.510
MX W479	7345	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	7346	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	7351	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	7363	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	7364	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.215
MX W479	7366	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.516

MX W479	7367	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.612
MX W479	7368	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.799
MX W479	7369	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.518
MX W479	7388	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	7389	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	7390	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.725
MX W479	7391	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.797
MX W479	7393	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7395	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	7396	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	7397	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	7399	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.656
MX W479	7400	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.686
MX W479	7446	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.641
MX W479	7462	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.761
MX W479	7468	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	7469	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.811
MX W479	7470	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.856
MX W479	7471	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.803
MX W479	7484	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.540
MX W479	7513	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.558
MX W479	7514	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.585
MX W479	7531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.594
MX W479	7543	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	7585	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.532
MX W479	7586	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.831
MX W479	7587	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.573
MX W479	7602	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.586
MX W479	7603	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561

MX W479	7660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.708
MX W479	7661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7681	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	7682	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7683	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.707
MX W479	7684	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.628
MX W479	7753	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.641
MX W479	7755	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.502
MX W479	7794	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.607
MX W479	7796	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.032
MX W479	7797	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.212
MX W479	7798	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.800
MX W479	7801	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.637
MX W479	7802	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.906
MX W479	7803	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	7804	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	7805	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.048
MX W479	7806	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.021
MX W479	7807	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.755
MX W479	7819	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.902
MX W479	7867	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	7869	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	7873	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	7878	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	7879	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	7891	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	7892	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.532
MX W479	7894	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	7896	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556

MX W479	7897	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.506
MX W479	7898	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.761
MX W479	7899	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.773
MX W479	7900	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	7901	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.852
MX W479	7941	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	7948	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7989	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.671
MX W479	7990	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	7991	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	7992	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.622
MX W479	7993	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.288
MX W479	7994	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.608
MX W479	7996	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.606
MX W479	8011	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	8041	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.505
MX W479	8042	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	8062	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	8067	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	8086	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.668
MX W479	8087	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.504
MX W479	8088	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.618
MX W479	8089	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	8090	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.585
MX W479	8091	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	8107	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.613
MX W479	8108	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	8111	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.564
MX W479	8112	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.633

MX W479	8116	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	8117	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.838
MX W479	8118	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.725
MX W479	8119	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.001
MX W479	8120	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.649
MX W479	8190	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	8191	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	8192	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	8202	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.572
MX W479	8203	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.563
MX W479	8204	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.511
MX W479	8206	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	8208	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.642
MX W479	8209	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.717
MX W479	8210	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.670
MX W479	8211	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	8213	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.701
MX W479	8214	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.584
MX W479	8215	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.714
MX W479	8216	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.687
MX W479	8229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	8230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	8231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	8235	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	8238	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	8301	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.642
MX W479	8304	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	8306	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.685
MX W479	8307	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574

MX W479	8311	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.550
MX W479	8350	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.596
MX W479	8356	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.511
MX W479	8358	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	8360	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	8427	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.593
MX W479	8428	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.548
MX W479	8442	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	8445	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	8447	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	8448	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	8450	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	8451	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.695
MX W479	8452	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.533
MX W479	8514	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	8553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.944
MX W479	8567	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.619
MX W479	8570	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.535
MX W479	8571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	8595	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626
MX W479	8646	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	8660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.567
MX W479	8730	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	8734	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	8735	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.560
MX W479	8760	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** MODEL SETUP OPTIONS SUMMARY ***

** Model Options Selected:

* Model Uses Regulatory DEFAULT Options
* Model Is Setup For Calculation of Average CONCentration Values.
* NO GAS DEPOSITION Data Provided.
* NO PARTICLE DEPOSITION Data Provided.
* Model Uses NO DRY DEPLETION. DDPLETE = F
* Model Uses NO WET DEPLETION. WETDPLT = F
* Stack-tip Downwash.
* Model Accounts for ELEVated Terrain Effects.
* Use Calms Processing Routine.
* Use Missing Data Processing Routine.
* No Exponential Decay.
* Model Uses RURAL Dispersion Only.
* BULKRN - Use BULKRN Delta-T and SolarRad option for SBL in AERMET
* Model Assumes No FLAGPOLE Receptor Heights.
* The User Specified a Pollutant Type of: FORMALDE

**Model Calculates 1 Short Term Average(s) of: 1-HR
and Calculates ANNUAL Averages

**This Run Includes: 1 Source(s); 1 Source Group(s); and 3106 Receptor(s)

with: 1 POINT(s), including

0 POINTCAP(s) and 0 POINTHOR(s)

and: 0 VOLUME source(s)

and: 0 AREA type source(s)

and: 0 LINE source(s)

and: 0 RLINE/RLINEXT source(s)

and: 0 OPENPIT source(s)

and: 0 BUOYANT LINE source(s) with a total of 0 line(s)

and: 0 SWPOINT source(s)

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 22112

**Output Options Selected:

Model Outputs Tables of ANNUAL Averages by Receptor

Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours

m for Missing Hours

b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1730.68 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0

Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07

Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 3.9 MB of RAM.

**Input Runstream File: C:\Users\jonahl\Antea USA, Inc\Connell Resources Inc-Connell - General\Air Modeling\BEEST Model\

**Output Print File: C:\Users\jonahl\Antea USA, Inc\Connell Resources Inc-Connell - General\Air Modeling\BEEST Model\

**File for Summary of Results: C:\Users\jonahl\Antea USA, Inc\Connell Resources Inc-Connell - General\Air Modeling\BEEST Model\

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***

(1=YES; 0=NO)

1 1 1

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***

(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling
Met Version: 22112

Profile file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling

Surface format: FREE

Profile format: FREE

Surface station no.: 0 Upper air station no.: 23062

Name: UNKNOWN Name: DENVER WSFO, CO

Year: 2006 Year: 2006

First 24 hours of scalar data

YR MO DY JDY HR H0 U* W* DT/DZ ZICNV ZIMCH M-O LEN Z0 BOWEN ALBEDO REF WS WD HT REF TA HT

- -

06 01 01 1 01 -26.0 0.162 -9.000 -9.000 -999. 157. 11.8 0.01 1.89 1.00 4.43 326. 10.0 280.1 2.0

06 01 01 1 02 -58.1 0.325 -9.000 -9.000 -999. 445. 42.5 0.01 1.89 1.00 6.57 310. 10.0 281.4
2.0

06 01 01 1 03 -33.0 0.292 -9.000 -9.000 -999. 380. 54.5 0.01 1.89 1.00 5.72 272. 10.0 281.0
2.0

06 01 01 1 04 -14.9 0.128 -9.000 -9.000 -999. 134. 10.2 0.01 1.89 1.00 3.67 320. 10.0 279.8
2.0

06 01 01 1 05 -13.5 0.124 -9.000 -9.000 -999. 105. 10.1 0.01 1.89 1.00 3.71 337. 10.0 279.0
2.0

06 01 01 1 06 -18.3 0.176 -9.000 -9.000 -999. 177. 21.3 0.01 1.89 1.00 4.29 344. 10.0 278.3
2.0

06 01 01 1 07 -34.9 0.286 -9.000 -9.000 -999. 367. 48.1 0.01 1.89 1.00 5.68 327. 10.0 279.3
2.0

06 01 01 1 08 -39.7 0.440 -9.000 -9.000 -999. 701. 154.4 0.01 1.89 1.00 7.96 307. 10.0 279.8
2.0

06 01 01 1 09 -17.3 0.580 -9.000 -9.000 -999. 1058. 810.0 0.01 1.89 0.43 10.10 287. 10.0 279.4
2.0

06 01 01 1 10 38.3 0.682 0.602 0.005 164. 1349. -597.0 0.01 1.89 0.31 11.67 301. 10.0 280.9
2.0

06 01 01 1 11 83.4 0.893 1.120 0.005 486. 2020. -616.6 0.01 1.89 0.26 15.29 291. 10.0 281.4
2.0

06 01 01 1 12 97.2 0.889 1.326 0.005 693. 2013. -521.8 0.01 1.89 0.24 15.20 293. 10.0 281.3
2.0

06 01 01 1 13 137.5 0.968 1.629 0.005 909. 2279. -476.9 0.01 1.89 0.24 16.54 291. 10.0
281.3 2.0

06 01 01 1 14 122.9 0.912 1.653 0.005 1063. 2100. -445.7 0.01 1.89 0.25 15.56 290. 10.0
281.0 2.0

06 01 01 1 15 67.7 0.795 1.385 0.005 1138. 1727. -536.6 0.01 1.89 0.30 13.59 295. 10.0
280.1 2.0

06 01 01 1 16 0.0 0.715 -9.000 -9.000 -999. 1464. 8888.0 0.01 1.89 0.41 12.34 301. 10.0 279.0
2.0

06 01 01 1 17 0.0 0.673 -9.000 -9.000 -999. 1330. 8888.0 0.01 1.89 0.72 11.62 304. 10.0 277.1
2.0

06 01 01 1 18 0.0 0.546 -9.000 -9.000 -999. 987. 8888.0 0.01 1.89 1.00 9.43 293. 10.0 275.9
2.0

06 01 01 1 19 -46.9 0.630 -9.000 -9.000 -999. 1199. 388.5 0.01 1.89 1.00 11.09 294. 10.0 276.2
2.0

06 01 01 1 20 -49.7 0.337 -9.000 -9.000 -999. 566. 55.9 0.01 1.89 1.00 6.57 310. 10.0 275.6
2.0

06 01 01 1 21 -29.5 0.194 -9.000 -9.000 -999. 235. 17.9 0.01 1.89 1.00 4.69 313. 10.0 274.4
2.0

06 01 01 1 22 -29.9 0.238 -9.000 -9.000 -999. 279. 32.8 0.01 1.89 1.00 5.32 338. 10.0 275.8
2.0

06 01 01 1 23 -15.8 0.134 -9.000 -9.000 -999. 123. 11.1 0.01 1.89 1.00 3.67 241. 10.0 274.5
2.0

06 01 01 1 24 -19.1 0.117 -9.000 -9.000 -999. 96. 6.1 0.01 1.89 1.00 3.98 279. 10.0 273.6
2.0

First hour of profile data

YR MO DY HR HEIGHT F WDIR WSPD AMB_TMP sigmaA sigmaW sigmaV

06 01 01 01 2.0 0 -999. -99.00 280.1 99.0 -99.00 -99.00

06 01 01 01 10.0 0 326. 4.43 282.0 5.4 -99.00 0.42

06 01 01 01 60.0 1 316. 5.10 283.1 6.1 -99.00 0.54

F indicates top of profile (=1) or below (=0)

*** AERMOD - VERSION 22112 *** *** Title One *** 05/24/23

*** AERMET - VERSION 22112 *** *** *** 14:28:58

PAGE 4

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF FORMALDE IN MICROGRAMS/M**3 **

NETWORK

GROUP ID AVERAGE CONC RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

ALL 1ST HIGHEST VALUE IS 0.00580 AT (499450.00, 4508500.00, 1603.57, 1603.57, 0.00) DC

2ND HIGHEST VALUE IS 0.00567 AT (499450.00, 4508450.00, 1603.33, 1603.33, 0.00) DC

3RD HIGHEST VALUE IS 0.00563 AT (499700.00, 4508150.00, 1610.72, 1610.72, 0.00) DC

4TH HIGHEST VALUE IS 0.00553 AT (499450.00, 4508550.00, 1603.86, 1603.86, 0.00) DC

5TH HIGHEST VALUE IS 0.00547 AT (499750.00, 4508100.00, 1608.86, 1608.86, 0.00) DC

6TH HIGHEST VALUE IS 0.00540 AT (499750.00, 4508150.00, 1610.15, 1610.15, 0.00) DC

7TH HIGHEST VALUE IS 0.00537 AT (499700.00, 4508100.00, 1609.85, 1609.85, 0.00) DC

8TH HIGHEST VALUE IS 0.00534 AT (499400.00, 4508500.00, 1603.34, 1603.34, 0.00) DC

9TH HIGHEST VALUE IS 0.00532 AT (499800.00, 4508100.00, 1606.47, 1606.47, 0.00) DC

10TH HIGHEST VALUE IS 0.00523 AT (499400.00, 4508550.00, 1603.60, 1603.60, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF FORMALDE IN MICROGRAMS/M**3 **

DATE NETWORK

GROUP ID AVERAGE CONC (YYMMDDHH) RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

- -

ALL HIGH 1ST HIGH VALUE IS 0.39946 ON 06102824: AT (499600.00, 4508200.00, 1608.71, 1608.71, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** AERMOD - VERSION 22112 *** *** Title One *** 05/24/23

*** AERMET - VERSION 22112 *** *** *** 14:28:58

PAGE 6

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)

A Total of 624 Warning Message(s)

A Total of 142 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 1 Calm Hours Identified

A Total of 141 Missing Hours Identified (1.61 Percent)

******** FATAL ERROR MESSAGES ********

*** NONE ***

******** WARNING MESSAGES ********

ME W181 3169 MEOPEN: BULKRN Delta-T & SolarRad option for SBL was used in AERMET

MX W403 3169 PFLCNV: Turbulence data is being used w/o ADJ_U* option SigA Data

MX W479 24 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 29 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 30 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 31 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 48 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 51 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 52 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 53 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 141 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 143 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.877

MX W479 147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 151 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 215 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 216 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 221 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 222 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.588

MX W479 244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 291 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.544

MX W479 296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 308 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.572

MX W479 312 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 313 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.700

MX W479 314 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 317 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.795

MX W479 318 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 320 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 321 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 340 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 342 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 475 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.580

MX W479 479 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 482 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.746

MX W479 483 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 484 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 486 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 487 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.681

MX W479 488 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.697

MX W479 489 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.921

MX W479 509 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 524 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 526 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 527 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 528 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.926

MX W479 529 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.676

MX W479 530 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.808

MX W479 531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.740

MX W479 532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.537

MX W479 533 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.621

MX W479 534 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.830

MX W479 535 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 554 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 555 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 556 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 573 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.536

MX W479 574 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.241

MX W479 575 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 576 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.562

MX W479 577 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 578 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.213

MX W479 579 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 580 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 581 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.713

MX W479 582 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.678

MX W479 583 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.869

MX W479 584 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 595 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 597 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.667

MX W479 599 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.596

MX W479 600 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 601 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.705

MX W479 605 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.665

MX W479 632 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 725 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 727 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 775 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 822 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 837 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 838 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 839 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 932 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 1029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 1031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479 1034 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 1035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 1051 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 1052 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 1053 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.884

MX W479 1054 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.859

MX W479	1055	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.766
MX W479	1056	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.677
MX W479	1060	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	1061	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.639
MX W479	1197	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	1198	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.709
MX W479	1199	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	1200	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.530
MX W479	1201	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.663
MX W479	1202	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.650
MX W479	1203	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.590
MX W479	1204	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.726
MX W479	1205	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.750
MX W479	1206	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.700
MX W479	1208	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	1218	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	1219	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.824
MX W479	1220	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	1221	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.731
MX W479	1222	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	1223	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	1224	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	1225	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	1226	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753
MX W479	1227	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	1228	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	1229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602
MX W479	1230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	1231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753

MX W479 1243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 1244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 1245 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 1276 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 1277 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 1278 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.729

MX W479 1293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 1294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.851

MX W479 1295 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 1296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 1297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 1300 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 1301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.723

MX W479 1302 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 1303 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 1316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.692

MX W479 1343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 1344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.720

MX W479 1345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 1346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 1347 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.663

MX W479 1348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 1363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 1365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.696

MX W479 1373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 1374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1375 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.622

MX W479	1392	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	1394	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.577
MX W479	1395	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	1396	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.671
MX W479	1397	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	1441	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	1442	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	1483	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.647
MX W479	1532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	1537	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	1539	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.613
MX W479	1540	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	1541	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.648
MX W479	1543	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614
MX W479	1566	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.569
MX W479	1661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.575
MX W479	1989	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	1990	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	1991	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	1993	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.563
MX W479	1994	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.534
MX W479	2086	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	2088	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	2089	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	2093	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	2228	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.579
MX W479	2229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	2230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.693
MX W479	2231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.634

MX W479 2232 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.632

MX W479 2234 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 2235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 2253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 2254 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 2255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.755

MX W479 2262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 2348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 2349 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2350 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 2351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2352 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.834

MX W479 2353 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 2354 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2355 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.560

MX W479 2356 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 2373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.752

MX W479 2374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 2378 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 2379 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 2380 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 2382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 2399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.920

MX W479 2421 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2422 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 2424 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 2425 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 2428 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 2429 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 2430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 2445 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2447 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.779

MX W479 2448 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 2449 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.733

MX W479 2450 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 2468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.019

MX W479 2470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.976

MX W479 2471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.882

MX W479 2472 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.650

MX W479 2542 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.826

MX W479 2544 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 2545 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.629

MX W479 2546 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.769

MX W479 2547 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.656

MX W479 2548 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.679

MX W479 2549 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.853

MX W479 2550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2615 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 2616 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 2617 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2639 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 2640 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2641 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.777

MX W479 2643 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 2645 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479	2646	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	2660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	2663	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.896
MX W479	2664	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	2666	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	2669	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	2670	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.500
MX W479	2763	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.504
MX W479	2783	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.567
MX W479	2786	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.588
MX W479	2788	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.748
MX W479	2789	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	2832	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.501
MX W479	2833	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.506
MX W479	2900	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	2901	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.673
MX W479	2902	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.730
MX W479	2903	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	2905	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	2906	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753
MX W479	2907	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	3045	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.549
MX W479	3047	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.554
MX W479	3048	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	3148	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	3149	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	3168	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	3169	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	3170	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.601

MX W479 3171 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.796

MX W479 3172 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 3173 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.889

MX W479 3174 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 3239 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 3262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 3263 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 3289 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 3290 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 3291 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 3293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 3294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.672

MX W479 3313 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 3316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 3337 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 3338 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.521

MX W479 3339 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 3363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.584

MX W479 3364 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 3365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 3366 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 3382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 3383 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 3384 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.606

MX W479 3453 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 3454 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.711

MX W479 3457 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 3509 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.654

MX W479 3525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 3671 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.541

MX W479 3674 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 3693 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 3748 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.562

MX W479 3792 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.536

MX W479 3796 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 4029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.848

MX W479 4030 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.707

MX W479 4031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 4035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 4036 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.645

MX W479 4037 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 4057 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.502

MX W479 4080 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 4101 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.545

MX W479 4102 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 4103 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.847

MX W479 4104 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 4105 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 4172 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.682

MX W479 4173 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.824

MX W479 4227 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.565

MX W479 4297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 4298 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.590

MX W479 4301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 4493 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 4586 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 4629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.548

MX W479 4630 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479	4652	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.510
MX W479	4653	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.685
MX W479	4654	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	4656	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	4657	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.903
MX W479	4658	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.975
MX W479	4659	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.826
MX W479	4660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.741
MX W479	4661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.888
MX W479	4677	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.524
MX W479	4679	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	4680	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	4685	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.731
MX W479	4724	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	4996	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	5331	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.662
MX W479	5332	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561
MX W479	5471	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	5472	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	5475	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	5614	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.669
MX W479	5615	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.549
MX W479	5621	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.557
MX W479	5622	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.623
MX W479	5790	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.581
MX W479	5804	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	5805	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	5809	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	5812	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.675

MX W479 5813 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.645

MX W479 5814 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.523

MX W479 5979 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 5980 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 6120 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 6121 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 6125 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 6126 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 6142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 6146 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 6147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.573

MX W479 6148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.779

MX W479 6149 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.883

MX W479 6150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.860

MX W479 6267 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 6268 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 6271 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 6286 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 6292 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.577

MX W479 6294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.615

MX W479 6405 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 6406 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.887

MX W479 6407 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 6408 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.541

MX W479 6409 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 6410 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.740

MX W479 6411 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 6413 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.513

MX W479 6430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479	6431	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	6435	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.023
MX W479	6436	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	6486	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	6501	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.822
MX W479	6524	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.557
MX W479	6525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.600
MX W479	6526	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	6528	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.612
MX W479	6529	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	6530	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	6531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.662
MX W479	6532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.680
MX W479	6548	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.718
MX W479	6549	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.739
MX W479	6550	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.767
MX W479	6553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.592
MX W479	6554	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.776
MX W479	6555	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.581
MX W479	6556	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	6558	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.988
MX W479	6559	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.766
MX W479	6571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	6572	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.870
MX W479	6573	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.668
MX W479	6574	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.705
MX W479	6577	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.791
MX W479	6578	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	6579	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.622

MX W479	6580	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	6581	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.872
MX W479	6582	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.704
MX W479	6583	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	6596	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	6602	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	6791	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.545
MX W479	6835	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.564
MX W479	6836	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	6868	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	6870	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.516
MX W479	6890	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	6912	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.576
MX W479	6913	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	6914	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	6915	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	6917	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	6918	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	7014	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7099	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.534
MX W479	7100	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.759
MX W479	7101	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7103	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	7111	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	7123	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	7126	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.603
MX W479	7127	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	7129	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	7130	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.683

MX W479	7131	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	7132	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.525
MX W479	7195	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.554
MX W479	7196	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	7199	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	7207	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	7220	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.644
MX W479	7243	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.628
MX W479	7244	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.575
MX W479	7246	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.712
MX W479	7252	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.629
MX W479	7253	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	7255	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.681
MX W479	7316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.757
MX W479	7317	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.558
MX W479	7318	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.570
MX W479	7319	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	7321	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602
MX W479	7323	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	7324	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.578
MX W479	7326	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	7340	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.691
MX W479	7343	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.510
MX W479	7345	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	7346	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	7351	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	7363	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	7364	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.215
MX W479	7366	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.516

MX W479 7367 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.612

MX W479 7368 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.799

MX W479 7369 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.518

MX W479 7388 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 7389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 7390 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 7391 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.797

MX W479 7393 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7395 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 7396 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 7397 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 7399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.656

MX W479 7400 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.686

MX W479 7446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.641

MX W479 7462 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.761

MX W479 7468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 7469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.811

MX W479 7470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.856

MX W479 7471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.803

MX W479 7484 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 7513 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 7514 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 7531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.594

MX W479 7543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 7585 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.532

MX W479 7586 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.831

MX W479 7587 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.573

MX W479 7602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 7603 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479	7660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.708
MX W479	7661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7681	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	7682	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7683	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.707
MX W479	7684	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.628
MX W479	7753	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.641
MX W479	7755	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.502
MX W479	7794	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.607
MX W479	7796	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.032
MX W479	7797	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.212
MX W479	7798	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.800
MX W479	7801	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.637
MX W479	7802	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.906
MX W479	7803	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	7804	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	7805	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.048
MX W479	7806	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.021
MX W479	7807	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.755
MX W479	7819	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.902
MX W479	7867	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	7869	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	7873	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	7878	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	7879	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	7891	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	7892	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.532
MX W479	7894	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	7896	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556

MX W479	7897	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.506
MX W479	7898	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.761
MX W479	7899	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.773
MX W479	7900	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	7901	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.852
MX W479	7941	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	7948	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7989	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.671
MX W479	7990	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	7991	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	7992	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.622
MX W479	7993	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.288
MX W479	7994	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.608
MX W479	7996	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.606
MX W479	8011	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	8041	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.505
MX W479	8042	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	8062	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	8067	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	8086	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.668
MX W479	8087	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.504
MX W479	8088	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.618
MX W479	8089	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	8090	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.585
MX W479	8091	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	8107	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.613
MX W479	8108	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	8111	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.564
MX W479	8112	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.633

MX W479 8116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 8117 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.838

MX W479 8118 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 8119 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.001

MX W479 8120 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.649

MX W479 8190 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 8191 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 8192 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 8202 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.572

MX W479 8203 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.563

MX W479 8204 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.511

MX W479 8206 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 8208 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.642

MX W479 8209 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.717

MX W479 8210 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.670

MX W479 8211 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 8213 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.701

MX W479 8214 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.584

MX W479 8215 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.714

MX W479 8216 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.687

MX W479 8229 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 8230 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 8231 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 8235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 8238 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.571

MX W479 8301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.642

MX W479 8304 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 8306 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.685

MX W479 8307 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479	8311	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.550
MX W479	8350	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.596
MX W479	8356	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.511
MX W479	8358	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	8360	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	8427	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.593
MX W479	8428	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.548
MX W479	8442	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	8445	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	8447	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	8448	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	8450	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	8451	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.695
MX W479	8452	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.533
MX W479	8514	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	8553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.944
MX W479	8567	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.619
MX W479	8570	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.535
MX W479	8571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	8595	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626
MX W479	8646	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	8660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.567
MX W479	8730	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	8734	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	8735	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.560
MX W479	8760	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** MODEL SETUP OPTIONS SUMMARY ***

** Model Options Selected:

* Model Uses Regulatory DEFAULT Options
* Model Is Setup For Calculation of Average CONCentration Values.
* NO GAS DEPOSITION Data Provided.
* NO PARTICLE DEPOSITION Data Provided.
* Model Uses NO DRY DEPLETION. DDPLETE = F
* Model Uses NO WET DEPLETION. WETDPLT = F
* Stack-tip Downwash.
* Model Accounts for ELEVated Terrain Effects.
* Use Calms Processing Routine.
* Use Missing Data Processing Routine.
* No Exponential Decay.
* Model Uses RURAL Dispersion Only.
* BULKRN - Use BULKRN Delta-T and SolarRad option for SBL in AERMET
* Model Assumes No FLAGPOLE Receptor Heights.
* The User Specified a Pollutant Type of: TOLUENE

**Model Calculates 1 Short Term Average(s) of: 1-HR
and Calculates ANNUAL Averages

**This Run Includes: 1 Source(s); 1 Source Group(s); and 3106 Receptor(s)

with: 1 POINT(s), including

0 POINTCAP(s) and 0 POINTHOR(s)

and: 0 VOLUME source(s)

and: 0 AREA type source(s)

and: 0 LINE source(s)

and: 0 RLINE/RLINEXT source(s)

and: 0 OPENPIT source(s)

and: 0 BUOYANT LINE source(s) with a total of 0 line(s)

and: 0 SWPOINT source(s)

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 22112

**Output Options Selected:

Model Outputs Tables of ANNUAL Averages by Receptor

Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours

m for Missing Hours

b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1730.68 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0

Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07

Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 3.9 MB of RAM.

**Input Runstream File: C:\Users\jonahl\Antea USA, Inc\Connell Resources Inc-Connell - General\Air Modeling\BEEST Model\

**Output Print File: C:\Users\jonahl\Antea USA, Inc\Connell Resources Inc-Connell - General\Air Modeling\BEEST Model\

**File for Summary of Results: C:\Users\jonahl\Antea USA, Inc\Connell Resources Inc-Connell - General\Air Modeling\BEEST Model\

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***

(1=YES; 0=NO)

1 1 1

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***

(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** AERMOD - VERSION 22112 *** *** Title One *** 05/24/23

*** AERMET - VERSION 22112 *** *** *** 14:29:38

PAGE 3

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling
Met Version: 22112

Profile file: C:\Users\jonahl\OneDrive - Antea USA, Inc\Desktop\Modeling\Connell\BEEST Welling

Surface format: FREE

Profile format: FREE

Surface station no.: 0 Upper air station no.: 23062

Name: UNKNOWN Name: DENVER WSFO, CO

Year: 2006 Year: 2006

First 24 hours of scalar data

YR MO DY JDY HR H0 U* W* DT/DZ ZICNV ZIMCH M-O LEN Z0 BOWEN ALBEDO REF WS WD HT REF TA HT

- -

06 01 01 1 01 -26.0 0.162 -9.000 -9.000 -999. 157. 11.8 0.01 1.89 1.00 4.43 326. 10.0 280.1 2.0

06 01 01 1 02 -58.1 0.325 -9.000 -9.000 -999. 445. 42.5 0.01 1.89 1.00 6.57 310. 10.0 281.4
2.0

06 01 01 1 03 -33.0 0.292 -9.000 -9.000 -999. 380. 54.5 0.01 1.89 1.00 5.72 272. 10.0 281.0
2.0

06 01 01 1 04 -14.9 0.128 -9.000 -9.000 -999. 134. 10.2 0.01 1.89 1.00 3.67 320. 10.0 279.8
2.0

06 01 01 1 05 -13.5 0.124 -9.000 -9.000 -999. 105. 10.1 0.01 1.89 1.00 3.71 337. 10.0 279.0
2.0

06 01 01 1 06 -18.3 0.176 -9.000 -9.000 -999. 177. 21.3 0.01 1.89 1.00 4.29 344. 10.0 278.3
2.0

06 01 01 1 07 -34.9 0.286 -9.000 -9.000 -999. 367. 48.1 0.01 1.89 1.00 5.68 327. 10.0 279.3
2.0

06 01 01 1 08 -39.7 0.440 -9.000 -9.000 -999. 701. 154.4 0.01 1.89 1.00 7.96 307. 10.0 279.8
2.0

06 01 01 1 09 -17.3 0.580 -9.000 -9.000 -999. 1058. 810.0 0.01 1.89 0.43 10.10 287. 10.0 279.4
2.0

06 01 01 1 10 38.3 0.682 0.602 0.005 164. 1349. -597.0 0.01 1.89 0.31 11.67 301. 10.0 280.9
2.0

06 01 01 1 11 83.4 0.893 1.120 0.005 486. 2020. -616.6 0.01 1.89 0.26 15.29 291. 10.0 281.4
2.0

06 01 01 1 12 97.2 0.889 1.326 0.005 693. 2013. -521.8 0.01 1.89 0.24 15.20 293. 10.0 281.3
2.0

06 01 01 1 13 137.5 0.968 1.629 0.005 909. 2279. -476.9 0.01 1.89 0.24 16.54 291. 10.0
281.3 2.0

06 01 01 1 14 122.9 0.912 1.653 0.005 1063. 2100. -445.7 0.01 1.89 0.25 15.56 290. 10.0
281.0 2.0

06 01 01 1 15 67.7 0.795 1.385 0.005 1138. 1727. -536.6 0.01 1.89 0.30 13.59 295. 10.0
280.1 2.0

06 01 01 1 16 0.0 0.715 -9.000 -9.000 -999. 1464. 8888.0 0.01 1.89 0.41 12.34 301. 10.0 279.0
2.0

06 01 01 1 17 0.0 0.673 -9.000 -9.000 -999. 1330. 8888.0 0.01 1.89 0.72 11.62 304. 10.0 277.1
2.0

06 01 01 1 18 0.0 0.546 -9.000 -9.000 -999. 987. 8888.0 0.01 1.89 1.00 9.43 293. 10.0 275.9
2.0

06 01 01 1 19 -46.9 0.630 -9.000 -9.000 -999. 1199. 388.5 0.01 1.89 1.00 11.09 294. 10.0 276.2
2.0

06 01 01 1 20 -49.7 0.337 -9.000 -9.000 -999. 566. 55.9 0.01 1.89 1.00 6.57 310. 10.0 275.6
2.0

06 01 01 1 21 -29.5 0.194 -9.000 -9.000 -999. 235. 17.9 0.01 1.89 1.00 4.69 313. 10.0 274.4
2.0

06 01 01 1 22 -29.9 0.238 -9.000 -9.000 -999. 279. 32.8 0.01 1.89 1.00 5.32 338. 10.0 275.8
2.0

06 01 01 1 23 -15.8 0.134 -9.000 -9.000 -999. 123. 11.1 0.01 1.89 1.00 3.67 241. 10.0 274.5
2.0

06 01 01 1 24 -19.1 0.117 -9.000 -9.000 -999. 96. 6.1 0.01 1.89 1.00 3.98 279. 10.0 273.6
2.0

First hour of profile data

YR MO DY HR HEIGHT F WDIR WSPD AMB_TMP sigmaA sigmaW sigmaV

06 01 01 01 2.0 0 -999. -99.00 280.1 99.0 -99.00 -99.00

06 01 01 01 10.0 0 326. 4.43 282.0 5.4 -99.00 0.42

06 01 01 01 60.0 1 316. 5.10 283.1 6.1 -99.00 0.54

F indicates top of profile (=1) or below (=0)

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF TOLUENE IN MICROGRAMS/M**3 **

NETWORK

GROUP ID AVERAGE CONC RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

- -

ALL 1ST HIGHEST VALUE IS 0.00543 AT (499450.00, 4508500.00, 1603.57, 1603.57, 0.00) DC

2ND HIGHEST VALUE IS 0.00531 AT (499450.00, 4508450.00, 1603.33, 1603.33, 0.00) DC

3RD HIGHEST VALUE IS 0.00527 AT (499700.00, 4508150.00, 1610.72, 1610.72, 0.00) DC

4TH HIGHEST VALUE IS 0.00517 AT (499450.00, 4508550.00, 1603.86, 1603.86, 0.00) DC

5TH HIGHEST VALUE IS 0.00512 AT (499750.00, 4508100.00, 1608.86, 1608.86, 0.00) DC

6TH HIGHEST VALUE IS 0.00505 AT (499750.00, 4508150.00, 1610.15, 1610.15, 0.00) DC

7TH HIGHEST VALUE IS 0.00502 AT (499700.00, 4508100.00, 1609.85, 1609.85, 0.00) DC

8TH HIGHEST VALUE IS 0.00500 AT (499400.00, 4508500.00, 1603.34, 1603.34, 0.00) DC

9TH HIGHEST VALUE IS 0.00497 AT (499800.00, 4508100.00, 1606.47, 1606.47, 0.00) DC

10TH HIGHEST VALUE IS 0.00489 AT (499400.00, 4508550.00, 1603.60, 1603.60, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF TOLUENE IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	NETWORK RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

ALL HIGH 1ST HIGH VALUE IS 0.37369 ON 06102824: AT (499600.00, 4508200.00, 1608.71, 1608.71, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV NODRYDPLT NOWETDPLT RURAL BULKRN SigA Data

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)

A Total of 624 Warning Message(s)

A Total of 142 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 1 Calm Hours Identified

A Total of 141 Missing Hours Identified (1.61 Percent)

******** FATAL ERROR MESSAGES ********

*** NONE ***

******** WARNING MESSAGES ********

ME W181 3169 MEOPEN: BULKRN Delta-T & SolarRad option for SBL was used in AERMET

MX W403 3169 PFLCNV: Turbulence data is being used w/o ADJ_U* option SigA Data

MX W479 24 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 29 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.668

MX W479 30 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 31 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.712

MX W479 48 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 51 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.546

MX W479 52 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 53 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 116 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 141 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 142 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 143 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.877

MX W479 147 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.581

MX W479 148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 150 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 151 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 215 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 216 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 221 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 222 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.588

MX W479 244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 291 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.544

MX W479 296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 308 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.572

MX W479 312 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 313 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.700

MX W479 314 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 317 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.795

MX W479 318 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 320 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.664

MX W479 321 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 340 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.599

MX W479 342 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 475 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.580

MX W479 479 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 482 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.746

MX W479 483 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 484 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 486 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 487 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.681

MX W479 488 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.697

MX W479 489 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.921

MX W479 509 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 524 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.527

MX W479 525 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 526 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 527 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 528 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.926

MX W479 529 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.676

MX W479 530 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.808

MX W479 531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.740

MX W479 532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.537

MX W479 533 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.621

MX W479 534 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.830

MX W479 535 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 554 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 555 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.719

MX W479 556 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 573 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.536

MX W479 574 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.241

MX W479 575 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.721

MX W479 576 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.562

MX W479 577 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 578 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.213

MX W479 579 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 580 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 581 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.713

MX W479 582 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.678

MX W479 583 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.869

MX W479 584 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 595 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.603

MX W479 597 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.667

MX W479 599 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.596

MX W479 600 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 601 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.705

MX W479 605 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.535

MX W479 629 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.665

MX W479 632 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.505

MX W479 724 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.529

MX W479 725 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 727 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 775 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 822 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 835 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 836 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.517

MX W479 837 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.503

MX W479 838 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 839 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.607

MX W479 932 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.608

MX W479 941 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.557

MX W479 1029 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.735

MX W479 1031 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.587

MX W479 1034 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.539

MX W479 1035 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.595

MX W479 1051 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 1052 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 1053 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.884

MX W479 1054 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.859

MX W479	1055	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.766
MX W479	1056	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.677
MX W479	1060	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	1061	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.639
MX W479	1197	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	1198	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.709
MX W479	1199	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	1200	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.530
MX W479	1201	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.663
MX W479	1202	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.650
MX W479	1203	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.590
MX W479	1204	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.726
MX W479	1205	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.750
MX W479	1206	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.700
MX W479	1208	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	1218	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	1219	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.824
MX W479	1220	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	1221	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.731
MX W479	1222	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	1223	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	1224	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	1225	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	1226	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753
MX W479	1227	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	1228	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	1229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602
MX W479	1230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	1231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.753

MX W479 1243 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 1244 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 1245 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.522

MX W479 1276 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 1277 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.555

MX W479 1278 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.729

MX W479 1293 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.683

MX W479 1294 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.851

MX W479 1295 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 1296 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.611

MX W479 1297 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.576

MX W479 1300 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 1301 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.723

MX W479 1302 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479 1303 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.516

MX W479 1316 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.692

MX W479 1343 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 1344 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.720

MX W479 1345 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.658

MX W479 1346 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 1347 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.663

MX W479 1348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.604

MX W479 1363 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 1365 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.696

MX W479 1373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.592

MX W479 1374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1375 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.644

MX W479 1389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.622

MX W479 1392 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.556

MX W479 1394 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.577

MX W479 1395 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.538

MX W479 1396 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 1397 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 1441 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 1442 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1483 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 1532 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 1537 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 1539 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.613

MX W479 1540 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.597

MX W479 1541 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 1543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 1566 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 1661 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 1989 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 1990 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 1991 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.509

MX W479 1993 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.563

MX W479 1994 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.534

MX W479 2086 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 2088 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.531

MX W479 2089 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 2093 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 2228 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.579

MX W479 2229 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.638

MX W479 2230 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.693

MX W479 2231 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.634

MX W479 2232 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.632

MX W479 2234 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.552

MX W479 2235 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.736

MX W479 2253 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 2254 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.510

MX W479 2255 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.755

MX W479 2262 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.806

MX W479 2348 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.575

MX W479 2349 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2350 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.690

MX W479 2351 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2352 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.834

MX W479 2353 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.525

MX W479 2354 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2355 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.560

MX W479 2356 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.633

MX W479 2373 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.752

MX W479 2374 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.569

MX W479 2378 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.519

MX W479 2379 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.647

MX W479 2380 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.671

MX W479 2382 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.698

MX W479 2399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.920

MX W479 2421 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2422 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.727

MX W479 2424 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.582

MX W479 2425 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.684

MX W479 2428 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 2429 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.578

MX W479 2430 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.528

MX W479 2445 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2447 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.779

MX W479 2448 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.743

MX W479 2449 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.733

MX W479 2450 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.520

MX W479 2468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.568

MX W479 2469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=1.019

MX W479 2470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.976

MX W479 2471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.882

MX W479 2472 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.650

MX W479 2542 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.620

MX W479 2543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.826

MX W479 2544 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.734

MX W479 2545 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.629

MX W479 2546 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.769

MX W479 2547 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.656

MX W479 2548 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.679

MX W479 2549 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.853

MX W479 2550 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2615 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 2616 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.515

MX W479 2617 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.614

MX W479 2639 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.507

MX W479 2640 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.715

MX W479 2641 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.777

MX W479 2643 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.648

MX W479 2645 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.602

MX W479 2646 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.710

MX W479 2660 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.547

MX W479 2663 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.896

MX W479 2664 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 2666 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.543

MX W479 2669 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.728

MX W479 2670 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.500

MX W479 2763 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.504

MX W479 2783 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.567

MX W479 2786 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.588

MX W479 2788 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.748

MX W479 2789 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.526

MX W479 2832 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.501

MX W479 2833 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.506

MX W479 2900 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.635

MX W479 2901 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.673

MX W479 2902 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.730

MX W479 2903 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.617

MX W479 2905 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.672

MX W479 2906 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.753

MX W479 2907 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.574

MX W479 3045 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.549

MX W479 3047 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.554

MX W479 3048 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.508

MX W479 3148 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.666

MX W479 3149 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.542

MX W479 3168 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 3169 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 3170 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.601

MX W479	3171	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.796
MX W479	3172	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	3173	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.889
MX W479	3174	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.658
MX W479	3239	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	3262	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.633
MX W479	3263	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	3289	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.546
MX W479	3290	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.586
MX W479	3291	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.607
MX W479	3293	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	3294	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	3313	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	3316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.595
MX W479	3337	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.519
MX W479	3338	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.521
MX W479	3339	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	3363	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.584
MX W479	3364	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	3365	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	3366	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.576
MX W479	3382	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.620
MX W479	3383	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.727
MX W479	3384	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.606
MX W479	3453	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.648
MX W479	3454	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.711
MX W479	3457	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	3509	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.654
MX W479	3525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.614

MX W479	3671	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.541
MX W479	3674	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	3693	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	3748	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.562
MX W479	3792	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.536
MX W479	3796	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.568
MX W479	4029	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.848
MX W479	4030	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.707
MX W479	4031	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.721
MX W479	4035	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.520
MX W479	4036	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	4037	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	4057	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.502
MX W479	4080	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	4101	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.545
MX W479	4102	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.715
MX W479	4103	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.847
MX W479	4104	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.608
MX W479	4105	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	4172	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.682
MX W479	4173	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.824
MX W479	4227	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	4297	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.508
MX W479	4298	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.590
MX W479	4301	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.582
MX W479	4493	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.603
MX W479	4586	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	4629	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.548
MX W479	4630	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.517

MX W479	4652	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.510
MX W479	4653	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.685
MX W479	4654	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	4656	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.599
MX W479	4657	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.903
MX W479	4658	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.975
MX W479	4659	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.826
MX W479	4660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.741
MX W479	4661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.888
MX W479	4677	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.524
MX W479	4679	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	4680	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	4685	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.731
MX W479	4724	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	4996	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	5331	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.662
MX W479	5332	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.561
MX W479	5471	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	5472	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	5475	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	5614	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.669
MX W479	5615	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.549
MX W479	5621	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.557
MX W479	5622	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.623
MX W479	5790	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.581
MX W479	5804	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	5805	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	5809	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.553
MX W479	5812	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.675

MX W479	5813	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.645
MX W479	5814	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	5979	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	5980	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.546
MX W479	6120	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	6121	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.501
MX W479	6125	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	6126	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	6142	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	6146	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.582
MX W479	6147	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.573
MX W479	6148	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.779
MX W479	6149	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.883
MX W479	6150	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.860
MX W479	6267	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.540
MX W479	6268	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	6271	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.529
MX W479	6286	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.595
MX W479	6292	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.577
MX W479	6294	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.615
MX W479	6405	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.611
MX W479	6406	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.887
MX W479	6407	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	6408	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.541
MX W479	6409	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	6410	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.740
MX W479	6411	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.616
MX W479	6413	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	6430	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.587

MX W479	6431	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	6435	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.023
MX W479	6436	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.778
MX W479	6486	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	6501	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.822
MX W479	6524	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.557
MX W479	6525	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.600
MX W479	6526	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	6528	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.612
MX W479	6529	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	6530	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	6531	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.662
MX W479	6532	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.680
MX W479	6548	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.718
MX W479	6549	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.739
MX W479	6550	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.767
MX W479	6553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.592
MX W479	6554	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.776
MX W479	6555	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.581
MX W479	6556	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	6558	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.988
MX W479	6559	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.766
MX W479	6571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	6572	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.870
MX W479	6573	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.668
MX W479	6574	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.705
MX W479	6577	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.791
MX W479	6578	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	6579	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.622

MX W479	6580	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	6581	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.872
MX W479	6582	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.704
MX W479	6583	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.559
MX W479	6596	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	6602	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.684
MX W479	6791	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.545
MX W479	6835	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.564
MX W479	6836	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	6868	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	6870	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.516
MX W479	6890	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	6912	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.576
MX W479	6913	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.636
MX W479	6914	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	6915	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	6917	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	6918	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	7014	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7099	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.534
MX W479	7100	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.759
MX W479	7101	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7103	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	7111	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.515
MX W479	7123	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	7126	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.603
MX W479	7127	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	7129	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	7130	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.683

MX W479	7131	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	7132	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.525
MX W479	7195	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.554
MX W479	7196	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	7199	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	7207	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.635
MX W479	7220	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.644
MX W479	7243	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.628
MX W479	7244	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.575
MX W479	7246	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.712
MX W479	7252	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.629
MX W479	7253	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.710
MX W479	7255	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.681
MX W479	7316	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.757
MX W479	7317	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.558
MX W479	7318	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.570
MX W479	7319	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	7321	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.602
MX W479	7323	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556
MX W479	7324	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.578
MX W479	7326	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.528
MX W479	7340	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.691
MX W479	7343	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.510
MX W479	7345	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	7346	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.565
MX W479	7351	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.538
MX W479	7363	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	7364	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.215
MX W479	7366	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.516

MX W479 7367 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.612

MX W479 7368 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.799

MX W479 7369 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.518

MX W479 7388 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.589

MX W479 7389 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.553

MX W479 7390 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.725

MX W479 7391 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.797

MX W479 7393 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.643

MX W479 7395 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.616

MX W479 7396 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 7397 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.559

MX W479 7399 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.656

MX W479 7400 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.686

MX W479 7446 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.641

MX W479 7462 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.761

MX W479 7468 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.636

MX W479 7469 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.811

MX W479 7470 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.856

MX W479 7471 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.803

MX W479 7484 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.540

MX W479 7513 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.558

MX W479 7514 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.585

MX W479 7531 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.594

MX W479 7543 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.512

MX W479 7585 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.532

MX W479 7586 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.831

MX W479 7587 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.573

MX W479 7602 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.586

MX W479 7603 TGINIT: Potential temperature gradient is out-of-range: TG4PFL=0.561

MX W479	7660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.708
MX W479	7661	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7681	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574
MX W479	7682	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	7683	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.707
MX W479	7684	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.628
MX W479	7753	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.641
MX W479	7755	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.502
MX W479	7794	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.607
MX W479	7796	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.032
MX W479	7797	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.212
MX W479	7798	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.800
MX W479	7801	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.637
MX W479	7802	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.906
MX W479	7803	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	7804	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.841
MX W479	7805	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.048
MX W479	7806	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.021
MX W479	7807	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.755
MX W479	7819	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.902
MX W479	7867	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	7869	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	7873	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	7878	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.513
MX W479	7879	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	7891	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.666
MX W479	7892	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.532
MX W479	7894	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.509
MX W479	7896	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.556

MX W479	7897	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.506
MX W479	7898	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.761
MX W479	7899	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.773
MX W479	7900	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	7901	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.852
MX W479	7941	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	7948	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.503
MX W479	7989	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.671
MX W479	7990	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	7991	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.627
MX W479	7992	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.622
MX W479	7993	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.288
MX W479	7994	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.608
MX W479	7996	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.606
MX W479	8011	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.552
MX W479	8041	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.505
MX W479	8042	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.604
MX W479	8062	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.522
MX W479	8067	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.589
MX W479	8086	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.668
MX W479	8087	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.504
MX W479	8088	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.618
MX W479	8089	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.531
MX W479	8090	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.585
MX W479	8091	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.523
MX W479	8107	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.613
MX W479	8108	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.690
MX W479	8111	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.564
MX W479	8112	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.633

MX W479	8116	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	8117	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.838
MX W479	8118	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.725
MX W479	8119	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=1.001
MX W479	8120	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.649
MX W479	8190	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	8191	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.719
MX W479	8192	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.617
MX W479	8202	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.572
MX W479	8203	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.563
MX W479	8204	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.511
MX W479	8206	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.527
MX W479	8208	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.642
MX W479	8209	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.717
MX W479	8210	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.670
MX W479	8211	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.664
MX W479	8213	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.701
MX W479	8214	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.584
MX W479	8215	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.714
MX W479	8216	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.687
MX W479	8229	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.638
MX W479	8230	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.543
MX W479	8231	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.539
MX W479	8235	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.507
MX W479	8238	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.571
MX W479	8301	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.642
MX W479	8304	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.555
MX W479	8306	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.685
MX W479	8307	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.574

MX W479	8311	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.550
MX W479	8350	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.596
MX W479	8356	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.511
MX W479	8358	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.547
MX W479	8360	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.512
MX W479	8427	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.593
MX W479	8428	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.548
MX W479	8442	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.566
MX W479	8445	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.526
MX W479	8447	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.643
MX W479	8448	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.591
MX W479	8450	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.583
MX W479	8451	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.695
MX W479	8452	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.533
MX W479	8514	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.597
MX W479	8553	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.944
MX W479	8567	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.619
MX W479	8570	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.535
MX W479	8571	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.544
MX W479	8595	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626
MX W479	8646	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.542
MX W479	8660	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.567
MX W479	8730	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.728
MX W479	8734	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.672
MX W479	8735	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.560
MX W479	8760	TGINIT: Potential temperature gradient is out-of-range:	TG4PFL=0.626

DELICH ASSOCIATES Traffic & Transportation Engineering
2272 Glen Haven Drive Loveland, Colorado 80538
Phone: (970) 669-2061 Fax: (970) 669-5034

MEMORANDUM

TO: Dan Egger, Ditesco Services
Larimer County Engineering
Tim Bilobran, CDOT Region 4
Town of Wellington

FROM: Matt Delich

DATE: March 3, 2023

SUBJECT: Connell Asphalt Batch Plant Transportation Impact Study (TIS) – Response to comments (File: 2216ME01)

This memorandum addresses the staff comments from Larimer County and CDOT regarding the "Connell Asphalt Batch Plant Transportation Impact Study," dated October 2022.

Larimer County had comments regarding the use of Town of Wellington criteria for the streets and intersections. Larimer County requested that criteria from the Larimer County Rural Roadway Standards be used for determining auxiliary lanes at intersections. In particular, the Larimer County Road 7 (LCR7)/Larimer County Road 66 (LCR66) intersection. The Town of Wellington uses the criteria contained in the Standard Design Criteria and Standard Construction Requirements (SDCSCR), Town of Wellington. Typically, when producing a TIS for a site within a municipality's growth management area, the study is scoped with that municipality and the municipality's criteria is used. The proposed Connell Asphalt Batch Plant site is within the Town of Wellington's growth management area. Therefore, the TIS was scoped with the Town of Wellington (August 12, 2022) and Wellington criteria was used. In order to address Larimer County comments, this memorandum will state the requirements using the Larimer County Rural Roadway Standards and using SDCSCR.

The Larimer County Rural Roadway Standards generally uses the Colorado State Highway Access Code (SHAC) criteria for auxiliary lanes at intersections. For analysis purposes, LCR7 is assumed to be evaluated as a Non-Rural Arterial (NR-B) roadway. Based upon the SHAC, with a NR-B category and a posted speed of greater than 40 mph, a left-turn deceleration lane is required at an intersection with a projected peak hour ingress turning volume greater than 10 vehicles per hour (vph) and a right-turn deceleration lane is required at an intersection with a projected peak hour ingress turning volume greater than 25 vph. Acceleration lanes are generally not required. Left-turn and right-turn deceleration lanes should provide only the deceleration length. In the short range (2025) future, left-turn deceleration lanes would not be required at the LCR7/LCR66 intersection. A southbound

right-turn lane deceleration would be required. In the long range (2045) future, a northbound left-turn deceleration lane would be required at the LCR7/LCR66 intersection. A southbound left-turn deceleration lane does not meet the criteria. A southbound right-turn lane deceleration would be required. It is important to note that in Section 3.5 of the SHAC, a right-turn deceleration lane may be dropped if the 20th year volume in the in the travel lane is predicted to be below 150 vehicles per hour (vph). In the long range (2045) future, the forecasted southbound volume at the LCR7/LCR66 intersection is 125 vph or less. Therefore, until greater growth is forecasted on LCR7, the southbound right-turn deceleration lane can be waived.

Auxiliary turn lane requirements are based on the Town of Wellington Standard Design Criteria and Standard Construction Requirements. As arterial streets, LCR7 and LCR66 are supposed to have left-turn deceleration lanes at all intersections. However, since this area of Wellington is fairly rural, LCR7 and LCR66 are not expected to be reconstructed to the full arterial street standards until other significant development occurs. Using Volume Warrants for Left-turn Lanes at Unsignalized Intersections, left-turn deceleration lanes would not be required in the short range (2025) or long range (2045) futures. Using Traffic Volume Guidelines for Design Right-turn Lanes, a southbound right-turn deceleration lane would not be required in the short range (2025) future at the LCR7/LCR66 intersection. In the long range (2045) future, a southbound right-turn deceleration lane would be at the threshold of requiring the lane in the afternoon peak hour.

It is our understanding that Connell Resources will pave/construct LCR66 along the frontage of the property to the LCR7/LCR66 intersection. This cross section will include five foot bicycle lanes.

Tim Bilobran, CDOT Region 4 requested an inventory of the acceleration and deceleration geometry at the I-25/Owl Canyon interchange. The State Highway Access Code has acceleration and deceleration criteria up to 70 mph. It was agreed to use the acceleration and deceleration criteria in A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018, AASHTO (10.9.6.4.7 – 10.9.6.6.2). For analysis purposes, the criteria used assumed a flat grade of less than three percent, even though the on-ramps and off-ramps have upgrades and downgrades. This will result in a conservative analysis, since the ramp upgrades would aid in deceleration and the ramp downgrades would aid in acceleration. This analysis also assumed a stop condition at the top of the ramps. The various lane lengths were scaled from aerial photographs of the I-25/Owl Canyon interchange.

For acceleration lanes from a stop condition to 75 mph, the cited reference states that the acceleration lane should be 1790 feet. The cited reference also states that a taper length of 300 feet is adequate for speeds up to 75 mph. The SHAC suggests a taper of 25:1 (300 feet) for all speeds greater than 60 mph. The taper length applies to both acceleration and deceleration. For 75 mph, the total is 2090 feet (1790' + 300'). At the I-25/Owl Canyon interchange, the existing acceleration lane length for the southbound on-ramp is approximately 1670 feet, with a taper length of approximately 300 feet (total 1970

feet). This existing acceleration lane is approximately 120 feet shorter than the cited criteria. For the northbound on-ramp, the existing acceleration lane length is approximately 2000 feet, with a taper length of approximately 400 feet (total 2400 feet). This existing acceleration lane is approximately 310 feet longer than the cited criteria.

For deceleration lanes from 75 mph to a stop condition, the cited reference states that the deceleration lane should be 660 feet. The total length (plus taper at 300 feet) would be 960 feet. At the I-25/Owl Canyon interchange, the existing deceleration lane length for the southbound off-ramp is approximately 1480 feet, with a taper length of approximately 370 feet (total 1850 feet). This existing deceleration lane is approximately 890 feet longer than the recommended 960 feet. For the northbound off-ramp, the existing deceleration lane length is approximately 1640 feet, with a taper length of approximately 330 feet (total 1970 feet). This existing deceleration lane is approximately 1010 feet longer than the recommended 960 feet.

The foregoing memorandum addresses comments from Larimer County and CDOT regarding the, “Connell Asphalt Batch Plant Transportation Impact Study.” If there are any additional questions or comments, do not hesitate to contact us.

Connell Batch Plant - Comment Response Log			
CDOT (File Name: CDOT--Email_Comments)			
No.	Page	Comment	Response
1		Have the applicant's traffic engineer state whether the acceleration lanes onto I-25 (especially southbound) are up to the full Access code standards since this is predominantly a heavily-laden truck traffic generator	The TIS has been amended with a memorandum to address the CDOT concerns
Larimer County Engineering (File Name: LC_Wellington Referral - Connell Resources Site Plan)			
No.	Page	Comment	Response
TIS Review			
1		The Traffic Impact Study (TIS), included with this application has been conducted utilizing the Town of Wellington's Standard Design Criteria and Standard Construction Requirements. Larimer County will require that the TIS be revised to follow the Criteria shown in Appendix F of the Larimer County Rural Area Roadway Standards (LCRARS) as most offsite intersections impacted by this development fall within the unincorporated area.	The TIS has been amended with a memorandum to address the concerns of the County review and clarify assumptions used
2		Trip distribution – Clarification on finished product (Where is it going?). Are we to assume that all trips hauling the finished product to and from the site are to head east via CR66, proceed north on CR7, west along CR70, and then exit the County's roadway system onto I-25?	Primary truck traffic will be routed along CR 70, south on CR 7, and west on CR 66 to the site. Standard practice will not route truck traffic to the west on CR 66
3		How will these haul routes be enforced? Are specific conditions of approval being proposed?	Haul routes are designated by Connell batch plant personnel
4		The trip generation appears low for a plant of this capacity, how were these numbers determined?	Trip generation is based on current plant operations
5		Are the peak numbers averaged over the entire year or are they representative of peak season?	Peak numbers are representative of the summer season
6		Were bicyclists considered in the evaluation of the proposed haul routes? CR70→CR7→CR66→CR9 is a frequented route for cyclists. We have significant concerns for the safety of cyclists with an increase in heavy truck traffic of this magnitude.	Per discussions, the proposed 2' gravel shoulder will instead be paved to create a 4' wide paved shoulder/bike lane will be installed along CR66
7		Larimer County will require that the following intersections be evaluated using LCRARS Appendix F criteria: (CR70&CR7, CR66&CR7, CR66&CR9, CR66&Site Access, CR9&62E, CR9&HWY1)	The CR66/CR7 intersection has been evaluated in more detail and updated as part of the memorandum. Additional intersections will not be evaluated
8		CDOT should also be made aware of this project as it may have implications on their planned HWY 1 realignment at CR9 and CR62E.	CDOT was a reference agency and has provided comments on the project
Adjacent and/or Offsite Roadway Improvements			
9		Larimer County's Land Use Code Article 4 requirements specific to Adequate Public Facilities require that roadway segments that experience vehicular traffic volumes in excess of 400- trips/day be paved. The existing plus proposed traffic volumes for CR66 exceed this threshold. Paving will be required for the segment of CR66 from the current town limits (west of Boxelder Creek) to CR7. The paved roadway section will need to consist of a 28-ft paved surface to accommodate a minimum of two 12-ft lanes and two 2-ft shoulders. It is strongly recommended that this section be carried through to CR7.	Truck traffic will not be routed west to CR9. Per discussions, asphalt pavement will not extend to the west beyond the current limits shown on the drawings
10		Additional considerations will need to be given for cyclists along CR66. Shoulders wider than the required 2-ft may be needed to provide a safe corridor for cyclists adjacent to heavy haul trucks.	Per discussions, the proposed 2' gravel shoulder will instead be paved to create a 4' wide paved shoulder/bike lane will be installed along CR66
11		The existing railroad crossing will need to be updated. It appears that this issue is already being considered.	The applicant's proposed work is outside the RR ROW and will not update the roadway within the RR ROW. However, BNSF plans to update the crossing and the applicant design will accommodate these updates
12		Under the current criteria, the TIS states that a northbound right-turn lane approaching the LCR70/LCR7 intersection will be required in the short-range projections, and a southbound right-turn lane approaching the LCR7/LCR66 intersection will be required in the long range (2045) projections. Improvements required by either short-range or long-range projections are to be completed at the time of development. Expectations for long term build out by others is not acceptable.	The CR66/CR7 intersection has been evaluated in more detail and updated as part of the memorandum.
13		Depending on the requested revisions to the TIS, offsite improvements may be required at several of the intersections highlighted previously.	Additional off-site improvements are not anticipated.

Note 1: The comment response log includes comments related to the construction drawings for the proposed site. As part of the site plan submittal, the Applicant has removed the bulk of the construction drawings and has submitted drawings that are pertinent to the site plan approval. Following approval of the site plan by the Planning Commission, the Applicant will complete the construction drawings and drainage report and will address these additional comments at that time.

DELICH ASSOCIATES Traffic & Transportation Engineering
2272 Glen Haven Drive Loveland, Colorado 80538
Phone: (970) 669-2061 Fax: (970) 669-5034

MEMORANDUM

TO: Jill Burrell/Dan Egger, Ditesco
John Warren, Connell Resources
Town of Wellington Staff
Sean Kellar, Kellar Engineering

FROM: Matt Delich

DATE: November 3, 2022

SUBJECT: Connell Asphalt Batch Plant Transportation Impact Study – Response to Comments (File: 2216ME01)

This memorandum responds to comments regarding the ***Connell Asphalt Batch Plant Transportation Impact Study*** (TIS) dated October 2022. The comments from Sean Kellar, Wellington Traffic Consultant are attached. A memorandum addressing the comments was requested. A revised TIS was deemed not to be necessary.

Each comment is addressed below.

Comment 1 – Acknowledged.

Comment 2 – Acknowledged.

Comment 3 – There is a single track railroad crossing on CR66, located approximately 1200 feet to the east of the site access driveway. According to Wellington staff, there are six trains per day on this track. The current control at this railroad crossing is overhead flashing-light signals. County Road 66 increases in grade to the east, cresting approximately 225 feet east of the railroad tracks. The railroad crossing is fully visible by traffic in the eastbound direction for more than 1500 feet. For traffic approaching in the westbound direction, the overhead flashing-light signal is visible at a location approximately 475 feet east of the railroad crossing. The stopping sight distance (at a design speed of 45 mph [5 mph greater than the posted speed of 40 mph]) is 360 feet. This is considerably less than the available 475 feet. This segment of CR66 will be paved and the crest will be lowered by 2 feet. Therefore, the stopping sight distance will be more than the already satisfactory stopping sight distance described above. The BNSF Railroad plans to install crossing arms, which will further improve the safety at this crossing. It is concluded that the railroad crossing is safe.

Comment 4 – The project will pave CR66 from the west property line to CR7.

Comment 5 – Acknowledged.

The foregoing provides responses to Wellington Traffic Consultant comments. Do not hesitate to contact me if there are questions or if additional information is required.

KELLAR ENGINEERING

October 19, 2022

Connell Asphalt Batch Plant, Wellington Traffic Impact Study (TIS) Review Comments:

1. Kellar Engineering (KE) has reviewed the submitted Connell Asphalt Batch Plant Traffic Impact Study (TIS). Thank you for providing this information to review. The submitted TIS generally follows industry standard methods.

2. The level of service (LOS) analysis in the TIS appears appropriate and all study intersections and the proposed site access appears to meet the Town's intersection LOS standards.

3. The safety with the railroad crossing and added traffic on CR 66 should be addressed in the TIS. While it appears that sufficient spacing exists between the site access and railroad crossing, please provide more information in the narrative of the TIS explaining how this was accounted for.

4. The project is proposing to add 254 ADT to CR 66. CR 66 is currently unpaved west of CR 7. Adding heavy truck traffic to CR 66 could result in the need for future maintenance of this unpaved portion of CR 7. It is recommended that the Connell Asphalt Batch plant agrees to work with the Town to ensure that the condition of CR 66 continues to be in an acceptable, well-maintained condition per the discretion of the Town of Wellington.

5. KE concurs with the findings in the TIS that with the addition of the Connell Asphalt Batch Plant site generated traffic, a northbound right-turn lane will be required approaching the Own Canyon Road (CR 70)/CR 7 intersection.

If you have any questions, please do not hesitate to contact me at (970) 219-1602 or skellar@kellarengineering.com.

Respectfully,

Kellar Engineering LLC

Sean K. Kellar, PE, PTOE
Colorado PE #38650

CONNELL ASPHALT BATCH PLANT
TRANSPORTATION IMPACT STUDY

WELLINGTON, COLORADO

OCTOBER 2022

Prepared for:

Ditesco, LLC
2133 South Timberline Road, Suite 110
Fort Collins, CO 80525

Prepared by:

DELICH ASSOCIATES
2272 Glen Haven Drive
Loveland, CO 80538
Phone: 970-669-2061
FAX: 970-669-5034

Project # 2216

TABLE OF CONTENTS

I. INTRODUCTION 1

II. EXISTING CONDITIONS 2
Land Use 2
Streets 2
Existing Traffic 5
Existing Operation 5
Pederstrian/Bicycle Facilities 5

III. PROPOSED DEVELOPMENT 8
Trip Generation 8
Trip Distribution 10
Background Traffic Projections 10
Trip Assignment/Total Traffic 10
Signal Warrants 10
Geometry 10
Operation Analysis 17
Pedestrian/Bicycle Facilities 17

IV. CONCLUSIONS 21

LIST OF TABLES

1. Current Peak Hour Operation 7
2. Trip Generation 8
3. Short Range (2025) Background Peak Hour Operation 19
4. Long Range (2045) Background Peak Hour Operation 19
5. Short Range (2025) Total Peak Hour Operation 20
6. Long Range (2045) Total Peak Hour Operation 20

LIST OF FIGURES

1. Site Location 3
2. Existing Geometry 4
3. Recent Peak Hour Traffic 6
4. Site Plan 9
5. Short Range (2025) Background Peak Hour Traffic 11
6. Long Range (2045) Background Peak Hour Traffic 12
7. Site Generated Peak Hour Traffic 13
8. Short Range (2025) Total Peak Hour Traffic 14
9. Long Range (2045) Total Peak Hour Traffic 15
10. Short Range (2025) Geometry 16
11. Long Range (2045) Geometry 18

APPENDICES

A. Base Assumptions Form
B. Peak Hour Traffic Counts
C. Current Peak Hour Operation/Level of Service Descriptions/Wellington Motor Vehicle LOS Standards (Intersections)
D. Short Range (2025) Background Peak Hour Operation
E. Long Range (2045) Background Peak Hour Operation
F. Short Range (2025) Total Peak Hour Operation
G. Long Range (2045) Total Peak Hour Operation

I. INTRODUCTION

This transportation impact study (TIS) addresses the capacity, geometric, and control requirements at and near the proposed Connell Asphalt Batch Plant project. The proposed Connell Asphalt Batch Plant site is located south of (adjacent to) Larimer County Road 66 (LCR66) and west of Larimer County Road 7 (LCR7) in Wellington, Colorado.

During the course of the analysis, numerous contacts were made with the project owners (Connell Resources, Inc.), the project engineer (Ditesco, LLC), and the Town of Wellington staff. The Transportation Impact Study Base Assumptions form and related documents are provided in Appendix A. Due to the trip generation, this is a full transportation impact study. The study involved the following steps:

- Collect physical, traffic, and development data;
- Perform trip generation, trip distribution, and trip assignment;
- Determine peak hour traffic volumes;
- Conduct capacity and operational level of service analyses on key intersections;
- Analyze signal warrants;
- Conduct level of service evaluation of pedestrian, bicycle, and transit modes of transportation

II. EXISTING CONDITIONS

The location of the Connell Asphalt Batch Plant project is shown in Figure 1. It is important that a thorough understanding of the existing conditions be presented.

Land Use

Land uses in the area are primarily residential, agricultural, and commercial. There are residential uses to the southwest of the site. There are commercial uses to the south of the site. The proposed Connell Asphalt Batch Plant site is currently vacant. The center of Wellington lies to the south of the proposed Connell Asphalt Batch Plant site.

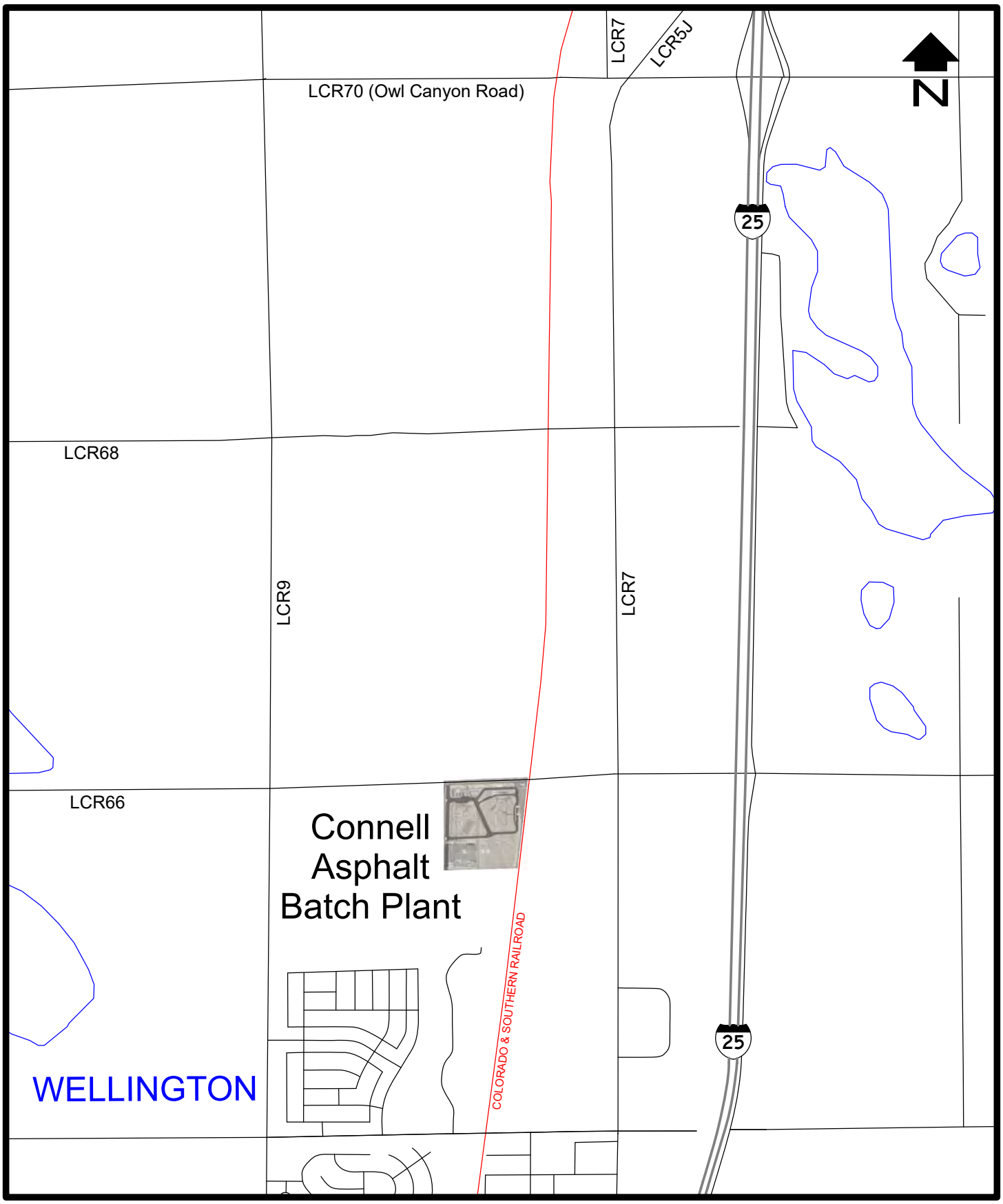
Streets

The primary roads near the Connell Asphalt Batch Plant site are LCR7, LCR66, and LCR70. Figure 2 shows a depiction of the existing geometry at various road intersections.

Larimer County Road 7 is to the east of the proposed Connell Asphalt Batch Plant site. It is a north-south road classified as an arterial according to the Wellington Master Street Plan. Currently, LCR7 has a two-lane rural cross section (no center lane) in this area. The posted speed limit in this area of LCR7 is 55 mph. At the LCR7/LCR66 intersection, LCR7 has all northbound and southbound movements combined into single lanes. The LCR7/LCR66 intersection has stop sign control on LCR66. Approaching LCR70, LCR7 veers to the east to line up with LCR5J before intersecting with LCR70. At the LCR70/LCR7-LCR5J intersection, LCR7 and LCR5J has all northbound and southbound movements combined into single lanes. The LCR70/LCR7-LCR5J intersection has stop sign control on LCR7 and LCR5J. Approximately 250 feet to the west of the LCR70/LCR7-LCR5J intersection, LCR7 continues to the north of LCR70. At the LCR70/LCR7 intersection, LCR7 has all southbound movements combined into a single lane. The LCR70/LCR7 intersection has stop sign control on LCR7. In the near future, LCR7 will be modified to line up with the north leg of LCR7 at LCR70.

Larimer County Road 66 is to the north of (adjacent to) the proposed Connell Asphalt Batch Plant site. It is an east-west road classified as an arterial according to the Wellington Master Street Plan. Currently, LCR66 has a paved two-lane rural cross section (no center lane) east of LCR7 and a gravel rural cross section west of LCR7. There is no posted speed limit in this area of LCR66. At the LCR7/LCR66 intersection, LCR66 has all eastbound and westbound movements combined into single lanes.

Larimer County Road 70 (Owl Canyon Road) is approximately two miles to the north of the proposed Connell Asphalt Batch Plant site. It is an east-west road classified as an arterial according to the Wellington Master Street Plan. Currently, LCR70 has a two-lane

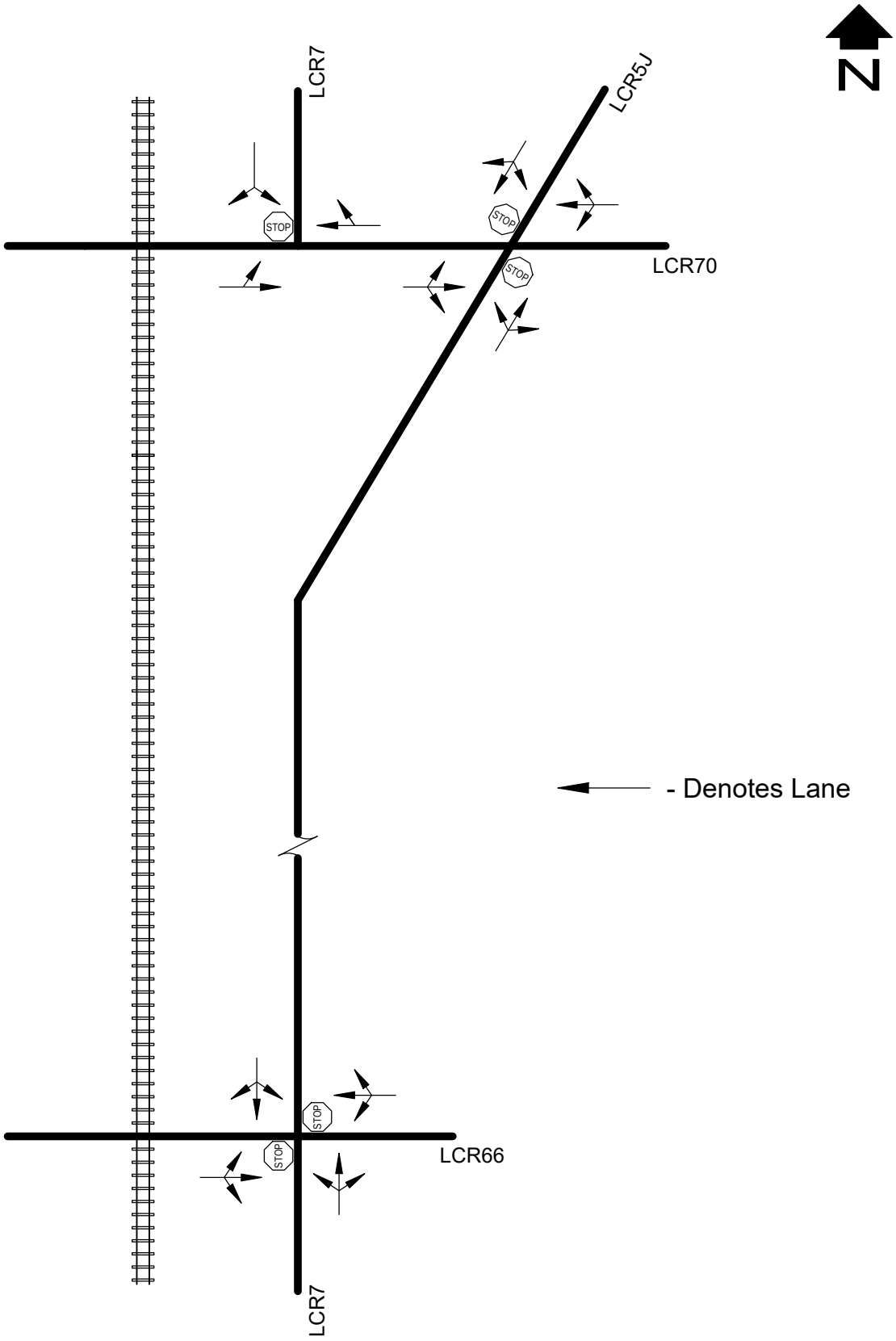


SCALE: 1"=2000'

SITE LOCATION

Figure 1

DELICH ASSOCIATES



EXISTING INTERSECTION GEOMETRY

Figure 2

rural cross section (no center lane) in this area. The posted speed limit in this area of LCR70 is 45 mph. At the LCR70/LCR7-LCR5J intersection, LCR70 has all eastbound and westbound movements combined into single lanes. At the LCR70/LCR7 intersection, LCR70 has all eastbound and westbound movements combined into single lanes. In the near future with the modification to LCR7, eastbound and westbound left-turn lanes will be constructed on LCR70.

Existing Traffic

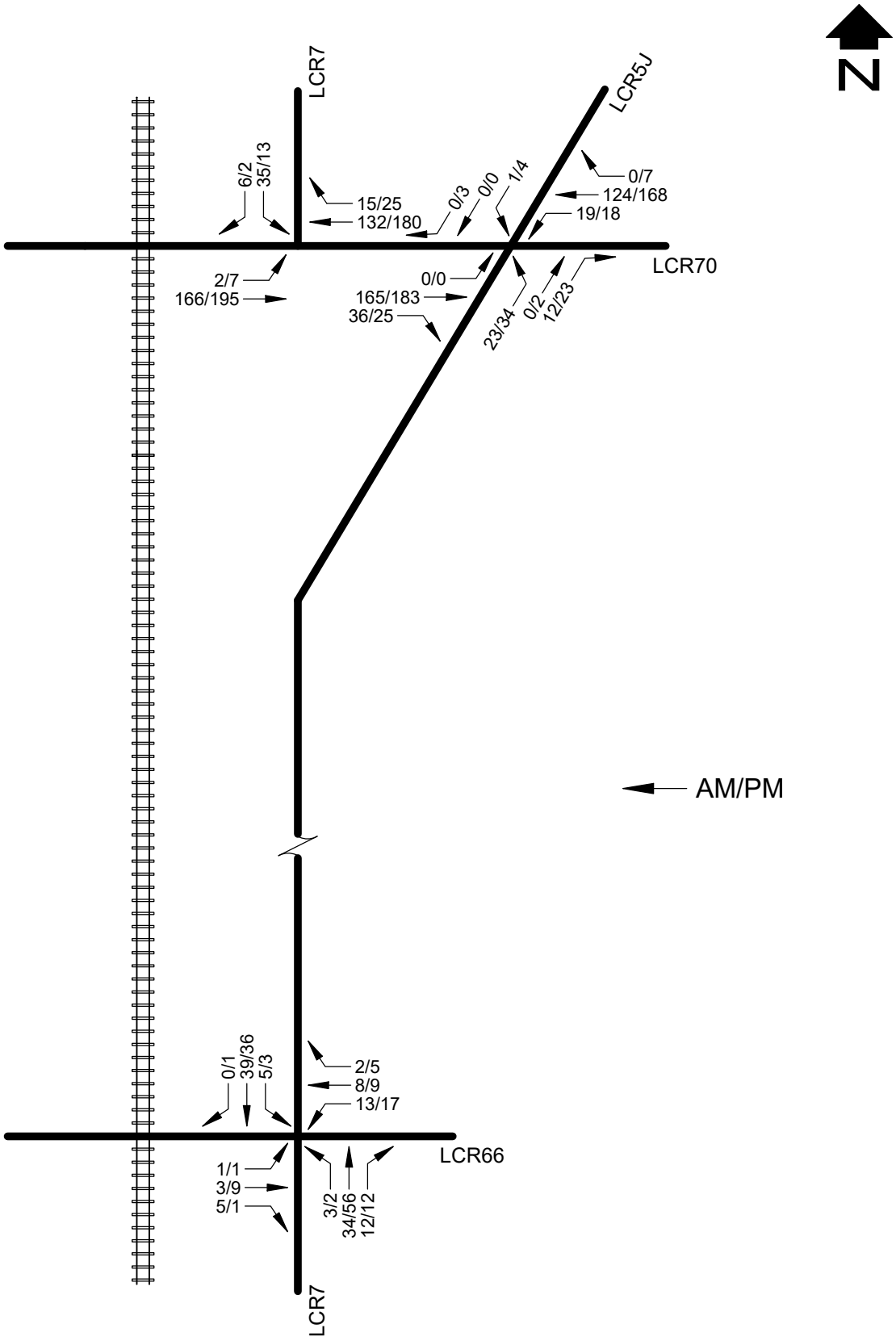
Recent weekday morning and afternoon peak hour traffic volumes at the LCR7/LCR66, LCR70/LCR7-LCR5J, and LCR70/LCR7 intersections are shown in Figure 3. The traffic counts were obtained in August 2022. Raw traffic count data is provided in Appendix B.

Existing Operation

Using the volumes shown in Figure 3, the current peak hour operation at the LCR7/LCR66, LCR70/LCR7-LCR5J, and LCR70/LCR7 intersections is shown in Table 1. Calculation forms for these analyses are provided in Appendix C. The key intersections were analyzed using the existing geometry and the unsignalized intersection techniques from the Highway Capacity Manual, 6th Edition (HCM). At major intersections, acceptable operation is defined by the Town of Wellington as level of service (LOS) C or better overall, LOS D for any approach leg, and LOS E for any movement. A description of level of service at unsignalized intersections from the HCM and a table showing the Wellington Motor Vehicle LOS Standards (Intersections) are also provided in Appendix C. As can be seen in Table 1, the key intersections are currently meeting the Wellington level of service standards in the peak hours with existing control and geometry.

Pedestrian/Bicycle Facilities

Due to the rural nature of this area of Wellington, sidewalks and bicycle facilities do not exist in this area.



RECENT PEAK HOUR TRAFFIC

Figure 3

TABLE 1 Current Peak Hour Operation			
Intersection	**Movement**	**Level of Service**	
		AM	**PM**
LCR7/LCR66 (stop sign)	EB LT/T/RT	A	A
	WB LT/T/RT	A	A
	NB LT/T/RT	A	A
	SB LT/T/RT	A	A
	OVERALL	A	A
LCR70/LCR7-LCR5J (stop sign)	NB LT/T/RT	B	B
	SB LT/T/RT	B	B
	EB LT/T/RT	A	A
	WB LT/T/RT	A	A
	OVERALL	A	A
LCR70/LCR7 (stop sign)	SB LT/RT	B	B
	EB LT/T	A	A
	OVERALL	A	A

III. PROPOSED DEVELOPMENT

Connell Resources is proposing an asphalt batch plant south of (adjacent to) Larimer County Road 66 (LCR66) and west of Larimer County Road 7 (LCR7). Figure 4 shows a site plan of the Connell Asphalt Batch Plant project. Access to the site will be via one full-movement access to/from LCR66. The short range analysis (Year 2025) includes the full development of the site and an appropriate increase in background traffic due to normal growth in the area. The long range future analysis year is considered to be 2045.

Trip Generation

Trip generation is important in considering the impact of a development such as this upon the existing and proposed street system. Trip Generation, 11th Edition, ITE is customarily used to calculate the trip generation for the land uses of a site. However, this land use is not contained in the cited reference. Therefore, information provided by Connell Resources was used to determine the trip generation. It is based upon the peak operation of a typical asphalt batch plant. The calculated trip generation for this use is 254 weekday daily trip ends, 64 weekday morning peak hour trip ends, and 64 weekday afternoon peak hour trip ends. The trip generation was agreed upon in the TIS scoping meeting.

TABLE 2
Trip Generation

Code	Use	Size	AWDTE		AM Peak Hour				PM Peak Hour			
			Rate	Trips	Rate	In	Rate	Out	Rate	In	Rate	Out
N/A	On-site Employees	21 Employees	N/A	50	N/A	21	N/A	0	N/A	0	N/A	21
N/A	Truck Drivers	31 Employees	N/A	62	N/A	31	N/A	0	N/A	0	N/A	31
N/A	Aggregate Trucks	4 Trucks	N/A	64	N/A	0	N/A	4	N/A	4	N/A	0
N/A	Liquid Asphalt Trucks	3 Trucks	N/A	6	N/A	1	N/A	0	N/A	0	N/A	1
N/A	Finished Product Trucks	36 Trucks	N/A	72	N/A	0	N/A	7	N/A	7	N/A	0
Total				254		53		11		11		53

N

SCALE: 1"=200'

SITE PLAN

Figure 4

DELICH ASSOCIATES

Trip Distribution

Trip distribution for the Connell Asphalt Batch Plant was based on the origin/ destination of the various employees and trucks using the facility and engineering judgment. The designated route for the truck traffic will be to use LCR7 and LCR70 to access I-25. A few trucks may use LCR70 to go to/from the west. The trip distribution was agreed upon in the TIS scoping meeting and is contained in Appendix A.

Background Traffic Projections

Currently, LCR7 veers to the east to line up with LCR5J before intersecting with LCR70. Approximately 250 feet to the west of the LCR70/LCR7-LCR5J intersection, LCR7 continues to the north of LCR70. In the near future, LCR7 will be modified to line up with the north leg of LCR7 at LCR70. The traffic forecasts reflect the LCR7 realignment. Figures 5 and 6 show the short range (2025) and long range (2045) background weekday peak hour traffic projections. Background traffic projections for the short range and long range were factored at a rate of two percent per year on all roads. The long range (2045) background traffic includes development of a residential subdivision in the southeast quadrant of the LCR9/LCR66 intersection.

Trip Assignment/Total Traffic

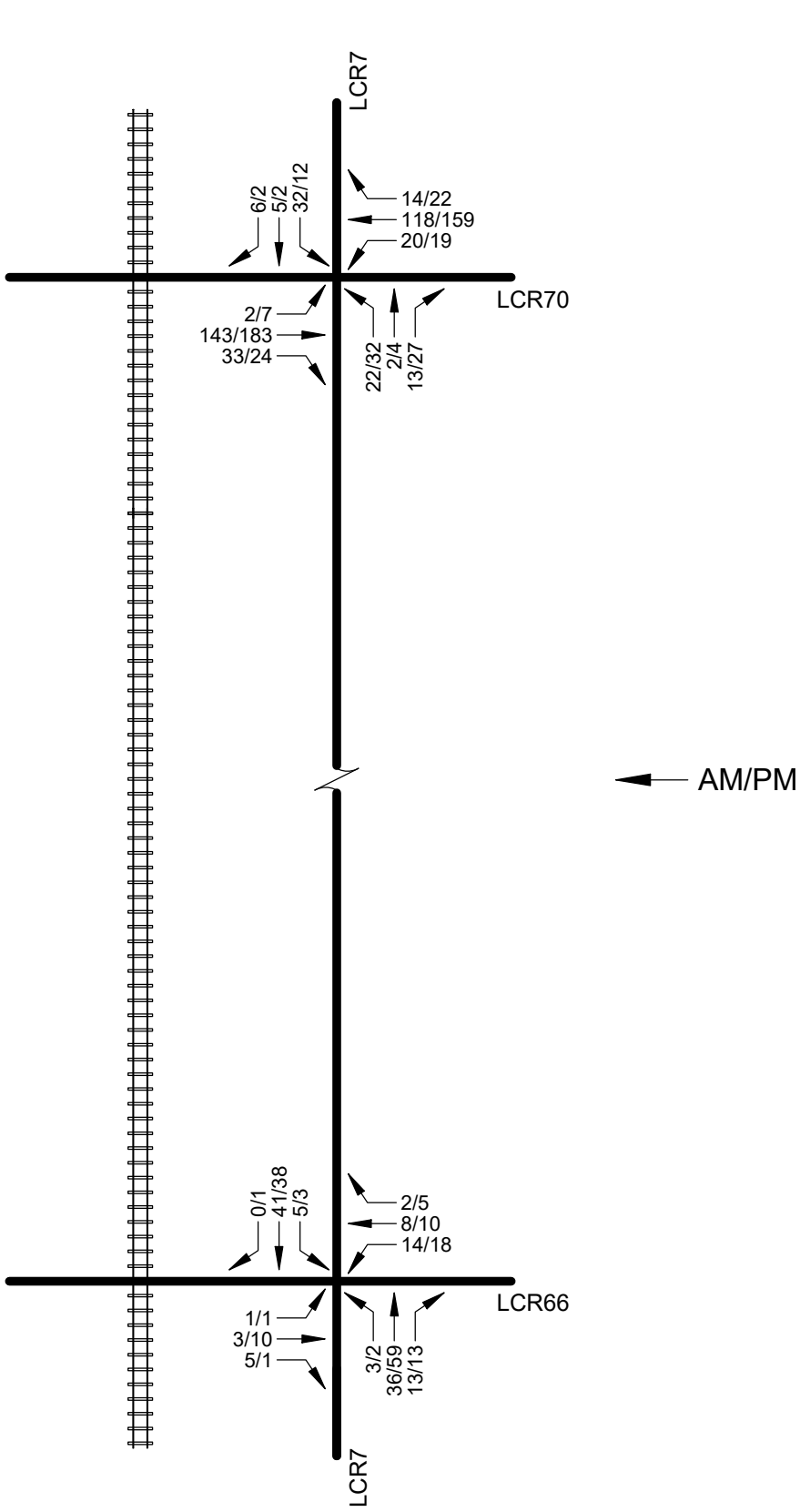
Trip assignment is how the generated and distributed trips are expected to be loaded on the road system. The assigned trips are the resultant of the trip distribution process. Figure 7 shows the site generated weekday morning and afternoon peak hour traffic assignment. The passenger car equivalents (PCE's) for trucks are shown on Figure 7. Passenger car equivalents are used to determine the auxiliary lane requirements. Figures 8 and 9 show the respective short range (2025) and long range (2045) total (site plus background) peak hour traffic at the LCR7/LCR66 and LCR70/LCR7 intersections.

Signal Warrants

None of the key intersections will meet signal warrants. It is not expected that the key intersections will be signalized in the future.

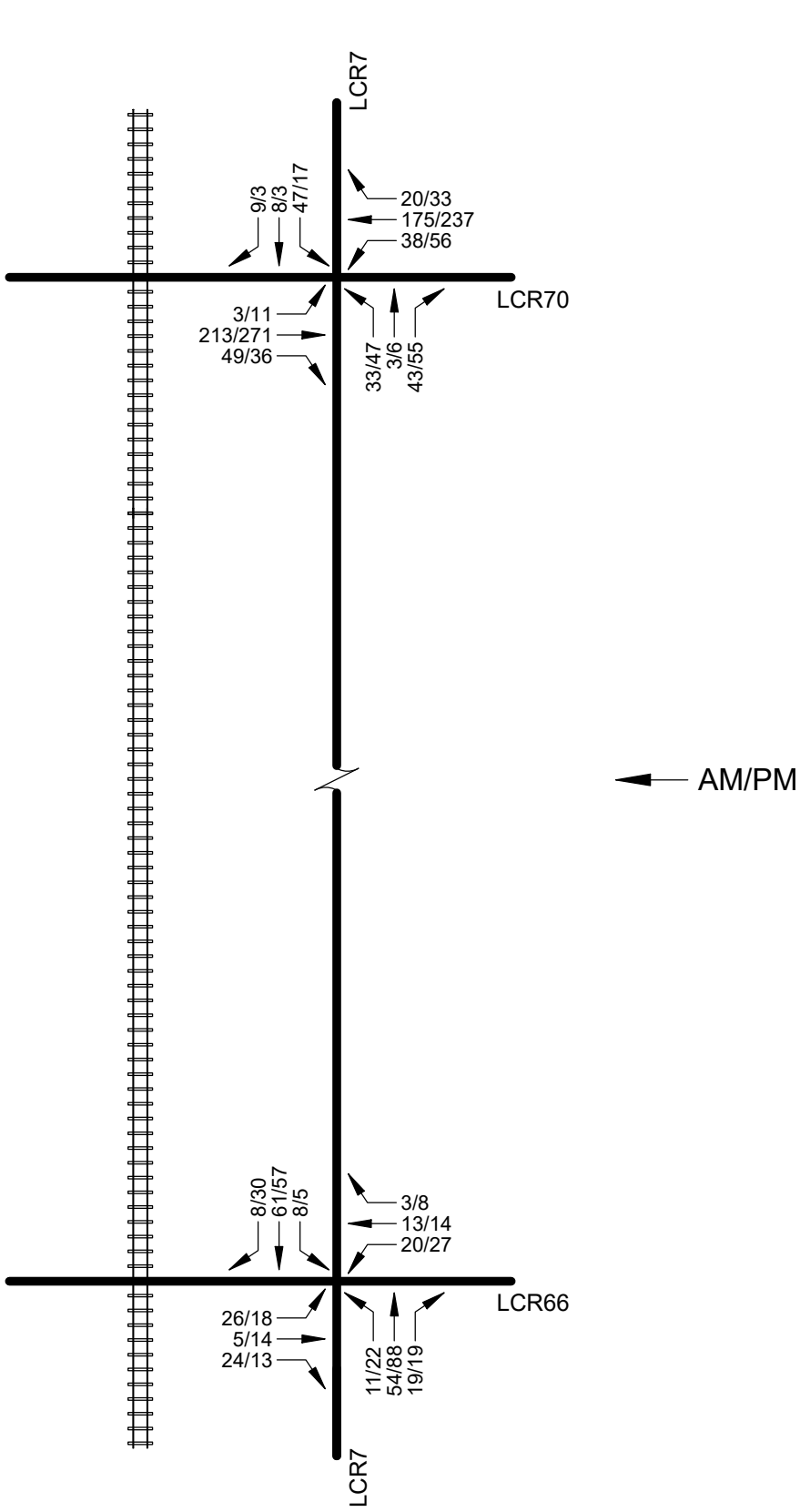
Geometry

As mentioned earlier, LCR7 will be modified to line up with the north leg of LCR7 at LCR70 in the near future. This reconstructed LCR70/LCR7 intersection will included eastbound and westbound left-turn lanes. Figure 10 shows a schematic of the short range (2025) geometry. Auxiliary turn lane requirements are based on the Town of Wellington **Standard Design Criteria and Standard Construction Requirements**. As arterial



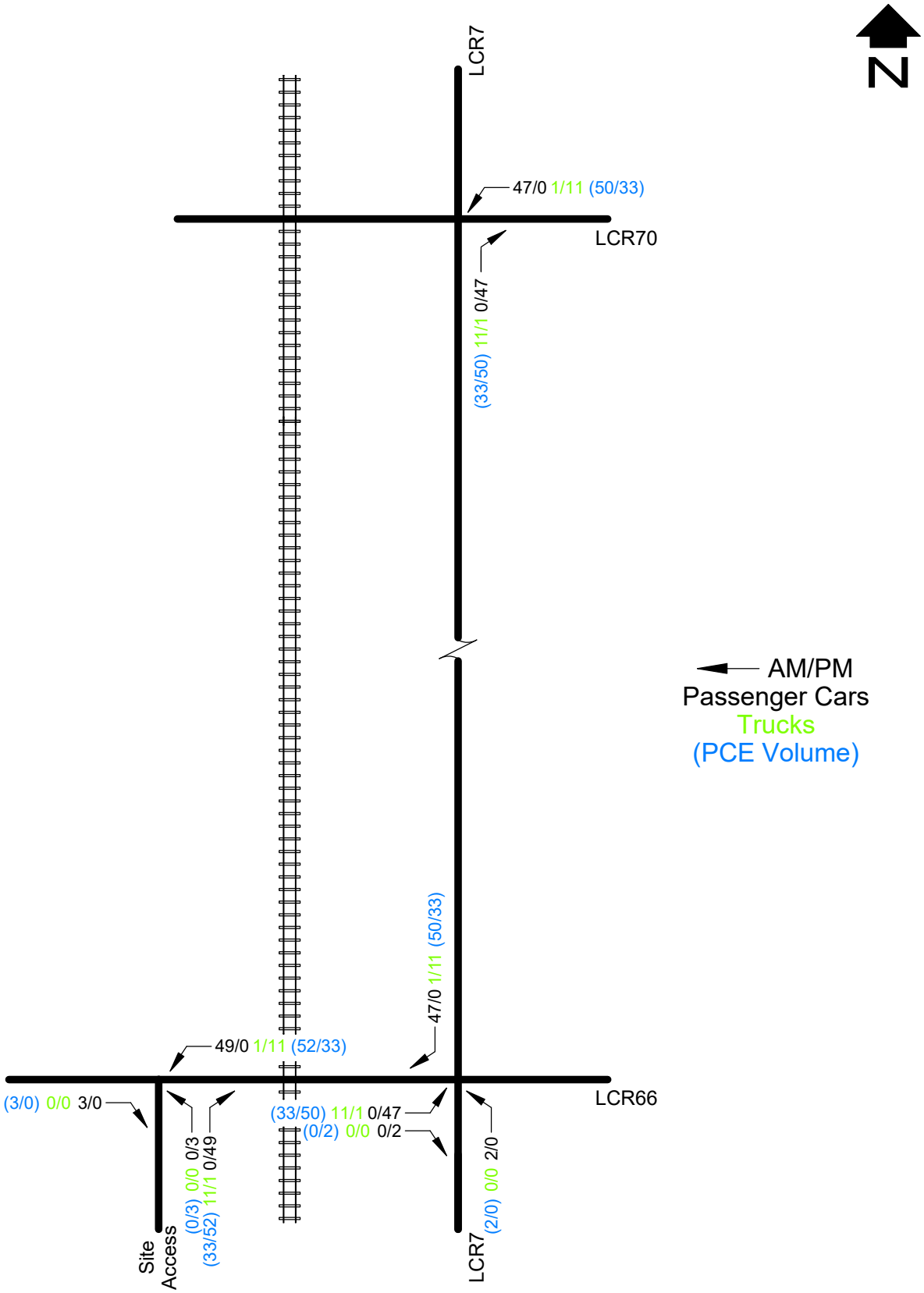
SHORT RANGE (2025) BACKGROUND PEAK HOUR TRAFFIC

Figure 5



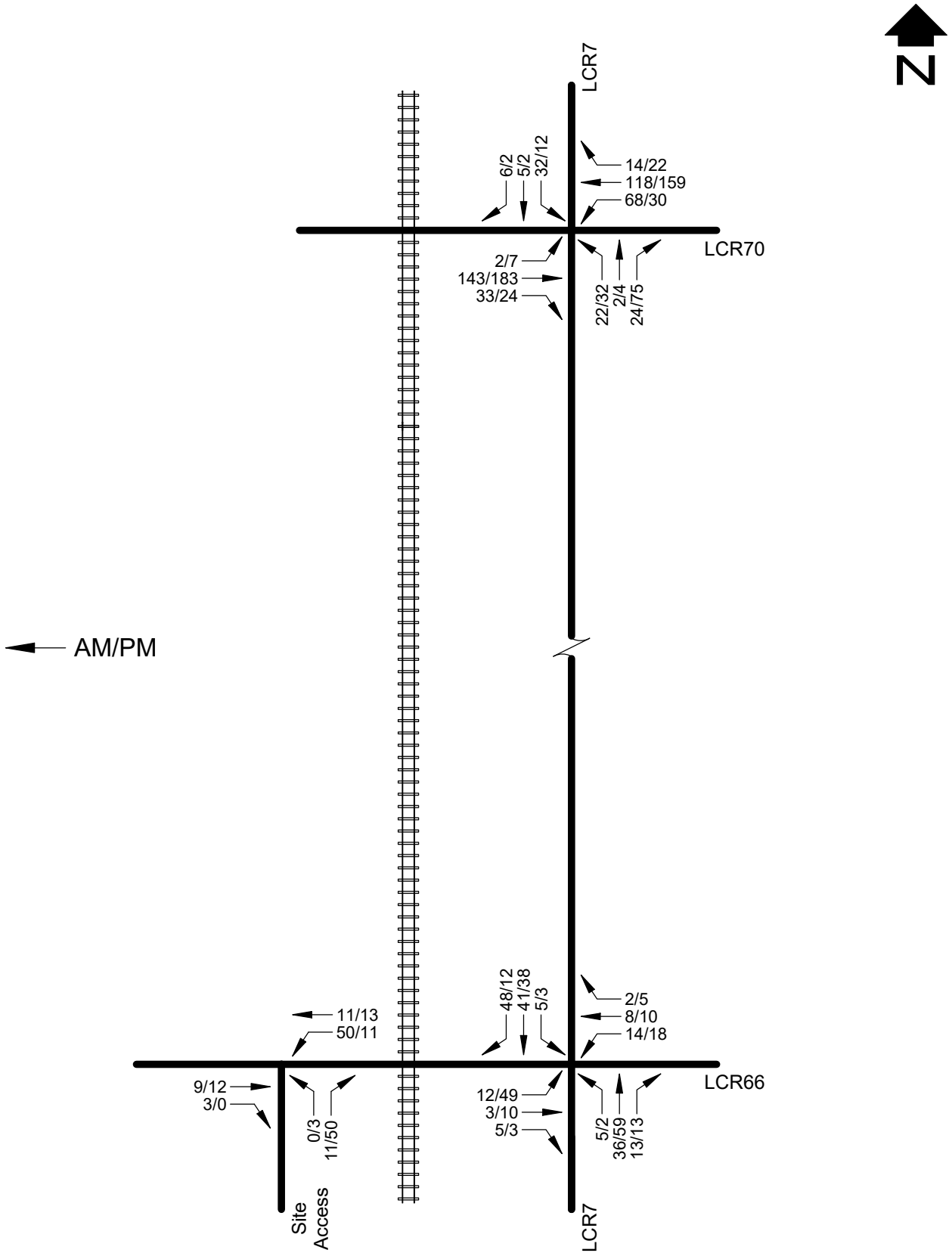
LONG RANGE (2045) BACKGROUND PEAK HOUR TRAFFIC

Figure 6



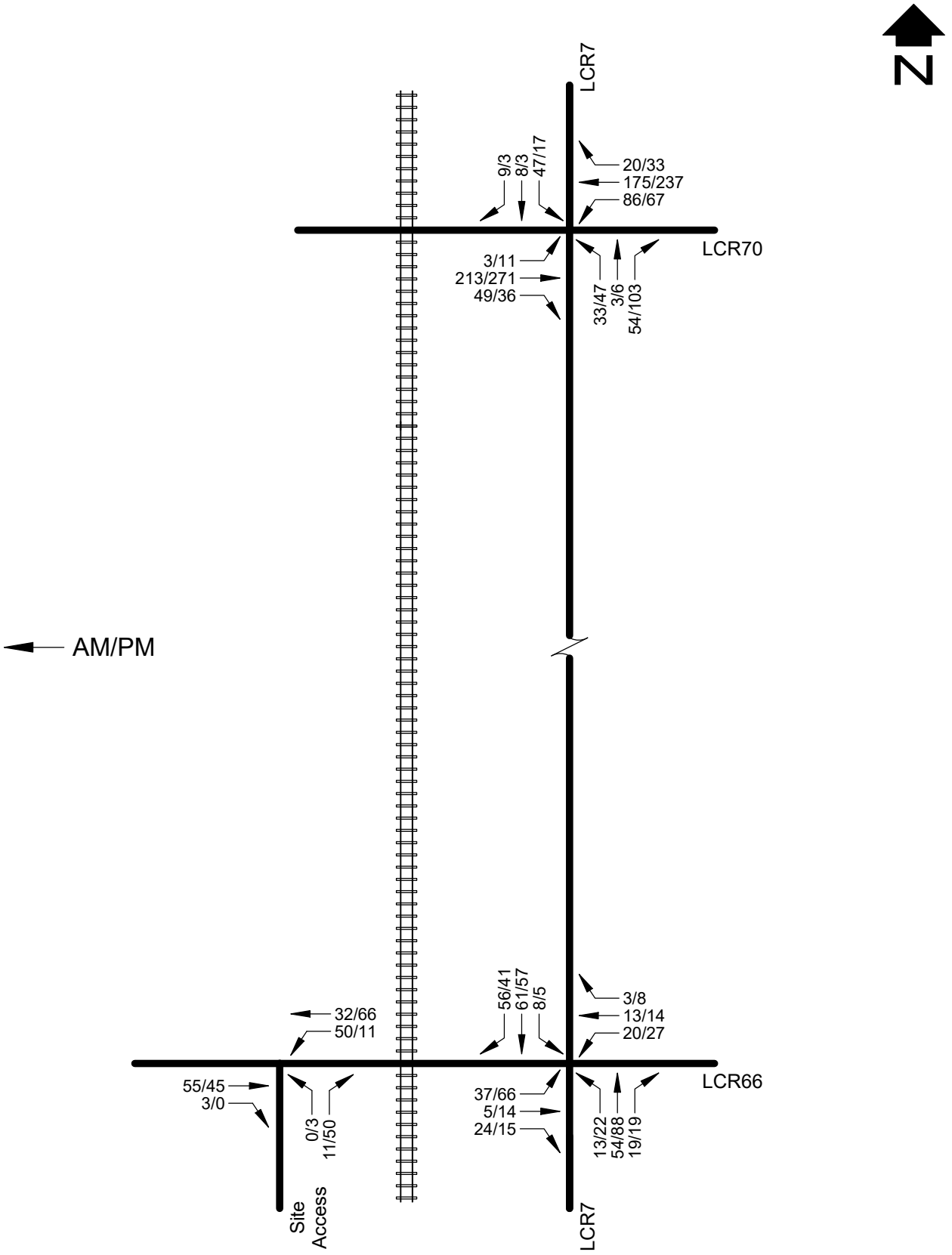
SITE GENERATED PEAK HOUR TRAFFIC

Figure 7



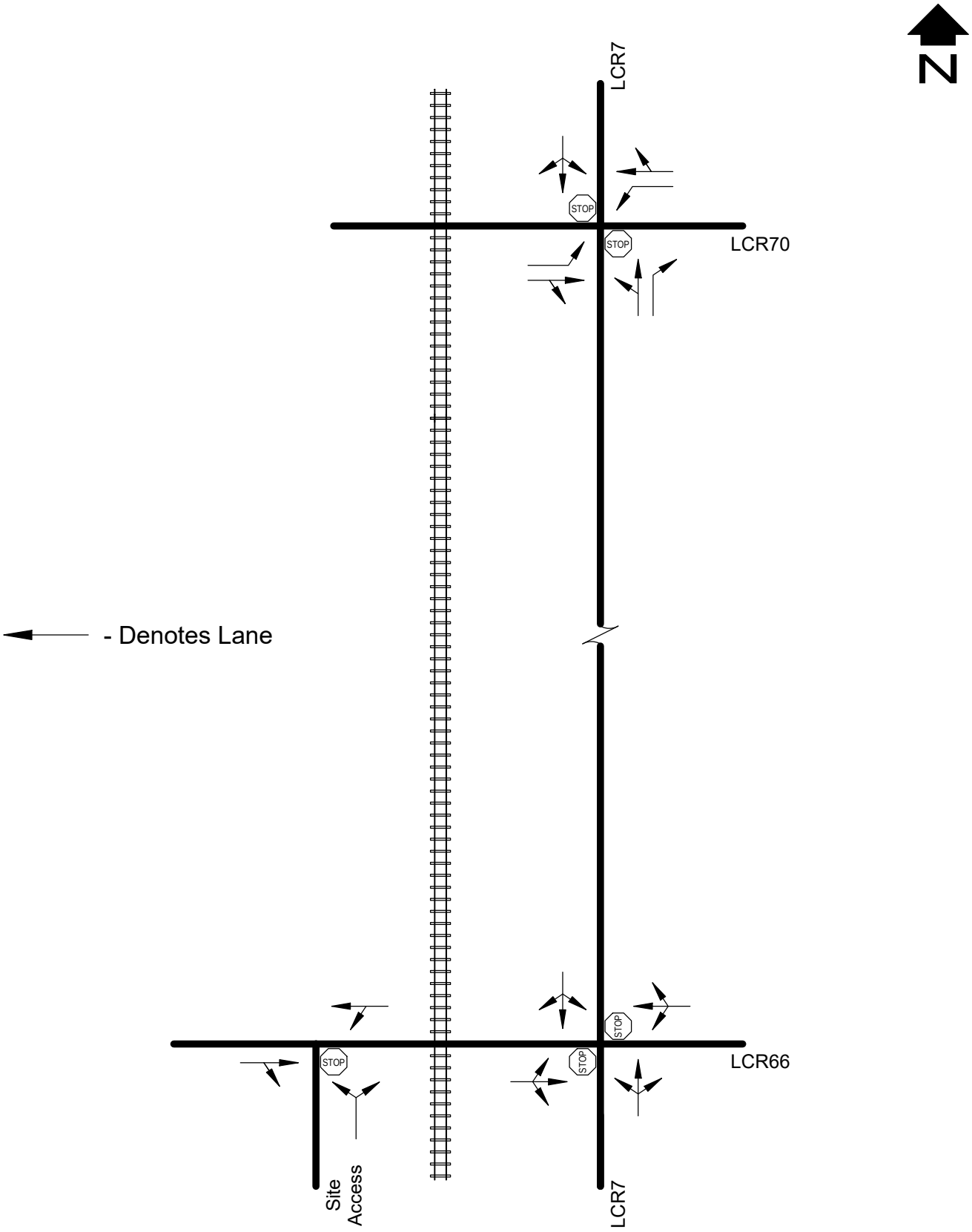
SHORT RANGE (2025) TOTAL PEAK HOUR TRAFFIC

Figure 8



LONG RANGE (2045) TOTAL PEAK HOUR TRAFFIC

Figure 9



SHORT RANGE (2025) GEOMETRY

Figure 10

DELICH ASSOCIATES

streets, LCR7 and LCR66 are supposed to have left-turn deceleration lanes at all intersections. However, since this area of Wellington is fairly rural, LCR7 and LCR66 are not expected to be reconstructed to the full arterial street standards until other significant development occurs. With the addition of the Connell Asphalt Batch Plant site generated traffic, a northbound right-turn lane will be required approaching the LCR70/LCR7 intersection in the short range (2025) future.

Figure 11 shows a schematic of the long range (2045) geometry. It was assumed that LCR7 would be constructed to a full arterial cross section by/before the long range (2045) future. A southbound right-turn lane will be required approaching the LCR7/LCR66 intersection in the long range (2045) future.

Operation Analysis

Capacity analyses were performed at the LCR7/LCR66, LCR70/LCR7, and LCR66/ Site Access intersections. The operations analyses were conducted for the short range and long range futures, reflecting year 2025 and 2045 conditions, respectively.

Using the traffic volumes shown in Figure 5, the LCR7/LCR66 and LCR70/LCR7 intersections operate in the short range (2025) background traffic future as indicated in Table 4. Calculation forms for these analyses are provided in Appendix D. The LCR7/LCR66 and LCR70/LCR7 intersections meet the Wellington operational criteria.

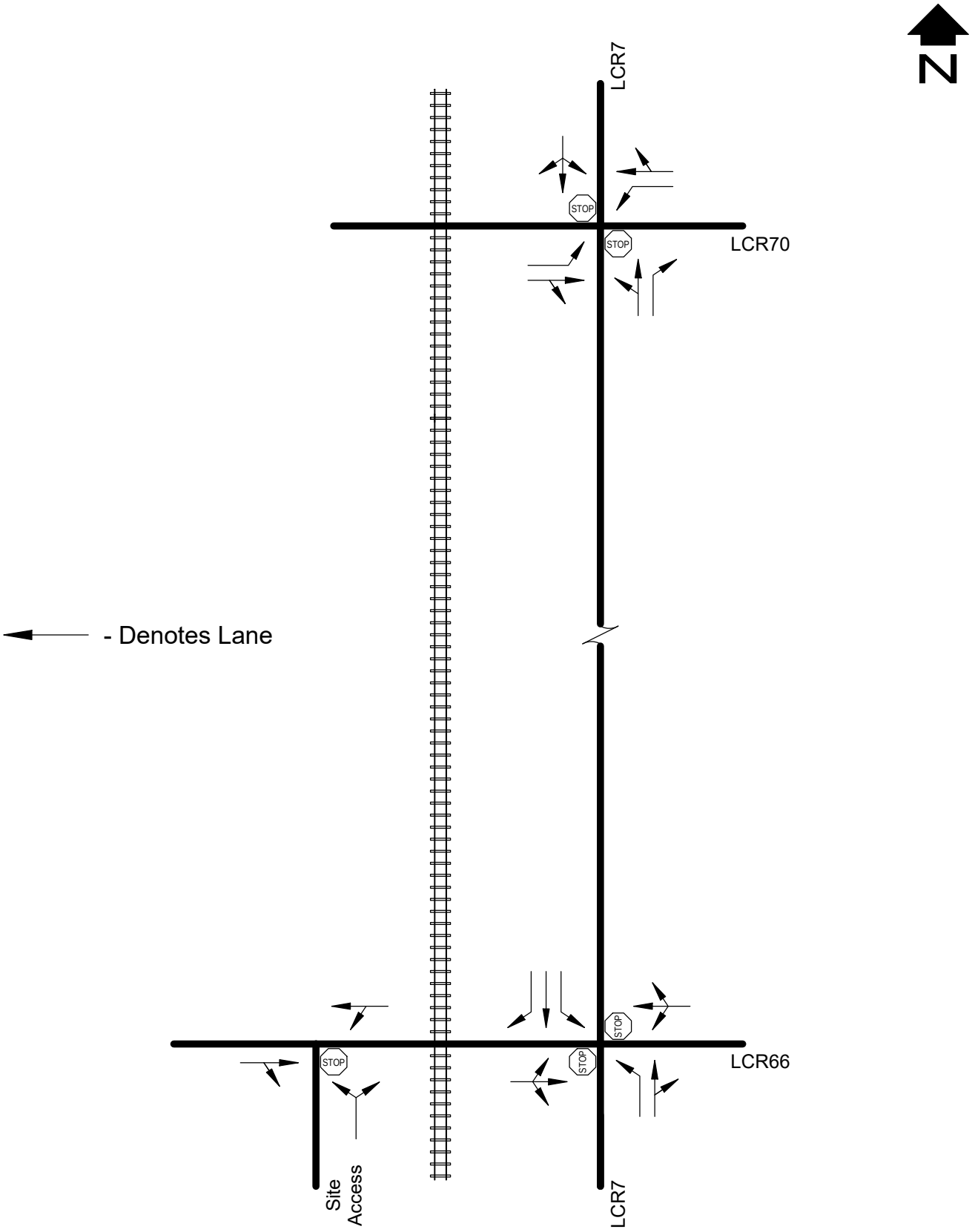
Using the traffic volumes shown in Figure 6, the LCR7/LCR66 and LCR70/LCR7 intersections operate in the long range (2045) background traffic future as indicated in Table 5. Calculation forms for these analyses are provided in Appendix E. The LCR7/LCR66 and LCR70/LCR7 intersections meet the Wellington operational criteria.

Table 6 shows the short range (2025) total peak hour operation at the LCR7/LCR66, LCR70/LCR7, and LCR66/Site Access intersections. Calculation forms are provided in Appendix F. The key intersections meet the Town of Wellington operational criteria during the morning and afternoon peak hours.

Table 7 shows the long range (2045) total peak hour operation at the LCR7/LCR66, LCR70/LCR7, and LCR66/Site Access intersections. Calculation forms are provided in Appendix G. The key intersections meet the Town of Wellington operational criteria during the morning and afternoon peak hours.

Pedestrian/Bicycle Facilities

Due to the heavy industrial land use at the proposed Connell Asphalt Batch Plant site, it is doubtful that there would be any pedestrian or bicycle trips to/from this site. Therefore, rigorous analysis of the pedestrian and bicycle level of service was not included in this TIS.



LONG RANGE (2045) GEOMETRY

Figure 11

DELICH ASSOCIATES

TABLE 3 Short Range (2025) Background Peak Hour Operation			
Intersection	**Movement**	**Level of Service**	
		AM	**PM**
LCR7/LCR66 (stop sign)	EB LT/T/RT	A	A
	WB LT/T/RT	A	A
	NB LT/T/RT	A	A
	SB LT/T/RT	A	A
	OVERALL	A	A
LCR70/LCR7 (stop sign)	NB LT/T/RT	B	B
	SB LT/T/RT	B	B
	EB LT	A	A
	WB LT	A	A
	OVERALL	A	A

TABLE 4 Long Range (2045) Background Peak Hour Operation			
Intersection	**Movement**	**Level of Service**	
		AM	**PM**
LCR7/LCR66 (stop sign)	EB LT/T/RT	A	B
	WB LT/T/RT	B	B
	NB LT	A	A
	SB LT	A	A
	OVERALL	A	A
LCR70/LCR7 (stop sign)	NB LT/T/RT	B	C
	SB LT/T/RT	C	C
	EB LT	A	A
	WB LT	A	A
	OVERALL	A	A

TABLE 5 Short Range (2025) Total Peak Hour Operation			
Intersection	**Movement**	**Level of Service**	
		AM	**PM**
LCR7/LCR66 (stop sign)	EB LT/T/RT	B	A
	WB LT/T/RT	A	A
	NB LT/T/RT	A	A
	SB LT/T/RT	A	A
	OVERALL	A	A
LCR70/LCR7 (stop sign)	NB LT/T	B	B
	NB RT	B	B
	NB APPROACH	B	B
	SB LT/T/RT	B	B
	EB LT	A	A
	WB LT	A	A
	OVERALL	A	A
LCR66/Site Access (stop sign)	NB LT/RT	A	A
	WB LT/T	A	A
	OVERALL	A	A

TABLE 6 Long Range (2045) Total Peak Hour Operation			
Intersection	**Movement**	**Level of Service**	
		AM	**PM**
LCR7/LCR66 (stop sign)	EB LT/T/RT	B	B
	WB LT/T/RT	B	B
	NB LT	A	A
	SB LT	A	A
	OVERALL	A	A
LCR70/LCR7 (stop sign)	NB LT/T	C	C
	NB RT	B	B
	NB APPROACH	B	B
	SB LT/T/RT	C	C
	EB LT	A	A
	WB LT	A	A
	OVERALL	A	A
LCR66/Site Access (stop sign)	NB LT/RT	A	A
	WB LT/T	A	A
	OVERALL	A	A

IV. CONCLUSIONS

This study assessed the impacts of the Connell Asphalt Batch Plant project on the street system in the vicinity of the proposed development in the short range (2025) and long range (2045) futures. As a result of this analysis, the following is concluded:

- The development of the Connell Asphalt Batch Plant is feasible from a traffic engineering standpoint. The Connell Asphalt Batch Plant project will generate approximately 254 daily trip ends, 64 weekday morning peak hour trip ends, and 64 weekday afternoon peak hour trip ends.

- None of the key intersections will be signalized in the future.

- In the short range (2025) future, given development of the Connell Asphalt Batch Plant and an increase in background traffic, the key intersections meet the Wellington operational criteria.

- In the long range (2045) future, given development of the Connell Asphalt Batch Plant and an increase in background traffic, the key intersections meet the Wellington operational criteria.

- The short range (2025) geometry is shown in Figure 10. With the addition of the Connell Asphalt Batch Plant site generated traffic, a northbound right-turn lane will be required approaching the LCR70/LCR7 intersection. Figure 11 shows a schematic of the long range (2045) geometry. It was assumed that LCR7 would be constructed to a full arterial cross section by/before the long range (2045) future. A southbound right-turn lane will be required approaching the LCR7/LCR66 intersection in the long range (2045) future.

APPENDIX A

Attachment A
Transportation Impact Study
Base Assumptions

Project Information		
Project Name	CONNELL ASPHALT BATCH PLANT	
Project Location	SOUTH OF LCR66, BETWEEN LCR 7 & LCR 9	
TIS Assumptions		
Type of Study	Full: YES	Memo:
Study Area Boundaries	North: LCR 70 (OCR)	South: LCR 66 (SITE)
	East: LCR 7	West: SITE ACCESS
Study Years	Short Range: 2025	Long Range: 2045
Future Traffic Growth Rate	2%/YEAR PLUS KNOWN/APPROVED DEVELOPMENTS (TOWN PROVIDE)	
Study Intersections	1. All access drives (1)	5.
	2. LCR66/LCR 7	6.
	3. LCR7/LCR 70(OCR)	7.
	4.	8.
Time Period for Study	AM: 7:00-9:00 / PM: 4:00-6:00	Sat Noon: NO
Trip Generation Rates	ATTACHED	
Trip Adjustment Factors	Passby: N/A	Captive Market: N/A
Overall Trip Distribution	SEE ATTACHED	
Mode Split Assumptions	AS NOTED IN TRIP GENERATION	
Committed Roadway Improvements	LARIMER COUNTY IMPROVEMENTS TO OWL CANYON ROAD.	
Other Traffic Studies	TOWN PROVIDE	
Areas Requiring Special Study	NONE	

Date: AUGUST 5, 2022

Traffic Engineer: DELICH ASSOCIATES

Wellington Town Administrator or Engineer: OK, PER MEETING ON 8/12/22

2216 BAF

WELLINGTON BATCH PLANT
CONNELL RESOURCES
CONNELL
UTILITY PLAN
DESIGNED BY: D. Eggar
DRAWN BY: R. Bunner
APPROVED BY: J. Burrell
DATE: June 1, 2022
SCALE: 1" = 80'
FILE NAME: Overall Utility.dwg
SHEET STATUS
30% PLAN SET
NOT FOR CONSTRUCTION
P.E. Seal
ditesco
Project & Construction Services
2133 S. Timberline Road, Suite 110
Fort Collins, Colorado 80525
Phone: 970.632.5068
www.ditescoservices.com
PROJECT NUMBER XXXX
SHEET NUMBER C301
SHEET INDEX: 3
SCALE: 1" = 80'
(True scale for 22x34 sheet size)
0
80'
160'
240'
Colorado & Southern Railroad
Larimer County Road 66
North Poudre Irrigation Co. Canal
Parcel
1,549,321 SF
35.568 Acres
PROPOSED SANITARY SEWER SERVICE
PROPOSED SANITARY SEWER MANHOLE, TYP
PROPOSED 8" WATERLINE
PROPOSED SANITARY SEWER SERVICE WITH GREASE INTERCEPTOR
PROPOSED FIRE HYDRANT
PROPOSED WATER SERVICE, TYP
EXISTING 16" WATERLINE
50' SINCLAIR PIPELINE EASEMENT REC. NO. 840508
20' UTILITY & TCE REC. NO. 20030053554
50' EMERGENCY ACCESS EASEMENT REC. NO. 20030053592
50' NORTH POUDRE IRRIGATION COMPANY ROW EASEMENT REC. NO. 19970024537
Drawing Name: O:\Projects\Wellington Batch Plant\Dwg\Sheets\Connell Utility.dwg Wednesday, June 01, 2022 2:45 PM By: Shonda Bunner

TRIP GENERATION HOURS OF OPERATION 7AM TO 5PM

ANALYZE PEAKS 7-8 AM 4-5PM

ON-SITE EMPLOYEES - 21 (PASSENGER CARS)

AM - START - 21 INBOUND
0 OUTBOUND

PM - END - 0 INBOUND
21 OUTBOUND

DAILY - (42)(1.2) = 50 TE (20% IN/OUT NON PEAKS)

TRUCK DRIVERS - 31 (PASSENGER CARS)

AM - START - 31 INBOUND
0 OUTBOUND

PM - END - 0 INBOUND
31 OUTBOUND

DAILY - 62 TRIP ENDS

AGGREGATE TRUCKS - ALL AGGREGATE FROM CARR PIT
ALL AGGREGATE TRUCKS STORED AT THE SITE OVERNIGHT. 32 LOADS/DAY - 4/HOUR

AM - START - 0 INBOUND
4 OUTBOUND

PM - END - 4 INBOUND
0 OUTBOUND

DAILY - (32)(2) = 64 TRIP ENDS

LIQUID ASPHALT TRUCKS - 3 LOADS/DAY

AM - START - 1 INBOUND
0 OUTBOUND

PM - END - 0 INBOUND
1 OUTBOUND

DAILY - (3)(2) = 6 TRIP ENDS

FINISHED PRODUCT TRUCKS - ALL STORED AT THE SITE OVER NIGHT
32-38 PER DAY (USE 36)

DAILY 36 INBOUND } 72 TG
36 OUTBOUND }

7AM - 5PM - 10 HOURS

$\frac{72 \text{ TG}}{10 \text{ HOURS}} = 7 / \text{HOUR}$

AM - START 0 INBOUND
7 OUTBOUND

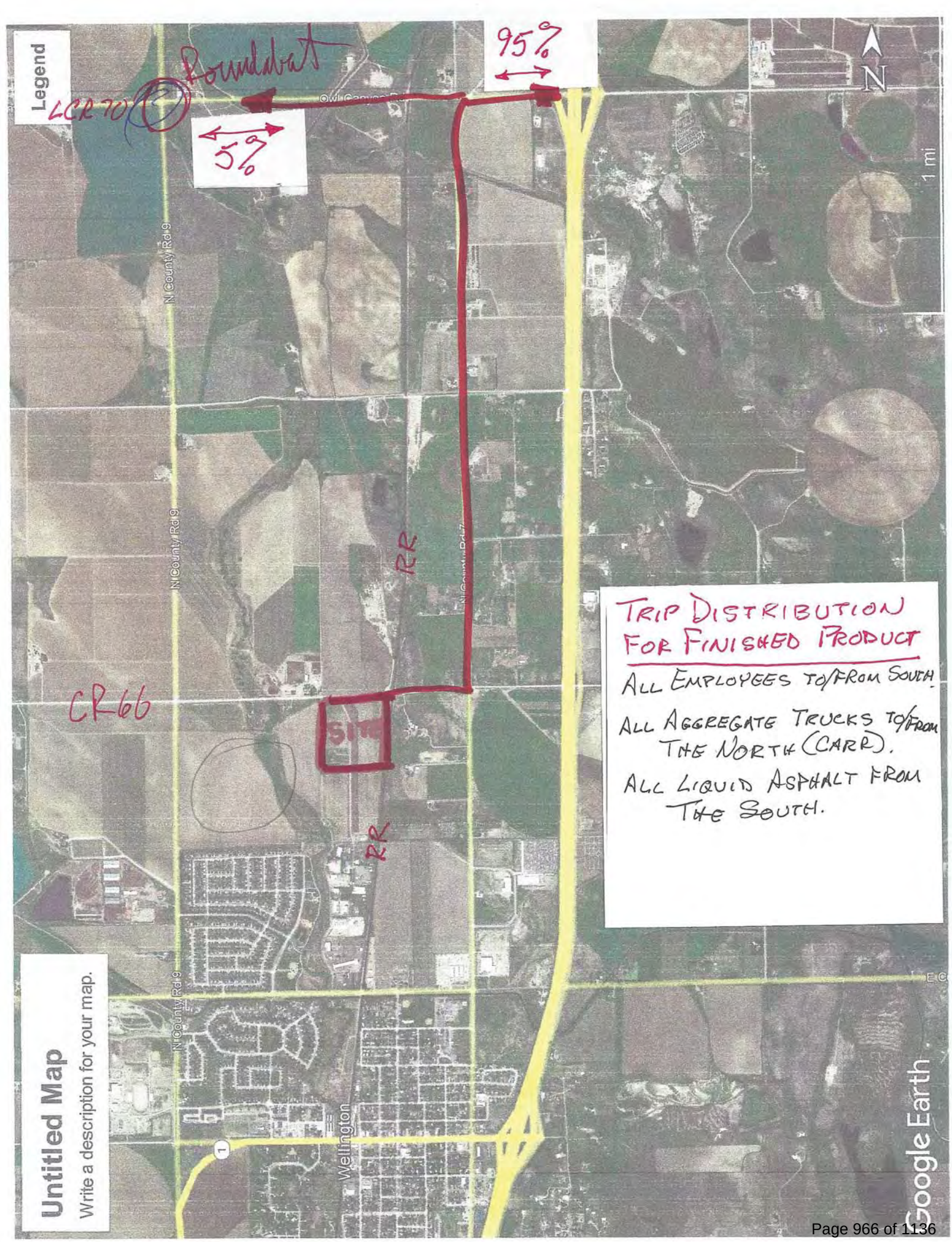
PM - END 7 INBOUND
0 OUTBOUND

TRIP GENERATION SUMMARY

DAILY - 254 TRIP ENDS

AM IN - 53 } 64 TRIP ENDS
OUT - 11 }

PM IN - 11 } 64 TRIP ENDS
OUT - 53 }


Legend
Roundabout
LCR 70
95%
5%
N
1 mi
N County Rd 9
N County Rd 7
RR
CR 66
Site
Wellington
Google Earth
TRIP DISTRIBUTION FOR FINISHED PRODUCT
ALL EMPLOYEES TO/FROM SOUTH.
ALL AGGREGATE TRUCKS TO/FROM THE NORTH (CARR).
ALL LIQUID ASPHALT FROM THE SOUTH.
Untitled Map
Write a description for your map.

APPENDIX B

DELICH ASSOCIATES
2272 GLEN HAVEN DRIVE
LOVELAND, CO 80538
Phone: (970) 669-2061

TABULAR SUMMARY OF VEHICLE COUNTS

Date: 8/18/2022 Observer: Vickie

Day: Thursday Jurisdiction: Wellington/Larimer County

Intersection: LCR66/LCR7

R = right turn
S = straight
L = left turn

Time	Northbound: LCR7				Southbound: LCR7				Total	Eastbound: LCR66				Westbound: LCR66				Total	Total
Begins	L	S	R	Total	L	S	R	Total	north/south	L	S	R	Total	L	S	R	Total	east/west	All
7:00	0	3	3	6	0	9	0	9	15	0	3	0	3	2	1	0	3	6	21
7:15	0	5	0	5	0	13	2	15	20	0	1	0	1	2	1	0	3	4	24
7:30	1	10	3	14	0	21	0	21	35	0	0	0	0	4	1	1	6	6	41
7:45	0	12	3	15	2	8	0	10	25	0	1	3	4	2	1	0	3	7	32
8:00	1	3	3	7	0	5	0	5	12	1	1	1	3	4	4	1	9	12	24
8:15	1	9	3	13	3	5	0	8	21	0	1	1	2	3	2	0	5	7	28
8:30	2	4	4	10	1	14	1	16	26	0	1	2	3	3	3	0	6	9	35
8:45	0	10	4	14	0	6	0	6	20	0	3	1	4	7	2	0	9	13	33
7:30-8:30	3	34	12	49	5	39	0	44	93	1	3	5	9	13	8	2	23	32	125
PHF	0.75	0.71	1	0.82	0.42	0.46	n/a	0.52	0.66	0.25	0.75	0.42	0.56	0.81	0.5	0.5	0.64	0.67	0.76
4:00	0	8	3	11	0	7	0	7	18	0	2	2	4	5	3	1	9	13	31
4:15	0	15	4	19	0	5	0	5	24	0	5	0	5	1	0	2	3	8	32
4:30	0	16	4	20	0	7	0	7	27	0	2	0	2	7	2	2	11	13	40
4:45	0	14	5	19	1	13	0	14	33	0	3	0	3	5	2	0	7	10	43
5:00	2	11	2	15	2	12	0	14	29	1	2	1	4	1	1	0	2	6	35
5:15	0	15	1	16	0	4	1	5	21	0	2	0	2	4	4	3	11	13	34
5:30	3	11	2	16	0	5	0	5	21	0	5	1	6	7	2	3	12	18	39
5:45	1	9	4	14	1	5	0	6	20	0	3	1	4	8	2	1	11	15	35
4:30-5:30	2	56	12	70	3	36	1	40	110	1	9	1	11	17	9	5	31	42	152
PHF	0.25	0.88	0.6	0.88	0.38	0.69	0.25	0.71	0.83	0.25	0.75	0.25	0.69	0.61	0.56	0.42	0.7	0.81	0.88

DELICH ASSOCIATES
2272 GLEN HAVEN DRIVE
LOVELAND, CO 80538
Phone: (970) 669-2061

TABULAR SUMMARY OF VEHICLE COUNTS

Date: 8/17/2022 Observer: Vickie

Day: Wednesday Jurisdiction: Wellington/Larimer County

Intersection: LCR70/LCR7-LCR5J

R = right turn
S = straight
L = left turn

Time	Northbound: LCR7				Southbound: LCR5J				Total	Eastbound: LCR70				Westbound: LCR70				Total	Total
Begins	L	S	R	Total	L	S	R	Total	north/south	L	S	R	Total	L	S	R	Total	east/west	All
7:00	2	1	1	4	0	1	0	1	5	0	29	7	36	1	23	0	24	60	65
7:15	3	0	4	7	1	0	0	1	8	0	42	17	59	6	29	0	35	94	102
7:30	5	0	5	10	0	0	0	0	10	0	43	9	52	9	32	0	41	93	103
7:45	12	0	2	14	0	0	0	0	14	0	40	5	45	3	44	0	47	92	106
8:00	3	0	1	4	0	0	0	0	4	0	40	5	45	1	19	0	20	65	69
8:15	3	0	1	4	0	0	0	0	4	1	36	5	42	3	17	0	20	62	66
8:30	3	0	1	4	0	0	1	1	5	0	35	7	42	4	47	0	51	93	98
8:45	8	1	2	11	0	0	0	0	11	0	31	4	35	3	62	2	67	102	113
7:15-8:15	23	0	12	35	1	0	0	1	36	0	165	36	201	19	124	0	143	344	380
PHF	0.48	n/a	0.6	0.63	0.25	n/a	n/a	0.25	0.64	n/a	0.96	0.53	0.85	0.53	0.7	n/a	0.76	0.91	0.9
4:00	4	0	1	5	0	0	0	0	5	0	51	5	56	1	40	0	41	97	102
4:15	6	1	4	11	0	0	0	0	11	0	59	8	67	2	46	0	48	115	126
4:30	9	0	10	19	1	0	1	2	21	0	49	7	56	4	29	1	34	90	111
4:45	9	0	2	11	2	0	0	2	13	0	42	6	48	4	42	2	48	96	109
5:00	10	1	7	18	1	0	2	3	21	0	33	4	37	8	51	4	63	100	121
5:15	10	0	5	15	1	0	1	2	17	0	36	3	39	4	40	2	46	85	102
5:30	10	1	3	14	0	0	0	0	14	0	33	5	38	2	39	0	41	79	93
5:45	7	0	4	11	1	0	0	1	12	1	41	3	45	2	34	1	37	82	94
4:15-5:15	34	2	23	59	4	0	3	7	66	0	183	25	208	18	168	7	193	401	467
PHF	0.85	0.5	0.58	0.78	0.5	n/a	0.38	0.58	0.79	n/a	0.78	0.78	0.78	0.56	0.82	0.44	0.77	0.87	0.93

DELICH ASSOCIATES
2272 GLEN HAVEN DRIVE
LOVELAND, CO 80538
Phone: (970) 669-2061

TABULAR SUMMARY OF VEHICLE COUNTS

Date: 8/17/2022 Observer: Vickie

Day: Wednesday Jurisdiction: Wellington/Larimer County

Intersection: LCR70/LCR7 North

R = right turn
S = straight
L = left turn

Time	Northbound:				Southbound: LCR5J				Total	Eastbound: LCR70				Westbound: LCR70				Total	Total
Begins	L	S	R	Total	L	S	R	Total	north/south	L	S	R	Total	L	S	R	Total	east/west	All
7:00				0	5		0	5	5	1	31		32		24	1	25	57	62
7:15				0	9		2	11	11	0	50		50		31	1	32	82	93
7:30				0	12		1	13	13	0	40		40		37	0	37	77	90
7:45				0	6		3	9	9	1	39		40		45	11	56	96	105
8:00				0	8		0	8	8	1	37		38		19	3	22	60	68
8:15				0	6		4	10	10	1	36		37		18	2	20	57	67
8:30				0	7		2	9	9	2	34		36		48	3	51	87	96
8:45				0	2		0	2	2	2	33		35		66	4	70	105	107
7:15-8:15	0	0	0	0	35	0	6	41	41	2	166	0	168	0	132	15	147	315	356
PHF	n/a	n/a	n/a	n/a	0.73	n/a	0.5	0.79	0.79	0.5	0.83	n/a	0.84	n/a	0.73	0.34	0.66	0.82	0.85
4:00				0	3		1	4	4	2	53		55		39	5	44	99	103
4:15				0	2		0	2	2	1	65		66		41	11	52	118	120
4:30				0	3		0	3	3	1	53		54		33	6	39	93	96
4:45				0	5		1	6	6	2	43		45		49	2	51	96	102
5:00				0	3		1	4	4	3	34		37		57	6	63	100	104
5:15				0	1		1	2	2	1	38		39		40	11	51	90	92
5:30				0	3		0	3	3	2	35		37		43	6	49	86	89
5:45				0	4		2	6	6	1	41		42		34	7	41	83	89
4:15-5:15	0	0	0	0	13	0	2	15	15	7	195	0	202	0	180	25	205	407	422
PHF	n/a	n/a	n/a	n/a	0.65	n/a	0.5	0.63	0.63	0.58	0.75	n/a	0.77	n/a	0.79	0.57	0.81	0.86	0.88

APPENDIX C

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	3	5	13	8	2	3	34	12	5	39	0
Future Vol, veh/h	1	3	5	13	8	2	3	34	12	5	39	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	3	6	14	9	2	3	38	13	6	43	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	111	112	43	111	106	45	43	0	0	51	0	0
Stage 1	55	55	-	51	51	-	-	-	-	-	-	-
Stage 2	56	57	-	60	55	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	867	778	1027	867	784	1025	1566	-	-	1555	-	-
Stage 1	957	849	-	962	852	-	-	-	-	-	-	-
Stage 2	956	847	-	951	849	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	854	773	1027	856	779	1025	1566	-	-	1555	-	-
Mov Cap-2 Maneuver	854	773	-	856	779	-	-	-	-	-	-	-
Stage 1	955	846	-	960	850	-	-	-	-	-	-	-
Stage 2	942	845	-	938	846	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9	9.4	0.4	0.8
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1566	-	-	907	839	1555	-	-
HCM Lane V/C Ratio	0.002	-	-	0.011	0.03	0.004	-	-
HCM Control Delay (s)	7.3	0	-	9	9.4	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	9	1	17	9	5	2	56	12	3	36	1
Future Vol, veh/h	1	9	1	17	9	5	2	56	12	3	36	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	10	1	18	10	5	2	61	13	3	39	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	125	124	40	123	118	68	40	0	0	74	0	0
Stage 1	46	46	-	72	72	-	-	-	-	-	-	-
Stage 2	79	78	-	51	46	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	849	766	1031	852	772	995	1570	-	-	1526	-	-
Stage 1	968	857	-	938	835	-	-	-	-	-	-	-
Stage 2	930	830	-	962	857	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	835	764	1031	841	770	995	1570	-	-	1526	-	-
Mov Cap-2 Maneuver	835	764	-	841	770	-	-	-	-	-	-	-
Stage 1	967	855	-	937	834	-	-	-	-	-	-	-
Stage 2	913	829	-	948	855	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.6	9.5	0.2	0.6
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1570	-	-	789	839	1526	-	-
HCM Lane V/C Ratio	0.001	-	-	0.015	0.04	0.002	-	-
HCM Control Delay (s)	7.3	0	-	9.6	9.5	7.4	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	165	36	19	124	0	23	0	12	1	0	0
Future Vol, veh/h	0	165	36	19	124	0	23	0	12	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	183	40	21	138	0	26	0	13	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	138	0	0	223	0	0	383	383	203	390	403	138
Stage 1	-	-	-	-	-	-	203	203	-	180	180	-
Stage 2	-	-	-	-	-	-	180	180	-	210	223	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1446	-	-	1346	-	-	575	550	838	569	536	910
Stage 1	-	-	-	-	-	-	799	733	-	822	750	-
Stage 2	-	-	-	-	-	-	822	750	-	792	719	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1446	-	-	1346	-	-	568	541	838	552	527	910
Mov Cap-2 Maneuver	-	-	-	-	-	-	568	541	-	552	527	-
Stage 1	-	-	-	-	-	-	799	733	-	822	737	-
Stage 2	-	-	-	-	-	-	808	737	-	779	719	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1	11	11.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	639	1446	-	-	1346	-	-	552
HCM Lane V/C Ratio	0.061	-	-	-	0.016	-	-	0.002
HCM Control Delay (s)	11	0	-	-	7.7	0	-	11.5
HCM Lane LOS	B	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	183	25	18	168	7	34	2	23	4	0	3
Future Vol, veh/h	0	183	25	18	168	7	34	2	23	4	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	199	27	20	183	8	37	2	25	4	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	191	0	0	226	0	0	442	444	213	453	453	187
Stage 1	-	-	-	-	-	-	213	213	-	227	227	-
Stage 2	-	-	-	-	-	-	229	231	-	226	226	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1383	-	-	1342	-	-	526	508	827	517	503	855
Stage 1	-	-	-	-	-	-	789	726	-	776	716	-
Stage 2	-	-	-	-	-	-	774	713	-	777	717	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1383	-	-	1342	-	-	517	499	827	493	494	855
Mov Cap-2 Maneuver	-	-	-	-	-	-	517	499	-	493	494	-
Stage 1	-	-	-	-	-	-	789	726	-	776	704	-
Stage 2	-	-	-	-	-	-	758	701	-	751	717	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.7	11.7	11.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	605	1383	-	-	1342	-	-	602
HCM Lane V/C Ratio	0.106	-	-	-	0.015	-	-	0.013
HCM Control Delay (s)	11.7	0	-	-	7.7	0	-	11.1
HCM Lane LOS	B	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	166	132	15	35	6
Future Vol, veh/h	2	166	132	15	35	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	184	147	17	39	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	164	0	-	0	344	156
Stage 1	-	-	-	-	156	-
Stage 2	-	-	-	-	188	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1414	-	-	-	652	890
Stage 1	-	-	-	-	872	-
Stage 2	-	-	-	-	844	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1414	-	-	-	651	890
Mov Cap-2 Maneuver	-	-	-	-	651	-
Stage 1	-	-	-	-	870	-
Stage 2	-	-	-	-	844	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1414	-	-	-	678
HCM Lane V/C Ratio	0.002	-	-	-	0.067
HCM Control Delay (s)	7.5	0	-	-	10.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	195	180	25	13	2
Future Vol, veh/h	7	195	180	25	13	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	212	196	27	14	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	223	0	-	0	438	210
Stage 1	-	-	-	-	210	-
Stage 2	-	-	-	-	228	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1346	-	-	-	576	830
Stage 1	-	-	-	-	825	-
Stage 2	-	-	-	-	810	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1346	-	-	-	572	830
Mov Cap-2 Maneuver	-	-	-	-	572	-
Stage 1	-	-	-	-	819	-
Stage 2	-	-	-	-	810	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	11.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1346	-	-	-	597
HCM Lane V/C Ratio	0.006	-	-	-	0.027
HCM Control Delay (s)	7.7	0	-	-	11.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

UNSIGNALIZED INTERSECTIONS

Level-of-Service	Average Total Delay sec/veh
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

Table 1-1
Motor Vehicle LOS Standards (Intersections)

Intersection Component	Major Intersection[1]	Minor Intersection[2]	Driveway
Overall	LOS C	LOS C	No Limit
Any Leg	LOS D	LOS D	No Limit
Any Movement	LOS E	LOS E	No Limit

[1] Includes all signalized and unsignalized arterial/arterial and arterial/major collector intersections.

[2] Includes all unsignalized intersections (except major intersections) and high volume driveways

[3] There are no LOS standards for the I-25 Interchange.

APPENDIX D

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	3	5	14	8	2	3	36	13	5	41	0
Future Vol, veh/h	1	3	5	14	8	2	3	36	13	5	41	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	3	6	16	9	2	3	40	14	6	46	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	117	118	46	116	111	47	46	0	0	54	0	0
Stage 1	58	58	-	53	53	-	-	-	-	-	-	-
Stage 2	59	60	-	63	58	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	859	772	1023	861	779	1022	1562	-	-	1551	-	-
Stage 1	954	847	-	960	851	-	-	-	-	-	-	-
Stage 2	953	845	-	948	847	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	846	767	1023	850	774	1022	1562	-	-	1551	-	-
Mov Cap-2 Maneuver	846	767	-	850	774	-	-	-	-	-	-	-
Stage 1	952	844	-	958	849	-	-	-	-	-	-	-
Stage 2	939	843	-	935	844	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9	9.5	0.4	0.8
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1562	-	-	902	834	1551	-	-
HCM Lane V/C Ratio	0.002	-	-	0.011	0.032	0.004	-	-
HCM Control Delay (s)	7.3	0	-	9	9.5	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	10	1	18	10	5	2	59	13	3	38	1
Future Vol, veh/h	1	10	1	18	10	5	2	59	13	3	38	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	11	1	20	11	5	2	64	14	3	41	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	131	130	42	129	123	71	42	0	0	78	0	0
Stage 1	48	48	-	75	75	-	-	-	-	-	-	-
Stage 2	83	82	-	54	48	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	841	761	1029	844	767	991	1567	-	-	1520	-	-
Stage 1	965	855	-	934	833	-	-	-	-	-	-	-
Stage 2	925	827	-	958	855	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	825	759	1029	832	765	991	1567	-	-	1520	-	-
Mov Cap-2 Maneuver	825	759	-	832	765	-	-	-	-	-	-	-
Stage 1	964	853	-	933	832	-	-	-	-	-	-	-
Stage 2	907	826	-	943	853	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.7	9.5	0.2	0.5
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1567	-	-	781	830	1520	-	-
HCM Lane V/C Ratio	0.001	-	-	0.017	0.043	0.002	-	-
HCM Control Delay (s)	7.3	0	-	9.7	9.5	7.4	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection

Int Delay, s/veh 2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	143	33	20	118	14	22	2	13	32	5	6
Future Vol, veh/h	2	143	33	20	118	14	22	2	13	32	5	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	250	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	159	37	22	131	16	24	2	14	36	6	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	147	0	0	196	0	0	372	373	178	373	383	139
Stage 1	-	-	-	-	-	-	182	182	-	183	183	-
Stage 2	-	-	-	-	-	-	190	191	-	190	200	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1435	-	-	1377	-	-	585	557	865	584	550	909
Stage 1	-	-	-	-	-	-	820	749	-	819	748	-
Stage 2	-	-	-	-	-	-	812	742	-	812	736	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1435	-	-	1377	-	-	569	548	865	565	541	909
Mov Cap-2 Maneuver	-	-	-	-	-	-	569	548	-	565	541	-
Stage 1	-	-	-	-	-	-	819	748	-	818	736	-
Stage 2	-	-	-	-	-	-	787	730	-	795	735	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1	11	11.6
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	645	1435	-	-	1377	-	-	593
HCM Lane V/C Ratio	0.064	0.002	-	-	0.016	-	-	0.081
HCM Control Delay (s)	11	7.5	-	-	7.7	-	-	11.6
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.3

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	183	24	19	159	22	32	4	27	12	2	2
Future Vol, veh/h	7	183	24	19	159	22	32	4	27	12	2	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	250	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	199	26	21	173	24	35	4	29	13	2	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	197	0	0	225	0	0	457	467	212	472	468	185
Stage 1	-	-	-	-	-	-	228	228	-	227	227	-
Stage 2	-	-	-	-	-	-	229	239	-	245	241	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1376	-	-	1344	-	-	514	493	828	502	493	857
Stage 1	-	-	-	-	-	-	775	715	-	776	716	-
Stage 2	-	-	-	-	-	-	774	708	-	759	706	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1376	-	-	1344	-	-	503	482	828	473	482	857
Mov Cap-2 Maneuver	-	-	-	-	-	-	503	482	-	473	482	-
Stage 1	-	-	-	-	-	-	770	711	-	771	705	-
Stage 2	-	-	-	-	-	-	758	697	-	723	702	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.7	11.7	12.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	603	1376	-	-	1344	-	-	502
HCM Lane V/C Ratio	0.114	0.006	-	-	0.015	-	-	0.035
HCM Control Delay (s)	11.7	7.6	-	-	7.7	-	-	12.4
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0.1

APPENDIX E

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	5	24	20	13	3	11	54	19	8	61	8
Future Vol, veh/h	26	5	24	20	13	3	11	54	19	8	61	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	6	27	22	14	3	12	60	21	9	68	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	194	196	73	202	190	71	77	0	0	81	0	0
Stage 1	91	91	-	95	95	-	-	-	-	-	-	-
Stage 2	103	105	-	107	95	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	765	699	989	756	705	991	1522	-	-	1517	-	-
Stage 1	916	820	-	912	816	-	-	-	-	-	-	-
Stage 2	903	808	-	898	816	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	743	689	989	723	695	991	1522	-	-	1517	-	-
Mov Cap-2 Maneuver	743	689	-	723	695	-	-	-	-	-	-	-
Stage 1	909	815	-	905	809	-	-	-	-	-	-	-
Stage 2	877	802	-	863	811	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.7	10.2	1	0.8
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1522	-	-	827	729	1517	-	-
HCM Lane V/C Ratio	0.008	-	-	0.074	0.055	0.006	-	-
HCM Control Delay (s)	7.4	-	-	9.7	10.2	7.4	-	-
HCM Lane LOS	A	-	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.2	0	-	-

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	14	13	27	14	8	22	88	19	5	57	30
Future Vol, veh/h	18	14	13	27	14	8	22	88	19	5	57	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	20	15	14	29	15	9	24	96	21	5	62	33

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	256	254	79	258	260	107	95	0	0	117	0	0
Stage 1	89	89	-	155	155	-	-	-	-	-	-	-
Stage 2	167	165	-	103	105	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	697	650	981	695	645	947	1499	-	-	1471	-	-
Stage 1	918	821	-	847	769	-	-	-	-	-	-	-
Stage 2	835	762	-	903	808	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	668	638	981	662	633	947	1499	-	-	1471	-	-
Mov Cap-2 Maneuver	668	638	-	662	633	-	-	-	-	-	-	-
Stage 1	903	819	-	833	757	-	-	-	-	-	-	-
Stage 2	798	750	-	870	806	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.3	10.7	1.3	0.4
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1499	-	-	724	687	1471	-	-
HCM Lane V/C Ratio	0.016	-	-	0.068	0.078	0.004	-	-
HCM Control Delay (s)	7.4	-	-	10.3	10.7	7.5	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.3	0	-	-

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	213	49	38	175	20	33	3	43	47	8	9
Future Vol, veh/h	3	213	49	38	175	20	33	3	43	47	8	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	250	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	237	54	42	194	22	37	3	48	52	9	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	216	0	0	291	0	0	569	570	264	585	586	205
Stage 1	-	-	-	-	-	-	270	270	-	289	289	-
Stage 2	-	-	-	-	-	-	299	300	-	296	297	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1354	-	-	1271	-	-	433	431	775	422	422	836
Stage 1	-	-	-	-	-	-	736	686	-	719	673	-
Stage 2	-	-	-	-	-	-	710	666	-	712	668	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1354	-	-	1271	-	-	410	416	775	383	407	836
Mov Cap-2 Maneuver	-	-	-	-	-	-	410	416	-	383	407	-
Stage 1	-	-	-	-	-	-	735	685	-	718	651	-
Stage 2	-	-	-	-	-	-	669	644	-	663	667	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.3	12.8	15.4
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	552	1354	-	-	1271	-	-	418
HCM Lane V/C Ratio	0.159	0.002	-	-	0.033	-	-	0.17
HCM Control Delay (s)	12.8	7.7	-	-	7.9	-	-	15.4
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.6	0	-	-	0.1	-	-	0.6

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	271	36	56	237	33	47	6	55	17	3	3
Future Vol, veh/h	11	271	36	56	237	33	47	6	55	17	3	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	250	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	295	39	61	258	36	51	7	60	18	3	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	294	0	0	334	0	0	740	755	315	770	756	276
Stage 1	-	-	-	-	-	-	339	339	-	398	398	-
Stage 2	-	-	-	-	-	-	401	416	-	372	358	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1268	-	-	1225	-	-	333	338	725	318	337	763
Stage 1	-	-	-	-	-	-	676	640	-	628	603	-
Stage 2	-	-	-	-	-	-	626	592	-	648	628	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1268	-	-	1225	-	-	314	318	725	274	317	763
Mov Cap-2 Maneuver	-	-	-	-	-	-	314	318	-	274	317	-
Stage 1	-	-	-	-	-	-	670	634	-	622	573	-
Stage 2	-	-	-	-	-	-	589	562	-	583	622	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	1.4	16.1	17.9
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	442	1268	-	-	1225	-	-	305
HCM Lane V/C Ratio	0.266	0.009	-	-	0.05	-	-	0.082
HCM Control Delay (s)	16.1	7.9	-	-	8.1	-	-	17.9
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	1.1	0	-	-	0.2	-	-	0.3

APPENDIX F

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	12	3	5	14	8	2	5	36	13	5	41	48
Future Vol, veh/h	12	3	5	14	8	2	5	36	13	5	41	48
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	92	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	3	6	16	9	2	6	40	14	6	46	53

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	150	151	73	148	170	47	99	0	0	54	0	0
Stage 1	85	85	-	59	59	-	-	-	-	-	-	-
Stage 2	65	66	-	89	111	-	-	-	-	-	-	-
Critical Hdwy	8.02	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	7.02	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.02	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	4.328	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	651	741	989	820	723	1022	1494	-	-	1551	-	-
Stage 1	741	824	-	953	846	-	-	-	-	-	-	-
Stage 2	762	840	-	918	804	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	639	735	989	808	717	1022	1494	-	-	1551	-	-
Mov Cap-2 Maneuver	639	735	-	808	717	-	-	-	-	-	-	-
Stage 1	738	821	-	949	843	-	-	-	-	-	-	-
Stage 2	749	837	-	906	801	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.2	9.7	0.7	0.4
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1494	-	-	716	788	1551	-	-
HCM Lane V/C Ratio	0.004	-	-	0.031	0.034	0.004	-	-
HCM Control Delay (s)	7.4	0	-	10.2	9.7	7.3	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection												
Int Delay, s/veh	4.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	49	10	1	18	10	5	2	59	13	3	38	12
Future Vol, veh/h	49	10	1	18	10	5	2	59	13	3	38	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	92
Mvmt Flow	53	11	1	20	11	5	2	64	14	3	41	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	137	136	48	135	135	71	54	0	0	78	0	0
Stage 1	54	54	-	75	75	-	-	-	-	-	-	-
Stage 2	83	82	-	60	60	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	834	755	1021	836	756	991	1551	-	-	1520	-	-
Stage 1	958	850	-	934	833	-	-	-	-	-	-	-
Stage 2	925	827	-	951	845	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	818	753	1021	824	754	991	1551	-	-	1520	-	-
Mov Cap-2 Maneuver	818	753	-	824	754	-	-	-	-	-	-	-
Stage 1	957	848	-	933	832	-	-	-	-	-	-	-
Stage 2	907	826	-	936	843	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.8	9.6	0.2	0.4
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1551	-	-	809	822	1520	-	-
HCM Lane V/C Ratio	0.001	-	-	0.081	0.044	0.002	-	-
HCM Control Delay (s)	7.3	0	-	9.8	9.6	7.4	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.1	0	-	-

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	143	33	68	118	14	22	2	24	32	5	6
Future Vol, veh/h	2	143	33	68	118	14	22	2	24	32	5	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	250	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	46	2	2	2
Mvmt Flow	2	159	37	76	131	16	24	2	27	36	6	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	147	0	0	196	0	0	480	481	178	487	491	139
Stage 1	-	-	-	-	-	-	182	182	-	291	291	-
Stage 2	-	-	-	-	-	-	298	299	-	196	200	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.66	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.714	3.518	4.018	3.318
Pot Cap-1 Maneuver	1435	-	-	1377	-	-	496	485	763	491	478	909
Stage 1	-	-	-	-	-	-	820	749	-	717	672	-
Stage 2	-	-	-	-	-	-	711	666	-	806	736	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1435	-	-	1377	-	-	467	458	763	452	451	909
Mov Cap-2 Maneuver	-	-	-	-	-	-	467	458	-	452	451	-
Stage 1	-	-	-	-	-	-	819	748	-	716	635	-
Stage 2	-	-	-	-	-	-	661	629	-	774	735	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	2.6	11.6	13.2
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	466	763	1435	-	-	1377	-	-	486
HCM Lane V/C Ratio	0.057	0.035	0.002	-	-	0.055	-	-	0.098
HCM Control Delay (s)	13.2	9.9	7.5	-	-	7.8	-	-	13.2
HCM Lane LOS	B	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0.1	0	-	-	0.2	-	-	0.3

Intersection												
Int Delay, s/veh	3.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	183	24	30	159	22	32	4	75	12	2	2
Future Vol, veh/h	7	183	24	30	159	22	32	4	75	12	2	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	250	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	58	2	2	2	2	2	2	2	2
Mvmt Flow	8	199	26	33	173	24	35	4	82	13	2	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	197	0	0	225	0	0	481	491	212	522	492	185
Stage 1	-	-	-	-	-	-	228	228	-	251	251	-
Stage 2	-	-	-	-	-	-	253	263	-	271	241	-
Critical Hdwy	4.12	-	-	4.68	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.722	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1376	-	-	1073	-	-	495	478	828	465	478	857
Stage 1	-	-	-	-	-	-	775	715	-	753	699	-
Stage 2	-	-	-	-	-	-	751	691	-	735	706	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1376	-	-	1073	-	-	478	460	828	405	460	857
Mov Cap-2 Maneuver	-	-	-	-	-	-	478	460	-	405	460	-
Stage 1	-	-	-	-	-	-	770	711	-	748	677	-
Stage 2	-	-	-	-	-	-	724	670	-	655	702	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.2	10.9	13.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	476	828	1376	-	-	1073	-	-	441
HCM Lane V/C Ratio	0.082	0.098	0.006	-	-	0.03	-	-	0.039
HCM Control Delay (s)	13.2	9.8	7.6	-	-	8.5	-	-	13.5
HCM Lane LOS	B	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0.3	0	-	-	0.1	-	-	0.1

Intersection	
Int Delay, s/veh	5.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	9	3	50	11	0	11
Future Vol, veh/h	9	3	50	11	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	100
Mvmt Flow	10	3	56	12	0	12

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	13	0	136	12
Stage 1	-	-	-	-	12	-
Stage 2	-	-	-	-	124	-
Critical Hdwy	-	-	4.12	-	6.42	7.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	4.2
Pot Cap-1 Maneuver	-	-	1606	-	857	843
Stage 1	-	-	-	-	1011	-
Stage 2	-	-	-	-	902	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1606	-	827	843
Mov Cap-2 Maneuver	-	-	-	-	827	-
Stage 1	-	-	-	-	1011	-
Stage 2	-	-	-	-	870	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6	9.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	843	-	-	1606	-
HCM Lane V/C Ratio	0.014	-	-	0.035	-
HCM Control Delay (s)	9.3	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0.1	-

Intersection	
Int Delay, s/veh	6.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	12	0	11	13	3	50
Future Vol, veh/h	12	0	11	13	3	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	100	2	2	2
Mvmt Flow	13	0	12	14	3	54

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	13	0	51	13
Stage 1	-	-	-	-	13	-
Stage 2	-	-	-	-	38	-
Critical Hdwy	-	-	5.1	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	3.1	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1146	-	958	1067
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	984	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1146	-	947	1067
Mov Cap-2 Maneuver	-	-	-	-	947	-
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	973	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.7	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1059	-	-	1146	-
HCM Lane V/C Ratio	0.054	-	-	0.01	-
HCM Control Delay (s)	8.6	-	-	8.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

APPENDIX G

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	37	5	24	20	13	3	13	54	19	8	61	56
Future Vol, veh/h	37	5	24	20	13	3	13	54	19	8	61	56
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	250	-	-	250	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	32	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	41	6	27	22	14	3	14	60	21	9	68	62

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	193	195	68	233	247	71	130	0	0	81	0	0
Stage 1	86	86	-	99	99	-	-	-	-	-	-	-
Stage 2	107	109	-	134	148	-	-	-	-	-	-	-
Critical Hdwy	7.42	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.42	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.42	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.788	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	705	700	995	722	655	991	1455	-	-	1517	-	-
Stage 1	853	824	-	907	813	-	-	-	-	-	-	-
Stage 2	830	805	-	869	775	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	682	689	995	690	645	991	1455	-	-	1517	-	-
Mov Cap-2 Maneuver	682	689	-	690	645	-	-	-	-	-	-	-
Stage 1	844	819	-	898	805	-	-	-	-	-	-	-
Stage 2	805	797	-	835	770	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.2	10.5	1.1	0.5
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1455	-	-	771	690	1517	-	-
HCM Lane V/C Ratio	0.01	-	-	0.095	0.058	0.006	-	-
HCM Control Delay (s)	7.5	-	-	10.2	10.5	7.4	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.2	0	-	-

Intersection												
Int Delay, s/veh	4.7											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	66	14	15	27	14	8	22	88	19	5	57	41
Future Vol, veh/h	66	14	15	27	14	8	22	88	19	5	57	41
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	250	-	-	250	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	29
Mvmt Flow	72	15	16	29	15	9	24	96	21	5	62	45

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	239	237	62	265	272	107	107	0	0	117	0	0
Stage 1	72	72	-	155	155	-	-	-	-	-	-	-
Stage 2	167	165	-	110	117	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	715	664	1003	688	635	947	1484	-	-	1471	-	-
Stage 1	938	835	-	847	769	-	-	-	-	-	-	-
Stage 2	835	762	-	895	799	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	685	651	1003	655	623	947	1484	-	-	1471	-	-
Mov Cap-2 Maneuver	685	651	-	655	623	-	-	-	-	-	-	-
Stage 1	923	832	-	833	757	-	-	-	-	-	-	-
Stage 2	798	750	-	861	797	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.9	10.8	1.3	0.4
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1484	-	-	715	679	1471	-	-
HCM Lane V/C Ratio	0.016	-	-	0.144	0.078	0.004	-	-
HCM Control Delay (s)	7.5	-	-	10.9	10.8	7.5	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0.3	0	-	-

Intersection												
Int Delay, s/veh	4.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	213	49	86	175	20	33	3	54	47	8	9
Future Vol, veh/h	3	213	49	86	175	20	33	3	54	47	8	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	250	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	5	2	2	2	2	28	2	2	2
Mvmt Flow	3	237	54	96	194	22	37	3	60	52	9	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	216	0	0	291	0	0	677	678	264	699	694	205
Stage 1	-	-	-	-	-	-	270	270	-	397	397	-
Stage 2	-	-	-	-	-	-	407	408	-	302	297	-
Critical Hdwy	4.12	-	-	4.15	-	-	7.12	6.52	6.48	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.245	-	-	3.518	4.018	3.552	3.518	4.018	3.318
Pot Cap-1 Maneuver	1354	-	-	1254	-	-	367	374	716	354	366	836
Stage 1	-	-	-	-	-	-	736	686	-	629	603	-
Stage 2	-	-	-	-	-	-	621	597	-	707	668	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1354	-	-	1254	-	-	334	344	716	303	337	836
Mov Cap-2 Maneuver	-	-	-	-	-	-	334	344	-	303	337	-
Stage 1	-	-	-	-	-	-	735	685	-	628	557	-
Stage 2	-	-	-	-	-	-	558	551	-	643	667	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	2.5	13.2	18.5
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	335	716	1354	-	-	1254	-	-	338
HCM Lane V/C Ratio	0.119	0.084	0.002	-	-	0.076	-	-	0.21
HCM Control Delay (s)	17.2	10.5	7.7	-	-	8.1	-	-	18.5
HCM Lane LOS	C	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.4	0.3	0	-	-	0.2	-	-	0.8

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	271	36	67	237	33	47	6	103	17	3	3
Future Vol, veh/h	11	271	36	67	237	33	47	6	103	17	3	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	250	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	18	2	2	2	2	2	2	2	2
Mvmt Flow	12	295	39	73	258	36	51	7	112	18	3	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	294	0	0	334	0	0	764	779	315	820	780	276
Stage 1	-	-	-	-	-	-	339	339	-	422	422	-
Stage 2	-	-	-	-	-	-	425	440	-	398	358	-
Critical Hdwy	4.12	-	-	4.28	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.362	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1268	-	-	1141	-	-	321	327	725	294	327	763
Stage 1	-	-	-	-	-	-	676	640	-	609	588	-
Stage 2	-	-	-	-	-	-	607	578	-	628	628	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1268	-	-	1141	-	-	299	303	725	231	303	763
Mov Cap-2 Maneuver	-	-	-	-	-	-	299	303	-	231	303	-
Stage 1	-	-	-	-	-	-	670	634	-	604	550	-
Stage 2	-	-	-	-	-	-	562	541	-	521	622	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	1.7	14	20.1
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	299	725	1268	-	-	1141	-	-	263
HCM Lane V/C Ratio	0.193	0.154	0.009	-	-	0.064	-	-	0.095
HCM Control Delay (s)	19.9	10.9	7.9	-	-	8.4	-	-	20.1
HCM Lane LOS	C	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.7	0.5	0	-	-	0.2	-	-	0.3

Intersection	
Int Delay, s/veh	3.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	55	3	50	32	0	11
Future Vol, veh/h	55	3	50	32	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	100
Mvmt Flow	61	3	56	36	0	12

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	64	0	211	63
Stage 1	-	-	-	-	63	-
Stage 2	-	-	-	-	148	-
Critical Hdwy	-	-	4.12	-	6.42	7.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	4.2
Pot Cap-1 Maneuver	-	-	1538	-	777	784
Stage 1	-	-	-	-	960	-
Stage 2	-	-	-	-	880	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1538	-	748	784
Mov Cap-2 Maneuver	-	-	-	-	748	-
Stage 1	-	-	-	-	960	-
Stage 2	-	-	-	-	847	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.5	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	784	-	-	1538	-
HCM Lane V/C Ratio	0.016	-	-	0.036	-
HCM Control Delay (s)	9.7	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0.1	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	45	0	11	66	3	50
Future Vol, veh/h	45	0	11	66	3	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	100	2	2	2
Mvmt Flow	49	0	12	72	3	54

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	49	0	145	49
Stage 1	-	-	-	-	49	-
Stage 2	-	-	-	-	96	-
Critical Hdwy	-	-	5.1	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	3.1	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1106	-	847	1020
Stage 1	-	-	-	-	973	-
Stage 2	-	-	-	-	928	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1106	-	838	1020
Mov Cap-2 Maneuver	-	-	-	-	838	-
Stage 1	-	-	-	-	973	-
Stage 2	-	-	-	-	918	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.2	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1008	-	-	1106	-
HCM Lane V/C Ratio	0.057	-	-	0.011	-
HCM Control Delay (s)	8.8	-	-	8.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

LARIMER COUNTY: HEALTH & ENVIRONMENT

AIR QUALITY

JUNE 5, 2023

Lea Schneider
Environmental Health Planner

REGULATORY AGENCIES

Environmental Protection Agency (EPA)

- Regulates the Clean Air Act
  - Sets National Ambient Air Quality Standards (NAAQS) for 6 criteria pollutants that have the potential to be harmful to human health and the environment.
  - National standards apply to all states and tribal areas

Colorado Air Pollution Control Division (APCD)

- Colorado's regulatory agency that oversees compliance with NAAQS.
  - Issue permits for sources of air pollution
  - Conduct inspections
  - Initiate compliance and enforcement actions

Larimer County Department of Health & Environment (LCDHE)

- LCDHE operates under a contract with APCD as a local regulatory agency for all of Larimer County's sources of air pollution.
  - Investigate complaints
  - Conduct inspections
  - Inspections conducted by LCDHE are reviewed by APCD's Compliance and Enforcement Program to determine appropriate enforcement actions.

EMISSION THRESHOLDS

	Calendar Year Uncontrolled Emissions in ATTAINMAENT Area		
Criteria Pollutants	**Air Pollutant Emission Notice (APEN)Thresholds**	**Permit Thresholds**	**EPA Thresholds for Major Sources**
VOC (volatile organic compounds)	2 tons	5 tons	100 tons
PM (particulate matter of various sizes)	2 tons	5 tons	100 tons
CO (carbon monoxide)	2 tons	10 tons	100 tons
SOx (sulfur dioxide)	2 tons	10 tons	250 tons
NOx (oxides of nitrogen)	2 tons	10 tons	100 tons
Noncriteria Pollutants **HAPs (Hazardous Air Pollutants)**	250 pounds	N/A	10 tons single source; or 25 tons combined

APCD PERMIT THRESHOLDS

Connell 2021 permit based on 300,000 tons per year

CRITERIA POLLUTANTS

Facility Equipment ID	AIRS Point	Tons per Year							Emission Type
		PM	PM_{10}	$PM_{2.5}$	NO_x	SO_2	VOC	CO	
650001	001	2.7	0.7	0.2	8.3	8.7	4.8	19.5	Point
	001	14.6	3.8	0.6	-	-	-	-	Fugitive

NONCRITERIA POLLUTANTS (HAZARDOUS AIR POLLUTANTS)

AIRS Point	Pollutant	CAS #	Uncontrolled Emission Rate (lb/yr)	Are the emissions reportable?	Controlled Emission Rate (lb/yr)
001	Acetaldehyde	75070	390	YES	390
	Hexane	110543	285.9	YES	285.9
	Formaldehyde	50000	930	YES	930
	Toluene	108883	870	YES	870

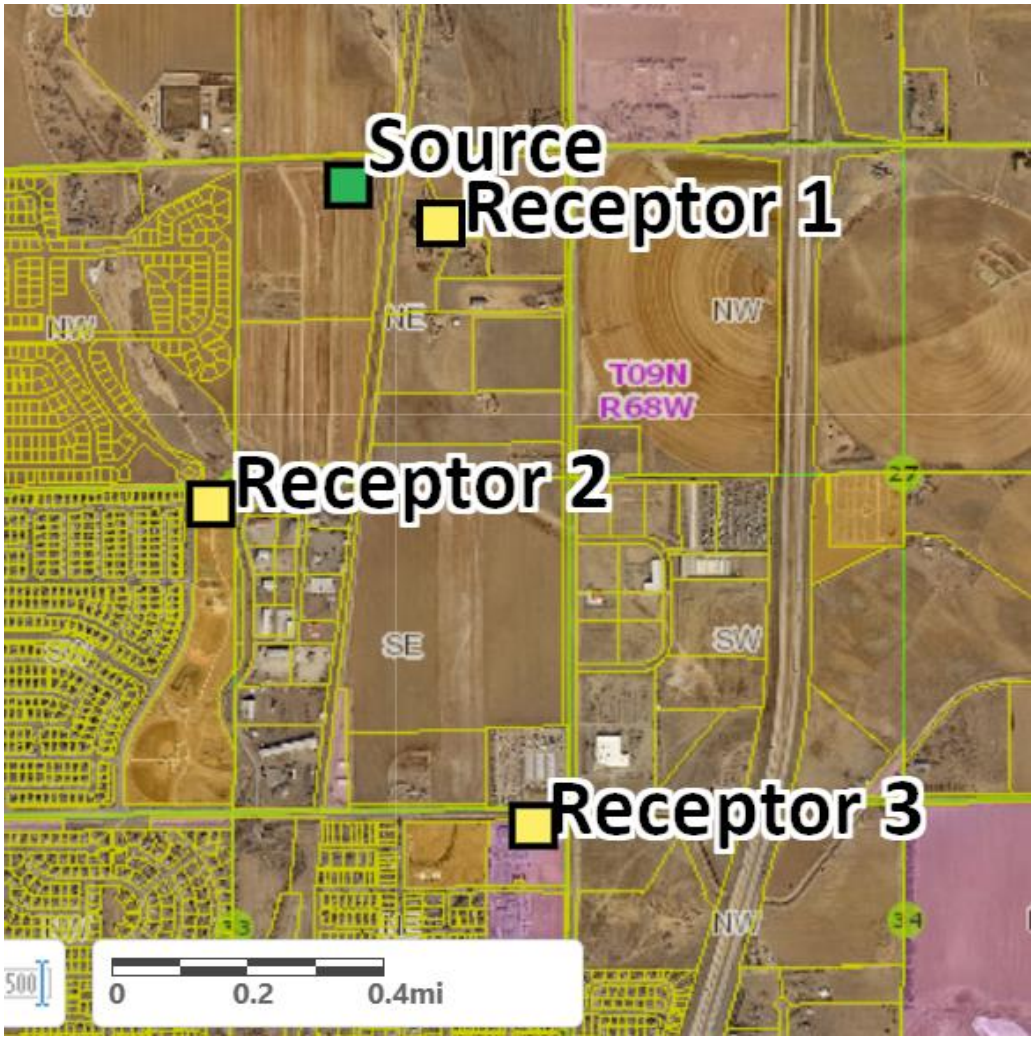
CONNELL 2023 RISK ASSESSMENT

- Connell contracted a consultant to conduct air dispersion modeling for criteria and noncriteria pollutants of Hazardous Air Pollutants/Air Toxics to evaluate community risk and determine if planned controls were adequate.

- Data for the modeling and risk assessment included the maximum pollutant emission rates from Connell's current 2021 permit, control equipment, local meteorology, etc.

- The air dispersion model for criteria pollutants and HAPs were determined to be below both the chronic and acute levels known to cause harmful health impacts under Federal and state screening values and health guideline values.

CONNELL 2023 RISK ASSESSMENT



- **Receptor 1: Residence**
- **Receptor 2: Community Park**
- **Receptor 3: Elementary School**

CONNELL 2023 RISK ASSESSMENT

Pollutant	Acute Screening Value (µg/m3)	CDPHE Recommended Screening Levels	Calculated 1-Hour Average HAP Exposure (µg/m3)		
			Receptor 1: Residential	Receptor 2: Park	Receptor 3: School
Acetaldehyde	470	45,040	0.17	0.241	0.03
Hexane	390,000	6,200	0.12	0.018	0.022
Formaldehyde	55	49	0.4	0.057	0.072
Toluene	37,000	7,500	0.37	0.054	0.068
Quinone	10000	4	0.035	0.005	0.0063
Benzene	1,300	29	0.036	0.0052	0.0065
Ethylbenzene	140,000	22,000	0.28	0.041	0.051
Xylene	8,700	8,700	0.35	0.05	0.063
Total PAH	0.75	0.03	0.03	0.0043	0.0054
Hydrochloric Acid	190	190	0.027	0.0039	0.0049

CONNELL 2023 RISK ASSESSMENT

Pollutant	Chronic Screening Value (µg/m3)	CDPHE Recommended Screening Levels	Calculated Annual Average HAP Exposure (µg/m3)		
			Receptor 1: Residential	Receptor 2: Park	Receptor 3: School
Acetaldehyde	0.45	4,504	0.0024	0.00026	0.00022
Hexane	70	700	0.0017	0.00021	0.00016
Formaldehyde	0.077	9.8	0.0056	0.00069	0.00053
Toluene	40	5,000	0.0053	0.00064	0.0005
Quinone	0.40	0.40	0.00049	0.00005	0.00005
Benzene	0.13	9.60	0.00051	0.00006	0.00005
Ethylbenzene	0.40	1,000	0.004	0.00044	0.00038
Xylene	10	100	0.0049	0.00054	0.00047
Total PAH	0.11	0.002	0.00042	0.00005	0.00004
Hydrochloric Acid	2	7.9	0.00038	0.00004	0.00004

CONNELL 2023 RISK ASSESSMENT

Health guideline values protect people because they are far below levels where we expect health effects.

COLORADO
Department of Public Health & Environment

AGENCY CONTACTS

Please call with questions or report concerns through the following agencies:

Larimer County Health Department: (970)498-6775
File complaint online: https://www.larimer.gov/health/environmental-health

Colorado Department of Public Health & the Environment: Toxicology
ToxCall: (303) 692-2606 or cdphe_toxcall@state.co.us

Colorado Environmental Incident Reporting Line at 1-877-518-5608
File complaint online:
https://cdphe.colorado.gov/report-a-public-health-or-environmental-concern

Addendum

May 1, 2023 Planning Commission Agenda Packet

This addendum to the May 1, 2023 Planning Commission agenda packet contains written public comments received before 3:00pm on April 28, 2023 that did not get included in the agenda packet published on April 28, 2023.

The agenda packet posted on April 28, 2023 is available for review on the Town's website at https://www.wellingtoncolorado.gov/Archive.aspx?AMID=56.

Print

Planning Commission May 1, 2023 Public Comment - Submission #3042

Date Submitted: 4/26/2023

First and Last Name*

Alyssa McGarvey

Email Address*

lissy.mcgarvey@gmail.com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

3948 Eucalyptus Street

Public Comment for the Planning Commission May 1, 2023 Meeting

I am opposed to the proposed asphalt plant in Wellington. The chemical and noise from the plant are enough for me to not want it here.

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Print

Planning Commission May 1, 2023 Public Comment - Submission #3043

Date Submitted: 4/26/2023

First and Last Name*

Erin

Email Address*

erin5mcguirk@outlook.com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

6992 Grassy Range Dr. Wellington, CO 80549

Public Comment for the Planning Commission May 1, 2023 Meeting

We do not want the Asphalt Plant here in Wellington so close to where my son attends school. We do not want to be exposed to such harsh chemicals. Air quality is already an issue.

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Print

Planning Commission May 1, 2023 Public Comment - Submission #3044

Date Submitted: 4/26/2023

First and Last Name*

paul d Wakefield

Email Address*

pdwfield@yahoo.com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

8912 Smoke Signal Way

Public Comment for the Planning Commission May 1, 2023 Meeting

This is in regards to the Asphalt plant meeting on may 1st. I have uploaded copies of three recent Asphalt plant accidents. Please review them for consideration to oppose the approval of the asphalt plant north of Buffalo Creek subdivision. 1. The Superior, Wi accident affected thirty six residents and eleven employees. People were evacuated up to 10 miles away. 2. The Ardmore asphalt explosion left one employee dead where they store a lot of volatile chemicals. 3. Tank explodes at asphalt plant in ADAMS COUNTY as a result of an electrical fire. Lastly, my other concern is: How is the Wellington fire department, the town of Wellington and Larimer county prepared to respond to such accidents?

Optional File Attachment

Ardmore asphalt plant.docx

Optional File Attachment

Tank explodes at asphalt plant 11.docx

Optional File Attachment

United Asphalts plant in Commerce.docx

Tank explodes at asphalt plant

ADAMS COUNTY – Southwest Adams County Fire and Rescue says an asphalt tank at Lafarge exploded Monday morning.

No one was hurt and the damage was minimal. A wooden deck on top of the tank and the motor was damaged.

Fire Chief George Ditolla says the cause of the explosion is still under investigation although it appears to be electrical in nature.

Author: **ColleenLocke** Published: **8/6/2007 1:38:59 PM Retrieved April 26, 2023 from https://www.9news.com/article/news/local/tank-explodes-at-asphalt-plant/73-343730236**

Author: ColleenLocke
Published: 8/6/2007 1:38:59 PM
Updated: 1:38 PM MDT August 6, 2007

No one was hurt and the damage was minimal. A wooden deck on top of the tank and the motor was damaged.

Fire Chief George Ditolla says the cause of the explosion is still under investigation although it appears to be electrical in nature.

NEXT UP IN 5

Property values jump 35% to 45% in 9 counties across Denver metro area

Yosemite closing for several days due to flooding

IN OTHER NEWS

Extended headlines and weather for Wednesday evening

COMMERCE CITY, Colo. -- Fire officials say an asphalt tank caught fire at the United Asphalts plant in Commerce City this morning.

A witness told Denver7 there was an explosion.

Gregg Vest, was working security detail at a nearby business when he heard a loud boom, ran outside and saw smoke coming from one of the tanks at the asphalt plant at 4306 E. 60th Avenue.

"I called 911," he said.

Vest, snapped several photos of the black smoke emanating from the plant site.

Vest said he saw a crew member on a fork lift trying to control the blaze with a fire extinguisher.

An Adams County Fire Department spokesperson said the fire broke out around 11:25 a.m. as the crew tried to heat the tank "to get the right consistency."

There were no injuries.

Denver 7 news 2023 Scripps Media, Inc. Retrieved April 26, 2023 from https://www.denver7.com/news/local-news/asphalt-tank-catches-fire-explodes-in-commerce-city

One dead after explosion at Ardmore asphalt plant

Friday, July 16th 2021, 10:50 AM CDT
Updated:
Friday, July 16th 2021, 6:38 PM CDT
By **Lexy French**

ARDMORE, Okla. (KTEN) -- One person was killed after an explosion and fire at an Ardmore asphalt plant on Friday morning.

Ardmore police Chief Kevin Norris said they began receiving calls around 10 a.m. concerning the blast at Asphalt Express Enterprises at 415 North Plainview Road on the city's west side, not far from the Michelin tire plant.

"Firefighters arrived on the scene and found heavy flames and smoke coming from the back of the compound ... where they stored a lot of their volatile chemicals," said Ardmore Fire Department spokesperson Jason Woydziak.

Thick black smoke rose from the scene and could be seen for miles around.

Norris confirmed that one person died in the blast; no identity was released. The chief said no one else was injured.

"We don't know what the cause of the fire is," Chief Norris said. "Right now that is under investigation, and then OSHA will come in and do an investigation."

He said it may be several months before the origin of the blast can be identified.

Concerned family members of employees were asked to meet officers stationed nearby at the car wash at Broadway and Plainview Road for help in contacting loved ones.

The fire was reported under control as of 12:45 p.m.

Phone calls to the company by the AP rang unanswered on Friday and neither the fire department nor emergency services immediately replied to messages seeking comment.

According to its website, Asphalt Express provides transportation, storage and sales of bulk liquids such as asphalt and various types of oil at the Ardmore plant.

Retrieved April 26, 2023, from 10 news Okla. **By Lexy French**

https://www.kten.com/story/44324469/fire-breaks-out-at-ardmore-asphalt-facility

Print

Planning Commission May 1, 2023 Public Comment - Submission #3045

Date Submitted: 4/26/2023

First and Last Name*

Joe Hayes

Email Address*

diverhayes@yahoo.com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

3328 Wild West lane wellington 80549

Public Comment for the Planning Commission May 1, 2023 Meeting

We are trying to work together as a city to fight hidden things, power and greed. We feel that the city employees are trying to sneak something into the town without letting us know about it. Luckily one of our neighbors found out about it, and notified us. We encourage more people to get involved and are asking that the truth be known that they are Toxic chemicals coming from the asphalt plant. This is not what the Connell companies representative presented to us and tried to say â€œ only steam comes out no chemicals, no more than a gas stationâ€. There is Also evidence that Connell has been out of compliance in the past & was fined $7k via a Settlement Agreement with the CDC. We didnâ€™t move here to be pushed out by greedy people who want to sell their families land that used to be a farm for millions of dollars to be an asphalt plant instead and right next to where our children go to play.

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Print

Planning Commission May 1, 2023 Public Comment - Submission #3046

Date Submitted: 4/26/2023

First and Last Name*

Larry M. Rice

Email Address*

larryriceoc1@gmail.com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

9073 Flaming Arrow Avenue

Public Comment for the Planning Commission May 1, 2023 Meeting

Dear Mr. Bird, Simply and to the point, I am a Wellington resident who resides and owns a home in Buffalo Creek subdivision, located to the west of the proposed Hot Asphalt Plant that is being considered for construction behind Wellington Community Park. I want to express in the strongest means possible that I oppose any such development in our community! Why? In plain terms that anyone can understand: IT STINKS! The smell, full of toxic gases and emissions. The eyesore (really, does anyone want to look out and see this ugly construction site?). The increase in heavy truck traffic within our town (as if we need any MORE traffic). The reduction in property values (who would like to have their home situated downwind of the asphalt fumes?). Noise pollution (yes, there are residents of Wellington who appreciate its small-town tranquility). And why is this hot asphalt plan even being considered to be located in Wellington? Hmmmâ€¦.letâ€™s think about that for a second. Money? Greed? Short-sighted, ill-informed thinking? All of the above? I think â€œall of the above.â€ I implore you, Mr. Bird, and the rest of the town trustees, including the mayor, to stop this ill-conceived idea from going any further. Do NOT allow this asphalt plan to be situated anywhere within Wellington. Not only for us current residents, but for those who might want to call Wellington their home in the future. Itâ€™s just a plain bad idea that should have never have been considered in the first place. Itâ€™s time to stop it now. Wellington does not need it. We do not need it! Thanks you for your time and consideration. Please do the right thing. Sincerely, Larry Rice Buffalo Creek Estates Sent from my iPhone

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Print

Planning Commission May 1, 2023 Public Comment - Submission #3047

Date Submitted: 4/26/2023

First and Last Name*

Robby Oxford

Email Address*

jessicaoxford10@yahoo.com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

6902 Grassy Range Dr.

Public Comment for the Planning Commission May 1, 2023 Meeting

To whom it may concern, We are all about growth and prosperity for our town, however allowing a large, toxic, company such as an asphalt plant to move in brings a lot of negative effects to our community. Some of these negatives include unwanted traffic, as well as all the health risks that it would bring, including breathing in toxic chemicals and potential water contamination in already questionable water, etc... The smell is just another negative aspect to add to this list of reasons why a plant does not belong here. I don't usually speak up, but this is a concern in which myself and many others do not agree with. We should not be allowing this to happen to our town. Thank you for your time and consideration of our opinion.

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Print

Planning Commission May 1, 2023 Public Comment - Submission #3048

Date Submitted: 4/26/2023

First and Last Name*

Lorene Simpson

Email Address*

Lrsimpson25@gmail

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

6915 Grassy Range Dr

Public Comment for the Planning Commission May 1, 2023 Meeting

As a new homeowner in the state of Colorado and Wellington, I would like to express my concern over the Cornell asphalt plan and its toxic chemicals. It cannot be located at the proposed location due to the set back requirements of 2640 feet from any residential district, school, medical facility or religious area. DO NOT APPROVE THIS PLAN as the plant produces and curates toxic chemicals. Thank you for taking the property owners concern. Lorene Simpson

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Print

Planning Commission May 1, 2023 Public Comment - Submission #3049

Date Submitted: 4/26/2023

First and Last Name*

Nathan Schmidt

Email Address*

nds.schmidt@gmail.com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

3233 Grizzly Way Wellington Co

Public Comment for the Planning Commission May 1, 2023 Meeting

I have lived in Wellington for six years, and we are wanting to start a family soon, putting an asphalt plant near our neighborhood (Buffalo Creek) would cause health issues for us, as well as drastically lower the value of our house. If we want this city to continue to grow, we cannot put a toxic and loud commercial enterprise so close to our neighborhoods, schools, and playgrounds. Please use some common sense and do not allow the asphalt plant to be built in such close proximity to the city. Think 10-20 years from now and what would be in the best interest of the city and for the people that call this place home.

Optional File Attachment

Choose File | No file selected

Optional File Attachment

Choose File | No file selected

Optional File Attachment

Choose File | No file selected

Print

Planning Commission May 1, 2023 Public Comment - Submission #3050

Date Submitted: 4/26/2023

First and Last Name*

Jennieann West

Email Address*

jennieann9378@gmail.com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

3294 Wild West Ln. Wellington, CO

Public Comment for the Planning Commission May 1, 2023 Meeting

OPPOSED to proposed asphalt plant. Please do not ruin our beautiful community of Buffalo Creek and the community park with a plant this close to our houses and playground for our children.

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Print

Planning Commission May 1, 2023 Public Comment - Submission #3051

Date Submitted: 4/26/2023

First and Last Name*

Chad Mickschl

Email Address*

chad.guides@gmail.com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

6915 Grassy Range Dr

Public Comment for the Planning Commission May 1, 2023 Meeting

I am against the decision to approve the Asphalt Plat from being built at the current location within Wellington town limits. 1.Â The town of Wellington was re-zoned in 2022 with the land that Connell Resources Â wants to develop zoned as Heavy Industrial.Â As Wellington was re-zoned, Heavy Industrial land came with setback requirements of 1000ft linear and 45ft height restrictions.Â The claim by Connell Resources that the land is not suitable for Heavy Industrial use with current setbacks should have led town planners to decide that this property should be re-zoned to Light Industrial to limit the setback needs.Â The need for a greater setback of 2640ft is actually more appropriate given the language in the Land Use Code Section 4.03.21 B curating toxic chemicals.Â Especially since it is adjacent to a residential neighborhood, a park and school.Â Additionally, the asphalt plant will not only impact the nearby neighborhoods, but our entire small town as the air quality will be impacted. 2.Â I have issues with the lack of informed decision making to grant the setback variance as well.Â It does not appear the town of Wellington has done any environmental (air quality, water quality and quantity, soil erosion), traffic impact, view shed impacts, noise, environmental justice for underserved communities, or economic impacts analyses that this will have on the health and safety of Wellington residents and wildlife such as migrating birds.Â The town must clearly understand and communicate to the public, the risks and/or benefits associated with the Asphalt Plant. This has yet to have been completed. Â Based on other locations where Asphalt Plants are located near neighborhoods, property values decreased 56% according to Blue Ridge Environmental Defense League (BREDL). BREDL also found that 45% of residents living within a half mile of a new asphalt plant reported a deterioration of their health, which began after the plant opened. Known toxins also come with an Asphalt Plant such as odor, formaldehyde, hexane, phenol, polycyclic organic matter, and toluene. The CDCâ€™s National Institute for Occupational Safety & Health states, â€œKnown carcinogens have been found in asphalt fumes generated at work sites.â€* Exposure to these air toxins may cause cancer, central nervous system problems, liver damage, respiratory problems, and skin irritation (EPA Asphalt Plant Emission Assessment Report 2000). The town of Wellington has a number of human health and safety issues to deal with currently, they do not need to add another issue. The responsibility of the Town of Wellington and its elected representatives is the health, safety, and well being of its residents.Â If this asphalt plant is approved, the town is falling far short of this responsibility. Â 3.Â The economic impact on the residents and the town will be noticeable.Â Residents will lose property value and will likely look to move out of town.Â With issues Wellington is already trying to deal with (train crossings, water quality, water price, concentrated feed lots, close proximity to the highway), this will likely be the final thing to tilt residents to leave.Â Businesses will also likely leave and close as their consumers will leave town. Â 4.Â There are certainly better locations for the Asphalt Plant to be located.Â Connell Resources likes to mention that homes have been built in Fort Collins next to their plants, however that is a homeowners decision.Â With this approval, homeowners were not able to make a decision to live next to an Asphalt Plant, the town of Wellington is poorly making that decision for them.Â As elected officials, you must stand up for your constituents. There are large swaths of county land in Larmier and Weld where this could be located away from residential areas.Â Connell Resources claims that the counties don't want the Asphalt Plants, but there is a process to get those approved there.Â There are also areas within Weld County where these plants are welcomed. Connell Resources also claimed that they could open in Carr (where they get their aggregate) but its too cold and windy for transporting?Â There are common mitigations such as lining and insulating trucks for transport.Â Asphalt plants exist in far colder places than the Front Range of Colorado. It's time for the town of Wellington to STOP being Fort Collins' dumping ground. Thank you for taking comments and I trust the right decision will be made regarding the health, safety, and viability of residents and the town of Wellington. Chad Mickschl

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Print

Planning Commission May 1, 2023 Public Comment - Submission #3054

Date Submitted: 4/27/2023

First and Last Name*

Jessica R Howe

Email Address*

colacinoj@yahoo.com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

8802 Raging Bull Lane

Public Comment for the Planning Commission May 1, 2023 Meeting

I have COPD and a history of breast cancer. Having an asphalt company in town will exacerbate by COPD and I wonâ€™t be able to live here. I cannot afford to move. We are highly against this plant being built here due to health concerns. Thank you

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Print

Planning Commission May 1, 2023 Public Comment - Submission #3055

Date Submitted: 4/27/2023

First and Last Name*

Aaron Hackett

Email Address*

aaron.e.hackett@gmail.com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

3337 Grizzly Way

Public Comment for the Planning Commission May 1, 2023 Meeting

Town of Wellington Planning Commission, I am extremely opposed to the proposed Asphalt Plant. I have a home that would be very close to this plant and I am very worried about chemical exposure, associated health impacts, noise pollution, and loss of property value. My wife is pregnant and as a parent-to-be I am appalled at the idea of raising my child near such a toxic industrial facility. The idea of putting an asphalt plant right in the center of a residential area when there are literally thousands of open acres near enough to be of no economic detriment is quite frankly one of the most ludicrous proposals I have ever heard. There is absolutely no reason to expose large numbers of children, mothers, and elderly individuals to the toxic fumes an asphalt plant would produce. The town, county, and state recently spent an extremely large sum of money building a new school that would be in the near vicinity to this proposed plant and therefore expose all the students, staff, and parents to these fumes. A simple solution to my and other's concerns would be to relocate the proposed plant to a significantly less populated area north or east of town. Aaron Hackett

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Print

Planning Commission May 1, 2023 Public Comment - Submission #3056

Date Submitted: 4/27/2023

First and Last Name*

Trevor Vilkaitis

Email Address*

tvilkaitis@hotmail.com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

3282 Grizzly Way

Public Comment for the Planning Commission May 1, 2023 Meeting

To whom it may concern, In regards to the proposed asphalt plant, I strongly oppose the decision to allow the plant to be near Wellington. As a resident and homeowner in the Buffalo creek subdivision this will directly effect me and my family. Not only will my home value be compromised, but the pollution and health effects on me, my children and my animals is unacceptable. Also, Wellington is already on an infrastructure system that has been spread thin for years. For years now we have been on water restrictions, constant power outages and the traffic at peak times such as school start and finish times is already an issue. This area is not capable of supporting what is already here plus any industrial plant of any kind. Please take these concerns into consideration when discussing this asphalt plant near Wellington. Thank you.

Optional File Attachment

Choose File | No file selected

Optional File Attachment

Choose File | No file selected

Optional File Attachment

Choose File | No file selected

Print

Planning Commission May 1, 2023 Public Comment - Submission #3057

Date Submitted: 4/27/2023

First and Last Name*

Ben Leistikow

Email Address*

ben.leistikow@me.com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

8605 Citation Ct, Wellington

Public Comment for the Planning Commission May 1, 2023 Meeting

Dear Planning Board, The intent of this letter is that the Connell site plan doesnâ€™t meet the stringent requirements that apply to toxic chemicals and so cannot be located at the proposed location nor does a continuance for air modeling help with this. Land use code 4.03.21,B, regarding the production and curating of toxic chemicals requires these sites to be located at least 2,640 feet from any residential district, religious land use, medical care facility, or school. Batch asphalt plants produce toxic chemicals in the forms of HAPs and PAHs. Colorado Department of Public Health & Environment refer to these chemicals as toxic in their documentation. Additionally Lea Schneider from Larimer County Department of Public Health & Environment was quoted in the Coloradoan and at the previous meeting referring to these chemicals as toxic. John Warren also referenced these chemicals as toxic at major source levels. The code does not care about levels it only refers to if there are toxic chemicals. This batch asphalt plant produces and curates toxic chemicals. The planning board should not approve this plan due to the producing and curating setback of 2,640 feet. There is no variance for this setback. Thanks for your consideration, Ben Leistikow

Optional File Attachment

Proposed Wellington asphalt plant approval delayed.pdf

Optional File Attachment

This fact sheet answers.pdf

Optional File Attachment

PAH FAQ.pdf

Polycyclic Aromatic Hydrocarbons (PAHs) - ToxFAQs™

This fact sheet answers the most frequently asked health questions (FAQs) about polycyclic aromatic hydrocarbons (PAHs). For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to polycyclic aromatic hydrocarbons usually occurs by breathing air contaminated by wild fires or coal tar, or by eating foods that have been grilled. PAHs have been found in at least 600 of the 1,430 National Priorities List (NPL) sites identified by the Environmental Protection Agency (EPA).

What are polycyclic aromatic hydrocarbons?

(Pronounced pŏl′ī-sī′klĭk ăr′ə-măt′ĭk hī′drə-kar′bənz)

Polycyclic aromatic hydrocarbons (PAHs) are a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat. PAHs are usually found as a mixture containing two or more of these compounds, such as soot.

Some PAHs are manufactured. These pure PAHs usually exist as colorless, white, or pale yellow-green solids. PAHs are found in coal tar, crude oil, creosote, and roofing tar, but a few are used in medicines or to make dyes, plastics, and pesticides.

What happens to PAHs when they enter the environment?

- PAHs enter the air mostly as releases from volcanoes, forest fires, burning coal, and automobile exhaust.
- PAHs can occur in air attached to dust particles.
- Some PAH particles can readily evaporate into the air from soil or surface waters.
- PAHs can break down by reacting with sunlight and other chemicals in the air, over a period of days to weeks.
- PAHs enter water through discharges from industrial and wastewater treatment plants.
- Most PAHs do not dissolve easily in water. They stick to solid particles and settle to the bottoms of lakes or rivers.
- Microorganisms can break down PAHs in soil or water after a period of weeks to months.
- In soils, PAHs are most likely to stick tightly to particles; certain PAHs move through soil to contaminate underground water.
- PAH contents of plants and animals may be much higher than PAH contents of soil or water in which they live.

How might I be exposed to PAHs?

- Breathing air containing PAHs in the workplace of coking, coal-tar, and asphalt production plants; smokehouses; and municipal trash incineration facilities.
- Breathing air containing PAHs from cigarette smoke, wood smoke, vehicle exhausts, asphalt roads, or agricultural burn smoke.
- Coming in contact with air, water, or soil near hazardous waste sites.
- Eating grilled or charred meats; contaminated cereals, flour, bread, vegetables, fruits, meats; and processed or pickled foods.
- Drinking contaminated water or cow's milk.
- Nursing infants of mothers living near hazardous waste sites may be exposed to PAHs through their mother's milk.

Agency for Toxic Substances and Disease Registry
Division of Toxicology and Human Health Sciences
ATSDR
CS265956-A

Polycyclic Aromatic Hydrocarbons

How can PAHs affect my health?

Mice that were fed high levels of one PAH during pregnancy had difficulty reproducing and so did their offspring. These offspring also had higher rates of birth defects and lower body weights. It is not known whether these effects occur in people.

Animal studies have also shown that PAHs can cause harmful effects on the skin, body fluids, and ability to fight disease after both short- and long-term exposure. But these effects have not been seen in people.

How likely are PAHs to cause cancer?

The Department of Health and Human Services (DHHS) has determined that some PAHs may reasonably be expected to be carcinogens.

Some people who have breathed or touched mixtures of PAHs and other chemicals for long periods of time have developed cancer. Some PAHs have caused cancer in laboratory animals when they breathed air containing them (lung cancer), ingested them in food (stomach cancer), or had them applied to their skin (skin cancer).

Is there a medical test to show whether I've been exposed to PAHs?

In the body, PAHs are changed into chemicals that can attach to substances within the body. There are special tests that can detect PAHs attached to these substances in body tissues or blood. However, these tests cannot tell whether any health effects will occur or find out the extent or source of your exposure to the PAHs. The tests aren't usually available in your doctor's office because special equipment is needed to conduct them.

Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) has set a limit of 0.2 milligrams of PAHs per cubic meter of air (0.2 mg/m^3). The OSHA Permissible Exposure Limit (PEL) for mineral oil mist that contains PAHs is 5 mg/m^3 averaged over an 8-hour exposure period.

The National Institute for Occupational Safety and Health (NIOSH) recommends that the average workplace air levels for coal tar products not exceed 0.1 mg/m^3 for a 10-hour workday, within a 40-hour workweek. There are other limits for workplace exposure for things that contain PAHs, such as coal, coal tar, and mineral oil.

Glossary

Carcinogen: A substance that can cause cancer.

Ingest: Take food or drink into your body.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for polycyclic aromatic hydrocarbons. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636.

ToxFAQs™ Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Coloradoan.

BUSINESS

Approval of asphalt plant in Wellington put on hold for more air quality data

Pat Ferrier
Fort Collins Coloradoan

Published 11:03 a.m. MT March 7, 2023 | **Updated 12:33 p.m. MT March 7, 2023**

Wellington's planning commission delayed a decision about a new asphalt plant in north Wellington to get more information on what level of toxins, if any, are dispersed into the air.

During a four-hour hearing, residents living near the proposed Connell asphalt plant at 3548 E. County Road 66 voiced concerns about air pollution, noise and truck traffic the plant may generate. The plant would mix asphalt for use in roads and highways.

The site is in an industrial zone on a lot south of County Road 66 between North County Road 7 and North County Road 9, adjacent to Buffalo Creek subdivision and the undeveloped Sundance subdivision.

Connell Resources' current plant, which is nearing the end of its lifespan, is just south of the Harmony Road and Interstate 25 intersection in Timnath. Connell plans to close the plant and redevelop it as a commercial and residential project, including a potential Topgolf entertainment center.

The planning commission is the last approval Connell needs before it can apply for a building permit. The Wellington Board of Adjustments approved two variances for the plant in October, including allowing a 70-foot silo and an 800-foot buffer from residential areas.

Wellington's land use code limits heights in the industrial zone to 45 feet and requires a 1,000-foot buffer from neighborhoods.

Flooded with last-minute emails and in-person comments from neighbors questioning the levels of benzene, formaldehyde and other toxins that could be emitted from the plant, commissioners stepped on the brakes, asking town planners to find additional resources and data to help them sort through conflicting information.

"Are there going to be toxic chemicals emitted at this plant?" Commissioner Lowrey Moyer asked. "Is the 800-foot buffer enough? Are our kids going to be OK? As a resident with four kids, I want to know."

Lea Schneider, an environmental health planner with Larimer County, said the plant does produce air toxics — pollutants that are known or suspected to cause cancer or other serious health effects — but the concentrations depend on production levels and equipment.

An analysis of potential air toxics at a larger asphalt plant near the Poudre Trail in Fort Collins had emissions that were within acceptable levels even for the closest neighbor and at the trailhead, she said. "But each asphalt plant is individual. Air dispersion modeling will be a huge asset to evaluate what needs to be done to protect the community if this is approved."

Wellington's land use code and the state require the plant to be tested regularly for air pollutants.

John Warren, president of Connell Resources, said that in 2002 the Environmental Protection Agency removed asphalt plants from its list of major sources of hazardous air pollution under the Clean Air Act and concluded asphalt plants do not have the potential to emit hazardous air pollution approaching major source levels.

Connell will comply with all emission regulations, but emissions coming from the plant are similar to emissions from everyday sources, he said. "It's a misnomer that's what coming out of the stack is asphalt fumes," he said. "It's steam coming off the natural gas used to

heat aggregates. We use a lot of natural gas, but (the emissions) are no different from what's coming off the furnace at your house."

A report from Sanborn, Head & Associates of Denver reported in an emissions comparison report that the benzene emissions from the combustion of fuel are equivalent to a single gas station or single fast-food restaurant in a year. In a letter sent to commissioners, resident Katie Meyer urged the board to require a 2,640-foot setback, which the Wellington land use code recommends for heavy industrial and manufacturing uses.

"The town has due diligence to find the correct unbiased research and data to make sure the land use code is properly followed," she wrote.

Jason Waldo, whose family has owned the property next door for 45 years, said Connell has addressed his family's concerns. "As a family, we feel this is a good opportunity to have a quality ... company as neighbors."

The property has been zoned industrial for years, and given that the asphalt plant will operate seasonally, from about April to November, Waldo said his family supports the project.

About the proposed Connell Resources asphalt plant in Wellington

Acres: 35
Estimated number of truck trips during production season: 50 to 60 per day
Operating hours/months: 7 a.m. to 5 or 6 p.m., April through November
Employees: 35

Polycyclic Aromatic Hydrocarbons (PAHs) - ToxFAQs™

This fact sheet answers the most frequently asked health questions (FAQs) about polycyclic aromatic hydrocarbons (PAHs). For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to polycyclic aromatic hydrocarbons usually occurs by breathing air contaminated by wild fires or coal tar, or by eating foods that have been grilled. PAHs have been found in at least 600 of the 1,430 National Priorities List (NPL) sites identified by the Environmental Protection Agency (EPA).

What are polycyclic aromatic hydrocarbons?

(Pronounced pŏl′ī-sī′klĭk ăr′ə-măt′ĭk hī′drə-kar′bənz)

Polycyclic aromatic hydrocarbons (PAHs) are a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat. PAHs are usually found as a mixture containing two or more of these compounds, such as soot.

Some PAHs are manufactured. These pure PAHs usually exist as colorless, white, or pale yellow-green solids. PAHs are found in coal tar, crude oil, creosote, and roofing tar, but a few are used in medicines or to make dyes, plastics, and pesticides.

What happens to PAHs when they enter the environment?

- PAHs enter the air mostly as releases from volcanoes, forest fires, burning coal, and automobile exhaust.
- PAHs can occur in air attached to dust particles.
- Some PAH particles can readily evaporate into the air from soil or surface waters.
- PAHs can break down by reacting with sunlight and other chemicals in the air, over a period of days to weeks.
- PAHs enter water through discharges from industrial and wastewater treatment plants.
- Most PAHs do not dissolve easily in water. They stick to solid particles and settle to the bottoms of lakes or rivers.
- Microorganisms can break down PAHs in soil or water after a period of weeks to months.
- In soils, PAHs are most likely to stick tightly to particles; certain PAHs move through soil to contaminate underground water.
- PAH contents of plants and animals may be much higher than PAH contents of soil or water in which they live.

How might I be exposed to PAHs?

- Breathing air containing PAHs in the workplace of coking, coal-tar, and asphalt production plants; smokehouses; and municipal trash incineration facilities.
- Breathing air containing PAHs from cigarette smoke, wood smoke, vehicle exhausts, asphalt roads, or agricultural burn smoke.
- Coming in contact with air, water, or soil near hazardous waste sites.
- Eating grilled or charred meats; contaminated cereals, flour, bread, vegetables, fruits, meats; and processed or pickled foods.
- Drinking contaminated water or cow's milk.
- Nursing infants of mothers living near hazardous waste sites may be exposed to PAHs through their mother's milk.

Agency for Toxic Substances and Disease Registry
Division of Toxicology and Human Health Sciences
ATSDR
CS265956-A

Polycyclic Aromatic Hydrocarbons

How can PAHs affect my health?

Mice that were fed high levels of one PAH during pregnancy had difficulty reproducing and so did their offspring. These offspring also had higher rates of birth defects and lower body weights. It is not known whether these effects occur in people.

Animal studies have also shown that PAHs can cause harmful effects on the skin, body fluids, and ability to fight disease after both short- and long-term exposure. But these effects have not been seen in people.

How likely are PAHs to cause cancer?

The Department of Health and Human Services (DHHS) has determined that some PAHs may reasonably be expected to be carcinogens.

Some people who have breathed or touched mixtures of PAHs and other chemicals for long periods of time have developed cancer. Some PAHs have caused cancer in laboratory animals when they breathed air containing them (lung cancer), ingested them in food (stomach cancer), or had them applied to their skin (skin cancer).

Is there a medical test to show whether I've been exposed to PAHs?

In the body, PAHs are changed into chemicals that can attach to substances within the body. There are special tests that can detect PAHs attached to these substances in body tissues or blood. However, these tests cannot tell whether any health effects will occur or find out the extent or source of your exposure to the PAHs. The tests aren't usually available in your doctor's office because special equipment is needed to conduct them.

Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) has set a limit of 0.2 milligrams of PAHs per cubic meter of air (0.2 mg/m^3). The OSHA Permissible Exposure Limit (PEL) for mineral oil mist that contains PAHs is 5 mg/m^3 averaged over an 8-hour exposure period.

The National Institute for Occupational Safety and Health (NIOSH) recommends that the average workplace air levels for coal tar products not exceed 0.1 mg/m^3 for a 10-hour workday, within a 40-hour workweek. There are other limits for workplace exposure for things that contain PAHs, such as coal, coal tar, and mineral oil.

Glossary

Carcinogen: A substance that can cause cancer.

Ingest: Take food or drink into your body.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for polycyclic aromatic hydrocarbons. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636.

ToxFAQs™ Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Print

Planning Commission May 1, 2023 Public Comment - Submission #3058

Date Submitted: 4/27/2023

First and Last Name*

Ayla Leistikow

Email Address*

Ayla.leistikow@gmail.com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

8605 Citation Ct

Public Comment for the Planning Commission May 1, 2023 Meeting

Dear Planning Board, The intent of this letter is to bring attention to our 2,640â€™ setback for producing and curating toxic chemicals. Itâ€™s frustrating to hear the EPA say they donâ€™t have the resources or money to deal with toxic chemicals coming from asphalt plant emissions, so they leave it up to each state. Colorado has been severely neglecting families by not putting money into research for this industry. In the documents Iâ€™ve submitted, you can see North Carolina is very upfront about these toxic chemicals. New Jersey has information that poisonous gases are produced in a fire, containers may explode. A quick google search shows asphalt plant explosions happen more often than they should. Asking for a continuance for the air dispersion study is useless. The air dispersion study is finding thresholds for these toxic chemicals, Connell wouldnâ€™t be able to do the study without producing toxic chemicals. The land use code does not reference thresholds in the setback, the plant has to simply produce toxic chemicals. I am asking the board to deny the continuance and apply the 2,640ft setback for producing and curating toxic chemicals. I have also included emails from the Weld County planner, and Larimer County planner stating Connellâ€™s options for finding a safer location away from families. Thanks, Ayla Leistikow

Optional File Attachment

County planners.pdf

Optional File Attachment

Poisonous gases.pdf

Optional File Attachment

Environmental Quality.pdf

>>>>>>>>>>>>>>>>> EMERGENCY INFORMATION <<<<<<<<<<<<<<<<<

Common Name: **ASPHALT**
DOT Number: **NA 1999 (Asphalt)**
UN 1999 (Tars, Liquid)
DOT Hazard Class: **3 (Flammable)**
NAERG Code: **130**
CAS Number: **8052-42-4**

Hazard rating	NJDHSS	NFPA
FLAMMABILITY	-	1, 2 or 3
REACTIVITY	-	0
FLAMMABLE OR COMBUSTIBLE DEPENDING ON FORMULATION POISONOUS GASES ARE PRODUCED IN FIRE CONTAINERS MAY EXPLODE IN FIRE		

Hazard Rating Key: 0=minimal; 1=slight; 2=moderate; 3=serious; 4=severe

FIRE HAZARDS

- *Cutback* and *Rapid Curing* **Asphalt** are FLAMMABLE.
- *Typical* or *Medium* to *Slow Curing* **Asphalt** is COMBUSTIBLE.
- Use dry chemical, CO_2, water spray, or a foaming agent.
- Water may cause frothing so do not apply solid streams of water directly on **Asphalt**.
- POISONOUS GASES ARE PRODUCED IN FIRE including *Sulfer Oxides* and *Hydrogen Sulfide*.
- CONTAINERS MAY EXPLODE IN FIRE.
- Use water spray to keep fire-exposed containers cool.
- Vapors may travel to a source of ignition and flash back.
- Vapor is heavier than air and may travel a distance to cause a fire or explosion far from the source.
- If employees are expected to fight fires, they must be trained and equipped as stated in the OSHA Fire Brigades Standard (29 CFR 1910.156).

SPILLS AND EMERGENCIES

If **Asphalt** is spilled or leaked, take the following steps:

- Evacuate personnel and secure and control entrance to the area.
- Eliminate all ignition sources.
- Absorb liquids in vermiculite, dry sand, earth, or a similar material and deposit in sealed containers.
- Ventilate and wash area after clean-up is complete.
- Keep **Asphalt** out of a confined space, such as a sewer, because of the possibility of an explosion.
- It may be necessary to contain and dispose of **Asphalt** as a HAZARDOUS WASTE. Contact your state Department of Environmental Protection (DEP) or your regional office of the federal Environmental Protection Agency (EPA) for specific recommendations.
- If employees are required to clean-up spills, they must be properly trained and equipped. The OSHA Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120) may apply.

FOR LARGE SPILLS AND FIRES immediately call your fire department. You can request emergency information from the following:

CHEMTREC: (800) 424-9300
NJDEP HOTLINE: 1-877-WARN-DEP

HANDLING AND STORAGE (See page 3)

FIRST AID

For POISON INFORMATION call 1-800-222-1222

Eye Contact
- Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting upper and lower lids.

Skin Contact
- Quickly remove contaminated clothing. Immediately wash contaminated skin with large amounts of soap and water.

Breathing
- Remove the person from exposure.
- Begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped.
- Transfer promptly to a medical facility.

PHYSICAL DATA

Flash Point:
Cutback Asphalt: less than 50°F (10°C)
Slow to *Rapid Curing Asphalt*: 80°F (27°C) to 225°F (107°C)
Typical Asphalt: greater than 400°F (204°C)
Water Solubility: Insoluble

OTHER COMMONLY USED NAMES

This Fact Sheet can also be used for:
Alphalt (Cutback) RTK # 3172
Chemical Name:
Asphalt
Other Names:
Road Tar; Mineral Pitch; Petroleum Pitch; Bitumen

Not intended to be copied and sold for commercial purposes.

NEW JERSEY DEPARTMENT OF HEALTH AND SENIOR SERVICES
Right to Know Program
PO Box 368, Trenton, NJ 08625-0368
(609) 984-2202

NORTH CAROLINA
Environmental Quality

Asphalt Plants

Hot mix asphalt is a proportioned mixture of dried aggregate and liquid asphaltic concrete cement used as roadway paving material. Aggregate is a graded mixture of crushed stone, sand and recycled asphalt paving. Liquid asphaltic concrete cement is a mixture of hundreds of organic compounds that remain after crude oil refining. There more than 150 asphalt plants in North Carolina with DAQ Air Quality Permits.

How does an asphalt plant work?

There are two types of asphalt plants, batch mix and drum mix (/air-quality/drum-mix/download?attachment). In a drum mix facility, undried aggregate and heated asphalt are placed directly into the rotary drum dryer, where they are mixed. The asphalt produced can be stored on site in heated storage silos or loaded directly into trucks and transported off-site. In a batch mix (/air-quality/batch-mix/download?attachment) facility, the aggregate is dried separately in a rotary drum dryer and stored in heated bins. Heated aggregate measured per batch in a weigh box and a proportional amount of heated asphalt are mixed in a pugmill and either stored on-

site in heated storage silos or loaded directly into trucks for transport off-site.

How are asphalt plants regulated by DAQ?

- All asphalt plants must obtain an air quality permit.
- Asphalt plants are subject to state regulations for criteria pollutant emissions of particulate matter, carbon monoxide, sulfur dioxide, nitrogen dioxide and volatile organic compounds. Most asphalt plant air quality permits include production limits to avoid applicability of Prevention of Significant Deterioration (PSD) rules (/air-quality/d0530/download?attachment).
- A DAQ currently active asphalt plant permit reflects what specific equipment can be operated at a specific location. As asphalt plants consist of portable equipment modules, an asphalt plant may be moved and operated at numerous permitted locations depending on paving contracts.
- In November 1999 DAQ issued an asphalt plant permitting policy (/water-quality/chemistry-lab/certification/memos/991118/download), which requires new and modified asphalt plant applications to quantify all 97 Toxic Air Pollutants (TAPs) emitted to determine the need for air toxics permit limits using EPA AP-42 emissions.
  - If the emissions of a specific TAP are below their regulatory threshold in NC Regulation 15A NCAC 2Q.0711 (/air-quality/q0711/download?attachment), an air quality permit is not required.
  - If the TAP emissions exceed its threshold, a dispersion modeling demonstration must be performed. The results of this model must show that the emissions are below the acceptable ambient level (AAL) listed in NC Regulation 15A NCAC 2D.1104 (/air-quality/d1104/download?attachment), and air quality permit emission limit, for the respective TAP not to exceed the AAL, is required.
- Air pollutant emissions from asphalt plants can be calculated using the DAQ

Asphalt Plant Spreadsheet (.xls) (/documents/files/hma/download).

- In August 13, 2013 DAQ issued the Emission Testing Frequency Policy (/air-quality/hot-mix-asphalt-plant-performance-testing/download?attachment), which establishes the baseline testing frequency of 120 months, unless other factors require more frequent testing schedule.

Why are there are so many asphalt plants?

North Carolina has the second largest state-maintained highway system in the United States. The state has about 80,000[1] miles of roads, with more under construction every year. In addition, roads generally need resurfacing every 12 to 15 years, so about 4,400 miles of roads are repaved each year. Paving is difficult at lower temperatures, and highway contractors must reject asphalt that is not hot enough (at least 250oF). That means asphalt plants must be located fairly close to road construction sites.

What TAPs do asphalt plants emit?

Toxic air pollutants compounds emitted from asphalt plants include polycyclic aromatic compounds, volatile organic compounds, metals and hydrogen sulfide.

Toxic air pollutants (TAPs) emitted from asphalt plant[2]

Toxic Air Pollutant	Emitted from drum dryer and hot oil heater	Emitted from material handling and storage
Acetaldehyde	yes	no
Acrolein	yes	no

Formaldehyde	yes	yes
Phenol	no	yes
Styrene	no	yes
Trichlorofluoromethane (CFC 111)	no	yes
Methyl chloroform	yes	yes
Methyl ethyl ketone	yes	yes
Toluene	yes	yes
Xylene	yes	yes
Methylene chloride	no	yes
Soluble Chromate Compounds, as Chromium (VI)	yes	no
n-Hexane	yes	yes
Manganese & compounds	yes	no
Mercury	yes	no

Nickel & Compounds	yes	no
Carbon disulfide	no	yes
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	yes	no
Arsenic & Compounds	yes	no
Benzene	yes	yes
Benzo(a)pyrene	yes	yes
Hydrogen Sulfide	yes	yes
Beryllium	yes	no
Cadmium	yes	no
Hexachlorodibenzo-p-dioxin, 1,2,3,6,7,8	yes	no
Hydrogen Chloride (hydrochloric acid)	yes	no
Perchloroethylene (tetrachloroethylene)	no	yes
Trichloroethylene	no	yes

From: Tom Parko Jr. tparko@weldgov.com
Subject: RE: Zoning county land
Date: Jan 26, 2023 at 8:55:27 AM
To: Ayla Leistikow ayla.leistikow@gmail.com

Good morning, Ayla.

Yes, the County's I-3 industrial zone district can accommodate asphalt and concrete batch plants with a Site Plan Review (SPR). Please see attached. See Section 23-3-330.C.4.

Sincerely,
Tom Parko
Director, Dept. of Planning Services
Weld County

-----Original Message-----
From: Ayla Leistikow <ayla.leistikow@gmail.com>
Sent: Wednesday, January 25, 2023 3:39 PM
To: Tom Parko Jr. <tparko@weldgov.com>
Subject: Zoning county land

Caution: This email originated from outside of Weld County Government. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hello,

I have a question regarding zoning. Can an asphalt company buy county land and get it rezoned to heavy industrial for a batch asphalt plant?

Thanks,
Ayla

From: Lea Schneider schneils@co.larimer.co.us
Subject: Re: Wellington asphalt plant
Date: Jan 11, 2023 at 9:34:04 AM
To: Ayla Leistikow ayla.leistikow@gmail.com

Good morning Ayla!

I did not see the connell made it to planning commission on Mon...is that true?

1. Connell could purchase land in unincorporated Larimer County and apply to rezone the land. This would require the company to submit a sketch plan application with Larimer County, hold a public meeting, then apply for a public hearing rezoning application. They would also have to complete a Special Review process either combined or separate applications. This process could take over a year or more.

Print

Planning Commission May 1, 2023 Public Comment - Submission #3059

Date Submitted: 4/27/2023

First and Last Name*

Randi Vilkaitis

Email Address*

Randinicole502@hotmail.com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

3282 grizzly way

Public Comment for the Planning Commission May 1, 2023 Meeting

To whom it may concern, In regards to the proposed asphalt plant, I strongly oppose the decision to allow the plant to be near Wellington. As a resident and homeowner in the Buffalo creek subdivision this will directly effect me and my family. Not only will my home value be compromised, but the pollution and health effects on me, my children and my animals is unacceptable. Also, Wellington is already on an infrastructure system that has been spread thin for years. For years now we have been on water restrictions, constant power outages and the traffic at peak times such as school start and finish times is already an issue. This area is not capable of supporting what is already here plus any industrial plant of any kind. Please take these concerns into consideration when discussing this asphalt plant near Wellington. Thank you.

Optional File Attachment

Choose File | No file selected

Optional File Attachment

Choose File | No file selected

Optional File Attachment

Choose File | No file selected

Print

Planning Commission May 1, 2023 Public Comment - Submission #3061

Date Submitted: 4/28/2023

First and Last Name*

David Goodness

Email Address*

dgoodness@comcast.net

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

7090 Grassy Range Dr

Public Comment for the Planning Commission May 1, 2023 Meeting

To Whom it May Concern: I recently learned of the proposed development of an asphalt plant near the Wellington Community Park. I am very disappointed that this is being considered. Not only do I live in Wellington, but I take my granddaughter to the Community Park to enjoy the playgrounds and water park. There are no benefits to this plan as everyone knows an asphalt plant is a heavy industry that produces toxic chemicals, which will affect the health of people and the environment. There must be a safe distance between this project and citizens of Wellington. I hope I can be assured that the leaders of this community have the health and safety interests of its citizens in mind. Thank you

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Print

Planning Commission May 1, 2023 Public Comment - Submission #3062

Date Submitted: 4/28/2023

First and Last Name*

Dr. Fred Condos

Email Address*

fjc448@gmail ,com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

8994 Raging Bull Lane

Public Comment for the Planning Commission May 1, 2023 Meeting

My name is Dr. Fred Condos. I am retired and reside at the above stated address in the Buffalo Creek neighborhood. Our home is almost 3/4 of a mile from the proposed Connell Resources Hot Batch Asphalt Plant. I oppose the approval of Connell's application! The Town has not provided sufficient indications to the citizens of Wellington that answer the following: How will the construction of an Asphalt Plant within the city limits of Wellington benefit its' residents? Will it benefit us to be exposed to known health hazards from the proposed Asphalt Plant emissions particularly Nitrogen Oxides? See attachment from the U.S. Center for Disease Control Medical Management Guidelines for Nitrogen Oxides describing the health hazards posed even by the acceptable emission levels of Nitrogen Oxides. On June 20, 2021, The Colorado Department of Health & Environment issued an Out of Compliance status for excessive Carbon Monoxide and Nitrogen Oxides emission rates from the asphalt baghouse to the Connell Asphalt Plant in Fort Collins. The Stack Test and attending documents can be obtained from the Colorado Department of Health $ Environment. The Commission likely already has that information. Will it happen here too? How would that benefit us? Will it benefit us to be exposed to the excessive noise associated the process from trucks, loading and unloading aggregate materials, as well as truck trave to and from plant? Will it benefit us to have the park, people's back yards, schools the Community Park and neighborhoods barren of people on hot days and nights from the smell and particulates emitting from the plant stack? . Are the road conditions adequate to support the excessive truck loads a day. Who is responsible to improve and maintain the road improvements? Will these needs be a benefit to us? Will it benefit us when our property values drop because of an asphalt plant in our city limits? Most of us worked hard and planned carefully to make a happy, secure, quiet and safe home and environment to live, raise our children and spend our retirement years absent a preposterous and intrusive thing like an asphalt plant as a neighbor, Please answer us about how we benefit with an asphalt plant in our backyards? I am not convinced! Will our quality of life, our peace and happiness be improved and benefit us if the plant is built.

Optional File Attachment

Nitrogen Oxides _ Medical Management Guidelines _ Toxic Substance Portal .pdf

Optional File Attachment

Choose File | No file selected

Optional File Attachment

Choose File | No file selected

Toxic Substances Portal

Medical Management Guidelines for Nitrogen Oxides

(NO, NO_2, and others)

CAS# 10102-43-9, 10102-44-0
UN# 1660 (NO), 1067 (NO_2), 1975 (Mixture)

PDF Version [295 KB]

Synonyms for nitric oxide (NO) include mononitrogen monoxide and nitrogen monoxide. Synonyms for nitrogen dioxide (NO_2) include dinitrogen tetroxide, nitrogen peroxide, nitrogen tetroxide, and NTO. Synonyms for mixtures of nitrogen oxides include nitrogen fumes and nitrous fumes.

- Persons exposed only to nitrogen oxide gases do not pose substantial secondary contamination risks. Persons whose clothing is contaminated with liquid nitrogen oxides can secondarily contaminate others by direct contact or through off-gassing vapors.
- Nitric oxide and nitrogen dioxide are nonflammable liquids or gases; however, they will accelerate the burning of combustible materials. Odor generally provides an adequate warning of acute exposure providing the higher oxides (NO_2, N_2O_4 and N_2O_5) are present. Nitric oxide (NO) is odorless and nitrous oxide (N_2O) has only a very faint odor.
- The primary route of exposure to nitrogen oxides is by inhalation, but exposure by any route can cause systemic effects. Nitrogen oxides are irritating to the eyes, skin, mucous membranes, and respiratory tract. On contact with moisture, nitrogen dioxide forms a mixture of nitric and nitrous acids.

General Information

Description

Nitrogen oxides represent a mixture of gases designated by the formula NO_x. The mixture includes nitric oxide (NO), nitrogen dioxide (NO_2), nitrogen trioxide (N_2O_3), nitrogen tetroxide (N_2O_4), and nitrogen pentoxide (N_2O_5). The toxicity of nitrous oxide (N_2O) or laughing gas, which is used as an anesthetic, is different from that of the other nitrogen oxides and is not discussed in this protocol.

The most hazardous of the nitrogen oxides are nitric oxide and nitrogen dioxide; the latter exists in equilibrium with its dimer, nitrogen tetroxide. Nitric oxide is a colorless gas at room temperature, very sparingly soluble in water. Nitrogen dioxide is a colorless to brown liquid at room temperature and a reddish-brown gas above 70°F poorly soluble in water. Nitric oxide is rapidly oxidized in air at high concentrations to form nitrogen dioxide.

Routes of Exposure

Inhalation

Nitrogen oxides (NO_2, N_2O_4, N_2O_3 and N2O5) are irritating to the upper respiratory tract and lungs even at low concentrations. Only one or two breaths of a very high concentration can cause severe toxicity. Odor is generally an adequate warning property for acute exposures. Nitrogen dioxide is heavier than air, such that exposure in poorly ventilated, enclosed, or low-lying areas can result in asphyxiation.

Children exposed to the same levels of nitrogen oxides as adults may receive larger doses because they have greater lung surface area:body weight ratios and increased minute volumes:weight ratios. In addition, they may be exposed to higher levels of nitrogen dioxide than adults in the same location because of their short stature and the higher levels of nitrogen

dioxide found nearer to the ground.

Skin/Eye Contact

Exposure to relatively high air concentrations can produce eye irritation and inflammation.

Children are more vulnerable to toxicants affecting the skin because of their relatively larger surface area:body weight ratio.

Ingestion

Both nitrogen dioxide and nitric oxide are gases at room temperature. However, nitrogen dioxide exists as a liquid below 21°C and, if ingested, will cause gastrointestinal irritation or burns.

Sources/Uses

Nitrogen oxides form naturally during the oxidation of nitrogen-containing compounds such as coal, diesel fuel, and silage. Nitrogen oxides are also formed during arc welding, electroplating, engraving, dynamite blasting, as components of rocket fuel, and nitration reactions such as in the production of nitro-explosives, including gun-cotton, dynamite and TNT. They are produced commercially, usually as the first step in the production of nitric acid, either by the direct oxidation of atmospheric nitrogen in the electric arc (Birkeland-Eyder Process) or by the catalytic oxidation of anhydrous ammonia (Oswald Process). Trace metal impurities most likely cause nitrogen oxides to form in nitric acid and its solutions. Nitrogen oxides are intermediates in the production of lacquers, dyes, and other chemicals and are important components of photo-oxidant smog.

Standards and Guidelines

Nitric Oxide: OSHA PEL (permissible exposure limit) = 25 ppm (averaged over an 8-hour workshift)

NIOSH IDLH (immediately dangerous to life or health) = 100 ppm

Nitrogen Dioxide: OSHA PEL (permissible exposure limit) = 5 ppm (Ceiling)

NIOSH IDLH (immediately dangerous to life or health) = 20 ppm

Nitrogen Dioxide AIHA ERPG-2 (maximum airborne concentration below which it is believed that nearly all persons could be exposed for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair their abilities to take protective action) = 15 ppm

Physical Properties

Nitric Oxide

Description: Colorless gas Yellow-brown liquid or red-brown gas

Warning properties: Non-irritating, odorless and colorless gas; no adequate 1-5 ppm; warning for acute exposure unless accompanied by NO_2 or another higher oxide as is usual.

Molecular weight: 30.0 daltons

Boiling point (760 mm Hg): -241°F (-152°C)

Freezing point: -263°F (-164°C)

Vapor pressure: >760 mm Hg at 68°F (20°C)

Gas density: 1.0 (air = 1)

Water solubility: Water soluble

Flammability: Not flammable, but will accelerate burning of combustible materials

Nitrogen Dioxide

Description: Yellow-brown liquid or red-brown gas

Warning properties: Irritating, sharp odor at adequate warning for acute exposure; inadequate warning for chronic exposure.

Molecular weight: 46.0 daltons

Boiling point (760 mm Hg): 70°F (21°C)

Freezing point: 12°F (-11°C)

Vapor pressure: 720 mm Hg at 68°F (20°C)

Gas density: 1.5 (air = 1)

Water solubility: Highly soluble, but reacts with water to form a mixture of nitric and nitrous acids.

Flammability: Not flammable, but will accelerate burning of combustible materials

Incompatibilities

Nitrogen dioxide and nitric acid react with combustible materials, chlorinated hydrocarbons, carbon disulfide, and ammonia. May react violently with cyclohexane, fluorine, formaldehyde and alcohol, nitrobenzene, petroleum, and toluene.

Health Effects

- Most of the higher oxides of nitrogen are eye, skin, and respiratory tract irritants. Nitrogen dioxide is a corrosive substance that forms nitric and nitrous acids upon contact with water; it is more acutely toxic than nitric oxide, except at lethal concentrations when nitric oxide may kill more rapidly.Nitric oxide is a potent and rapid inducer of methemoglobinemia.
- Exposure to nitrogen oxides may result in changes of the pulmonary system including pulmonary edema, pneumonitis, bronchitis, bronchiolitis, emphysema, and possibly methemoglobinemia. Cough, hyperpnea, and dyspnea may be seen after some delay.
- Damage to, and subsequent scarring of, the bronchioles may result in a life-threatening episode several weeks following exposure involving cough, rapid, shallow breathing, rapid heartbeat, and inadequate oxygenation of the tissues.
- Populations that may be particularly sensitive to nitrogen oxides include asthmatics and those with chronic obstructive pulmonary disease or heart disease.

Acute Exposure

Nitrogen dioxide is thought to damage lungs in three ways: (1) it is converted to nitric and nitrous acids in the distal airways, which directly damages certain structural and functional lung cells; (2) it initiates free radical generation, which results in protein oxidation, lipid peroxidation, and cell membrane damage; and (3) it reduces resistance to infection by altering macrophage and immune function. There may be an immediate response to exposure to nitrogen oxide vapors that may include coughing, fatigue, nausea, choking, headache, abdominal pain, and difficulty breathing. A symptom-free period of 3 to 30 hours may then be followed by the onset of pulmonary edema with anxiety, mental confusion, lethargy, and loss of consciousness. If survived, this episode may be followed by bronchiolitis obliterans (fibrous obstruction of the bronchioles) several weeks later. Any of these phases can be fatal.

Children do not always respond to chemicals in the same way that adults do. Different protocols for managing their care may be needed.

Respiratory

The higher nitrogen oxides are respiratory irritants. The primary site of toxicity is the lower respiratory tract. Low concentrations initially may cause mild shortness of breath and cough; then, after a period of hours to days, victims may suffer bronchospasm and pulmonary edema. Inhalation of very high concentrations can rapidly cause burns, spasms, swelling of tissues in the throat, upper airway obstruction, and death.

Exposure to certain chemicals can lead to Reactive Airway Dysfunction Syndrome (RADS), a chemically- or irritant-induced type of asthma.

Children may be more vulnerable to corrosive agents than adults because of the relatively smaller diameter of their airways. Children also may be more vulnerable because of relatively increased minute ventilation per kg and failure to evacuate an area promptly when exposed.

Cardiovascular

Absorption of nitrogen oxides can lead to a weak rapid pulse, dilated heart, chest congestion, and circulatory collapse.

Hematologic

High-dose exposure may convert Fe^{+2} in hemoglobin to Fe^{+3}, by virtue of the presence of nitric oxide (NO), causing methemoglobinemia and impaired oxygen transport.

Dermal

Higher nitrogen oxides are skin irritants and corrosives. Skin moisture in contact with liquid nitrogen dioxide or high concentrations of its vapor can result in nitric acid formation, which may lead to second-and third-degree skin burns. Nitric acid may also cause yellowing of the skin and erosion of dental enamel.

Because of their relatively larger surface area:body weight ratio, children are more vulnerable to toxicants affecting the skin.

Ocular

Liquid nitrogen oxides cause severe eye burns after brief contact. High concentrations of the gas cause irritation and, after prolonged exposure, may cause clouding of the eye surface and blindness.

Potential Sequelae

Obstruction of the bronchioles may develop days to weeks after severe exposure. Patients suffer malaise, weakness, fever, chills, progressive shortness of breath, cough, hemorrhage of the lungs or bronchioles, blue or purple coloring of the skin, and respiratory failure. This condition may be confused with the adult respiratory distress syndrome secondary to infectious diseases such as miliary tuberculosis.

Victims of inhalation exposure may suffer reactive airways dysfunction syndrome (RADS) after a single acute, high-dose exposure.

Chronic Exposure

Chronic exposure to nitrogen oxides is associated with increased risk of respiratory infections in children. Permanent restrictive and obstructive lung disease from bronchiolar damage may occur.

Carcinogenicity

Nitrogen oxides have not been classified for carcinogenic effects.

Reproductive and Developmental Effects

Nitric oxide and nitrogen dioxide are not included in *Reproductive and Developmental Toxicants*, a 1991 report published by the U.S. General Accounting Office (GAO) that lists 30 chemicals of concern because of widely acknowledged reproductive and developmental consequences. Methemoglobin inducers are considered harmful to the fetus and nitrogen dioxide has been shown to be fetotoxic in rats and has affected behavior and growth statistics in newborn mice. Nitrogen dioxide also causes DNA damage, mutations, sister chromatid exchanges, and other DNA aberrations.

Special consideration regarding the exposure of pregnant women may be warranted, since nitrogen oxides have been shown to be mutagenic and clastogenic, and fetotoxic in rats; thus, medical counseling is recommended for the acutely exposed pregnant woman.

Prehospital Management

- Victims exposed only to nitrogen oxide gases do not pose risks of secondary contamination to rescuers. Victims whose clothing or skin is contaminated with liquid nitrogen oxides or nitric acid can secondarily contaminate response personnel by direct contact or through off-gassing vapors.
- Most of the higher nitrogen oxides are eye, skin, and respiratory tract irritants. Initial respiratory symptoms after exposure to nitrogen oxides may be mild, but progressive inflammation of the lungs may develop several hours to days after exposure. Noncardiogenic pulmonary edema may develop even if initial pulmonary signs were minimal. Exposures may result in methemoglobinemia, depending upon the presence of nitric oxide (NO) in the gas mixture.
- There is no antidote for nitrogen oxides. Primary treatment consists of respiratory and cardiovascular support. Methylene blue may be necessary to treat methemoglobinemia.

Hot Zone

Rescuers should be trained and appropriately attired before entering the Hot Zone. If the proper equipment is not available, or if rescuers have not been trained in its use, assistance should be obtained from a local or regional HAZMAT team or other properly equipped response organization.

Rescuer Protection

Nitrogen oxides are severe respiratory tract irritants.

Respiratory Protection: Positive-pressure, self-contained breathing apparatus (SCBA) is recommended in response situations that involve exposure to potentially unsafe levels of nitrogen oxides.

Skin Protection: Chemical-protective clothing is recommended when repeated or prolonged contact with liquids of nitrogen oxides or with high concentrations of nitrogen oxide vapors is anticipated because skin irritation or burns may occur.

ABC Reminders

Quickly access for a patent airway, ensure adequate respiration and pulse. If trauma is suspected, maintain cervical immobilization manually and apply a cervical collar and a backboard when feasible.

Victim Removal

If victims can walk, lead them out of the Hot Zone to the Decontamination Zone. Victims who are unable to walk may be removed on backboards or gurneys; if these are not available, carefully carry or drag victims to safety.

Consider appropriate management of chemically contaminated children, such as measures to reduce separation anxiety if a child is separated from a parent or other adult.

Decontamination Zone

Victims exposed only to nitrogen oxide gases may appear to have no skin or eye irritation. However, they should still be decontaminated as described below as irritation may not become evident until washing commences.

Rescuer Protection

If exposure levels are determined to be safe, decontamination may be conducted by personnel wearing a lower level of protection than that worn in the Hot Zone (described above).

ABC Reminders

Quickly access for a patent airway, ensure adequate respiration and pulse. Stabilize the cervical spine with a collar and a backboard if trauma is suspected. Administer supplemental oxygen as required. Assist ventilation with a bag-valve-mask device if necessary.

Basic Decontamination

Victims who are able may assist with their own decontamination. Remove and double-bag contaminated clothing and personal belongings.

Flush exposed skin and hair with water for 20 minutes. Use caution to avoid hypothermia when decontaminating children or the elderly. Use blankets or warmers when appropriate.

Immediately begin irrigation of exposed or irritated eyes with plain water or saline and continue for at least 20 minutes. Remove contact lenses if easily removable without additional trauma. Continue eye irrigation during other basic care and transport.

If the victim has ingested a solution of nitrogen oxides or nitric acid, **do not induce emesis**. Do not administer activated charcoal. Victims who are conscious and able to swallow should be given 4 to 8 ounces of water or milk.

Consider appropriate management of chemically contaminated children at the exposure site. Also, provide reassurance to the child during decontamination, especially if separation from a parent occurs. If possible, seek assistance from a child separation expert.

Transfer to Support Zone

As soon as decontamination is complete, move the victim to the Support Zone.

Support Zone

Be certain that victims have been decontaminated properly (see *Decontamination Zone* above). Victims who have undergone decontamination pose no serious risks of secondary contamination to rescuers. In such cases, Support Zone personnel require no specialized protective gear.

ABC Reminders

Quickly access for a patent airway. If trauma is suspected, maintain cervical immobilization manually and apply a cervical collar and a backboard when feasible. Ensure adequate respiration and pulse. Administer supplemental oxygen as required and establish intravenous access if necessary. Place on a cardiac monitor.

Additional Decontamination

Continue irrigating exposed skin and eyes, as appropriate.

If the patient has ingested a solution of nitrogen oxides or nitric acid, **do not induce emesis**. Do not administer activated charcoal. Patients who are able to swallow should be given 4 to 8 ounces of water or milk, if not provided previously.

Advanced Treatment

In cases of respiratory compromise secure airway and respiration via endotracheal intubation. If not possible, perform cricothyroidotomy if equipped and trained to do so.

Treat patients who have bronchospasm with aerosolized bronchodilators. The use of bronchial sensitizing agents in situations of multiple chemical exposures may pose additional risks. Consider the health of the myocardium before choosing which type of bronchodilator should be administered. Cardiac sensitizing agents may be appropriate; however, the use of cardiac sensitizing agents after exposure to certain chemicals may pose enhanced risk of cardiac arrhythmias (especially in the elderly).

Consider racemic epinephrine aerosol for children who develop stridor. Dose 0.25-0.75 mL of 2.25% racemic epinephrine solution in 2.5 cc water, repeat every 20 minutes as needed, cautioning for myocardial variability.

Patients who are comatose, hypotensive, or are having seizures or cardiac arrhythmias should be treated according to advanced life support (ALS) protocols.

If evidence of shock or hypotension is observed begin fluid administration. For adults, bolus 1,000 mL/hour intravenous saline or lactated Ringer's solution if blood pressure is under 80 mm Hg; if systolic pressure is over 90 mm Hg, an infusion rate of 150 to 200 mL/hour is sufficient. For children with compromised perfusion administer a 20 mL/kg bolus of normal saline over 10 to 20 minutes, then infuse at 2 to 3 mL/kg/hour.

Transport to Medical Facility

Only decontaminated patients or patients not requiring decontamination should be transported to a medical facility. "Body bags" are not recommended.

Report to the base station and the receiving medical facility the condition of the patient, treatment given, and estimated time of arrival at the medical facility.

If a solution of nitrogen oxides, which means in effect a mixture of nitric (HNO_3) and nitrous (HNO_2) acids, has been ingested, prepare the ambulance in case the victim vomits toxic material. Have ready several towels and open plastic bags to quickly clean up and isolate vomitus.

Multi-Casualty Triage

Consult with the base station physician or regional poison control center for advice regarding triage of multiple victims. Because delayed respiratory compromise may occur even with minimal initial symptoms, all patients who have histories or evidence of exposure should be transported to a medical facility for evaluation. Because of the danger of acute, though delayed, onset of severe, life-threatening pulmonary edema from 3 to 30 hours after what may appear to have been quite a trivial exposure it is important that exposed subjects be maintained under medical surveillance for the first 48 hours post-exposure. If such are allowed to return home and acute pulmonary edema develops in a home environment during sleep it may not be possible to get the patient to resuscitative medical treatment in time. Others may be discharged at the scene after their names, addresses, and telephone numbers are recorded. Those discharged should be advised to seek medical care promptly if symptoms develop (see *Patient Information Sheet* below).

Emergency Department Management

- Patients exposed only to nitrogen oxide gases do not pose risks of secondary contamination to rescuers. Patients whose clothing or skin is contaminated with liquid nitrogen oxides or nitric acid can secondarily contaminate response personnel by direct contact or through off-gassing vapors.
- Most of the higher nitrogen oxides are eye, skin, and respiratory tract irritants. Initial respiratory symptoms after exposure to nitrogen oxides may be mild, but progressive inflammation of the lungs may develop several hours to days after exposure. Noncardiogenic pulmonary edema may develop even if initial pulmonary signs were minimal. Exposures may result in methemoglobinemia, depending upon the presence of nitric oxide (NO) in the gas mixture.
- There is no antidote for nitrogen oxides. Treatment consists of respiratory and cardiovascular support. Methylene blue may be necessary to treat methemoglobinemia.

Decontamination Area

Previously decontaminated patients may be transferred immediately to the Critical Care Area. Others require decontamination as described below.

Be aware that use of protective equipment by the provider may cause fear in children, resulting in decreased compliance with further management efforts.

Because of their relatively larger surface area:body weight ratio, children are more vulnerable to toxicants absorbed affecting the skin. Also, emergency room personnel should examine children's mouths because of the frequency of hand-to-mouth activity among children.

ABC Reminders

Evaluate and support airway, breathing, and circulation. Administer supplemental oxygen as required. Children may be more vulnerable to corrosive agents than adults because of the relatively smaller diameter of their airways. In cases of respiratory compromise secure airway and respiration via endotracheal intubation. If not possible, surgically create an airway.

Treat patients who have bronchospasm with aerosolized bronchodilators. The use of bronchial sensitizing agents in situations of multiple chemical exposures may pose additional risks. Consider the health of the myocardium before choosing which type of bronchodilator should be administered. Cardiac sensitizing agents may be appropriate; however, the use of cardiac sensitizing agents after exposure to certain chemicals may pose enhanced risk of cardiac arrhythmias (especially in the elderly).

Consider racemic epinephrine aerosol for children who develop stridor. Dose 0.25-0.75 mL of 2.25% racemic epinephrine solution in 2.5 cc water, repeat every 20 minutes as needed, cautioning for myocardial variability.

Patients who are comatose, hypotensive, or have seizures or ventricular arrhythmias should be treated in the conventional manner.

Basic Decontamination

Patients who are able may assist with their own decontamination. If the patient's clothing is wet with nitrogen oxides or nitric acid, remove and double-bag the contaminated clothing and all personal belongings.

Flush exposed skin and hair with water for 20 minutes (preferably under a shower). Use caution to avoid hypothermia when decontaminating children or the elderly. Use blankets or warmers when appropriate.

Begin irrigation of exposed eyes **immediately** and continue for at least 20 minutes. Remove contact lenses if easily removable without additional trauma to the eye. Continue irrigation while transporting the patient to the Critical Care Area.

If the patient has ingested a solution of nitrogen oxides or nitric acid, **do not induce emesis**. Do not administer activated charcoal. Activated charcoal is unlikely to be of benefit and may obscure endoscopic findings if GI tract irritation or burns are present. Patients who are conscious and able to swallow should be given 4 to 8 ounces of water or milk if not provided earlier.

Critical Care Area

Be certain that appropriate decontamination has been carried out (see *Decontamination Area* above).

ABC Reminders

Evaluate and support airway, breathing, and circulation as in *ABC Reminders* above. Administer supplemental oxygen as required. Children may be more vulnerable to corrosive agents than adults because of the relatively smaller diameter of their airways. Establish intravenous access in seriously symptomatic patients. Continuously monitor cardiac rhythm.

Patients who are comatose, hypotensive, or have seizures or ventricular arrhythmias should be treated in the conventional manner.

Inhalation Exposure

Administer supplemental oxygen by mask to patients who have respiratory symptoms. Treat patients who have bronchospasm with aerosolized bronchodilators. The use of bronchial sensitizing agents in situations of multiple chemical exposures may pose additional risks. Consider the health of the myocardium before choosing which type of bronchodilator should be administered. Cardiac sensitizing agents may be appropriate; however, the use of cardiac sensitizing agents after exposure to certain chemicals may pose enhanced risk of cardiac arrhythmias (especially in the elderly). Some clinicians recommend high doses of corticosteroids for seriously symptomatic patients, especially with severe bronchospasm; in patients with acute respiratory failure without bronchospasm, the value of steroids is unproven.

Consider racemic epinephrine aerosol for children who develop stridor. Dose 0.25-0.75 mL of 2.25% racemic epinephrine solution in 2.5 cc water, repeat every 20 minutes as needed, cautioning for myocardial variability.

Skin Exposure

If the skin was in contact with liquid nitrogen oxides or their solutions, chemical burns may occur; treat as thermal burns.

Because of their relatively larger surface area:body weight ratio, children are more vulnerable to toxicants affecting the skin.

Eye Exposure

Continue irrigation for at least 20 minutes. If liquid nitrogen oxides or nitric acid has been splashed in the eyes, irrigate until the pH of the conjunctival fluid has returned to normal. Test visual acuity. Examine the eyes for corneal damage and treat appropriately. Immediately consult an ophthalmologist for patients who have severe corneal injuries.

Ingestion Exposure

If the patient has ingested a solution of nitrogen oxides or nitric acid, **do not induce emesis**. Do not administer activated charcoal. Patients who are conscious and able to swallow should be given 4 to 8 ounces of water or milk if not provided earlier.

Consider endoscopy to evaluate the extent of gastrointestinal tract injury. Extreme throat swelling may require endotracheal intubation or cricothyroidotomy. Gastric lavage is useful in certain circumstances to remove caustic material and prepare for endoscopic examination. Consider gastric lavage with a small nasogastric tube if: (1) a large dose has been ingested; (2) the patient's condition is evaluated within 30 minutes; (3) the patient has oral lesions or persistent esophageal discomfort; and (4) the lavage can be administered within 1 hour of ingestion. Care must be taken when placing the gastric tube because blind gastric tube placement may further injure the chemically damaged esophagus or stomach.

Because children do no ingest large amounts of corrosive materials, and because of the risk of perforation from NG intubation, lavage is discouraged in children unless intubation is performed under endoscopic guidance.

Toxic vomitus or gastric washings should be isolated, e.g., by attaching the lavage tube to isolated wall suction or another closed container.

Antidotes and Other Treatments

There are no antidotes for nitrogen oxide poisoning. Methylene blue (tetramethylthionine chloride) should be considered for patients who have signs and symptoms of hypoxia (other than cyanosis) or for patients who have methemoglobin levels >30%. Cyanosis alone does not require treatment. Methylene blue may not be effective in patients who have G6PD deficiency and may cause hemolysis.

The standard dose of methylene blue is 1 to 2 mg/kg body weight (0.1 to 0.2 mL/kg of a 1% solution) intravenously over 5 to 10 minutes, repeated in 1 hour if needed. The total initial dose should not exceed 7 mg/kg. (Doses greater than 15 mg/kg may cause hemolysis.) Clinical response to methylene blue treatment is usually observed within 30 to 60 minutes. Side effects include nausea, vomiting, abdominal and chest pain, dizziness, diaphoresis, and dysuria.

Consider exchange transfusion in severely poisoned patients who are deteriorating clinically in spite of methylene blue treatment. Intravenous ascorbic acid administered to severely poisoned patients has not proved to be effective.

Administration of steroids is thought by some physicians to reduce the likelihood of the development of bronchiolitis obliterans by reducing inflammation and therefore lung damage. Steroids should be started soon after exposure and continued for 8 weeks, then tapered gradually. The data on steroid use to prevent late sequelae (bronchiolitis obliterans) is anecdotal and somewhat controversial.

Laboratory Tests

The diagnosis of acute nitrogen oxide toxicity is primarily based on respiratory symptoms and establishing a history of exposure to nitrogen oxides. Routine laboratory studies for all exposed patients include CBC, glucose, and electrolyte determinations. Additional studies for patients exposed to nitrous oxides include determination of methemoglobin levels. The condition of victims who have respiratory complaints should be evaluated with pulse oximetry (or ABG measurements), chest radiography, spirometry, and peak flow measurements. Pulse oximetry is not reliable if methemoglobin is present.

NO and NO_2 are metabolized to nitrite (NO_{2-}) and nitrate (NO_{3-}) and are excreted in the urine. The levels of these urinary metabolites are not medically useful but may be helpful in documenting exposure.

Disposition and Follow-up

Consider hospitalizing patients who have histories of significant inhalation exposure and are symptomatic.

Delayed Effects

Symptomatic patients should be observed in a controlled setting for 48 hours for delayed noncardiogenic pulmonary edema. All patients determined to have been exposed to nitrogen oxides should be advised that life-threatening symptoms may develop as late as several weeks after the exposure.

Patient Release

Patients who have been observed for several hours after minimal exposure and remain asymptomatic may be treated as outpatients. They should be advised to seek medical care promptly if symptoms develop (see *Nitrogen Oxides-Patient Information Sheet*). A patient whose symptoms resolve within 24 to 36 hours may be released with a follow-up appointment to assess pulmonary status.

Follow-up

Obtain the name of the patient's primary care physician so that the hospital can send a copy of the ED visit to the patient's doctor.

Close outpatient follow-up should be continued in patients who experienced significant respiratory compromise because these patients are at high risk of developing bronchiolitis obliterans within several weeks.

Patients who have corneal injuries should be reexamined within 24 hours.

Reporting

If a work-related incident has occurred, you may be legally required to file a report; contact your state or local health department.

Other persons may still be at risk in the setting where this incident occurred. If the incident occurred in the workplace, discussing it with company personnel may prevent future incidents. If a public health risk exists, notify your state or local health department or other responsible public agency. When appropriate, inform patients that they may request an evaluation of their workplace from OSHA or NIOSH. See Appendices III and IV for a list of agencies that may be of assistance.

Patient Information Sheet

This handout provides information and follow-up instructions for persons who have been exposed to nitrogen oxides.

Print this handout only. [44.1 KB]

What are nitrogen oxides?

Nitrogen oxides are a mixture of gases that each contain nitrogen and oxygen. Nitrogen oxides are formed naturally when fossil fuels (e.g., coal, oil, gas, kerosene) are burned and when silage containing nitrate fertilizer ferments in storage silos. They are also formed during electric arc welding, electroplating, and engraving. They are part of airborne smog and are partly indirectly responsible for the burning eyes, nose, and throat caused by air pollution, through formation of the intensely irritating compound peroxyacetylnitrate, PAN.

What immediate health effects can be caused by exposure to nitrogen oxides?

Breathing low levels of nitrogen oxides may cause brief, nonspecific symptoms such as cough, shortness of breath, tiredness, and nausea. However, even if removed from exposure, a person who has breathed nitrogen oxides can develop more serious lung injury over the next 1 to 2 days. Exposure to massive concentrations can cause sudden death due to lung injury and suffocation or choking. Generally, the more serious the exposure, the more severe the symptoms.

Can nitrogen oxides poisoning be treated?

There is no antidote for nitrogen oxide poisoning. Treatment for exposure usually involves giving the patient oxygen and medications to make breathing easier.

Are any future health effects likely to occur?

A single small exposure from which a person recovers quickly may not cause delayed or long-term effects. After a serious exposure or repeated exposures, a patient may develop asthma or other lung conditions.

What tests can be done if a person has been exposed to nitrogen oxides?

Specific tests for the presence of nitrogen oxides in blood or urine generally are not useful to the doctor. If a severe exposure has occurred, blood and urine analyses and other tests may show whether damage has been done to the lungs, heart, and brain. Testing is not needed in every case.

Where can more information about nitrogen oxides be found?

More information about nitrogen oxides can be obtained from your regional poison control center; your state, county, or local health department; the Agency for Toxic Substances and Disease Registry (ATSDR); your doctor; or a clinic in your area that specializes in occupational and environmental health. If the exposure happened at work, you may wish to discuss it with your employer, the Occupational Safety and Health Administration (OSHA), or the National Institute for Occupational Safety and Health (NIOSH). Ask the person who gave you this form for help in locating these telephone numbers.

Follow-up Instructions

Keep this page and take it with you to your next appointment. Follow *only* the instructions checked below.

Print instructions only. [44.1 KB]

[ ] Call your doctor or the Emergency Department if you develop any unusual signs or symptoms within the next 24 hours, especially:

[ ] Call your doctor or the Emergency Department if you develop any unusual signs or symptoms within the next 24 hours, especially:

- coughing or wheezing
- difficulty breathing, shortness of breath, or chest pain
- weakness, fatigue, or flu-like symptoms
- increased redness or pain or a pus-like discharge in the area of a skin burn

[ ] No follow-up appointment is necessary unless you develop any of the symptoms listed above.

[ ] Call for an appointment with Dr.____ in the practice of _____.

When you call for your appointment, please say that you were treated in the Emergency Department at _____ Hospital by_____and were advised to be seen again in ____days.

[ ] Return to the Emergency Department/Clinic on ____ (date) at _____ AM/PM for a follow-up examination.

[ ] Do not perform vigorous physical activities for 1 to 2 days.

[ ] You may resume everyday activities including driving and operating machinery.

[ ] Do not return to work for _____days.

[ ] You may return to work on a limited basis. See instructions below.

[ ] Avoid exposure to cigarette smoke for 72 hours; smoke may worsen the condition of your lungs.

[ ] Avoid drinking alcoholic beverages for at least 24 hours; alcohol may worsen injury to your stomach or have other effects.

[ ] Avoid taking the following medications: _____

[ ] You may continue taking the following medication(s) that your doctor(s) prescribed for you: _____

[ ] Other instructions: _____ _____

- Provide the Emergency Department with the name and the number of your primary care physician so that the ED can send him or her a record of your emergency department visit.
- You or your physician can get more information on the chemical by contacting: _____ or _____, or by checking out the following Internet Web sites: _____;_____.

Signature of patient _____ Date _____

Signature of physician _____ Date _____

Where can I get more information?

If you have questions or concerns, please contact your community or state health or environmental quality department or:

For more information, contact:
Agency for Toxic Substances and Disease Registry
Division of Toxicology and Human Health Sciences
4770 Buford Highway
Chamblee, GA 30341-3717
Phone: 1-800-CDC-INFO 888-232-6348 (TTY)
Email: Contact CDC-INFO

ATSDR can also tell you the location of occupational and environmental health clinics. These clinics specialize in recognizing, evaluating, and treating illnesses resulting from exposure to hazardous substances.

Page last reviewed: October 21, 2014

Print

Planning Commission May 1, 2023 Public Comment - Submission #3064

Date Submitted: 4/28/2023

First and Last Name*

Sue Burke

Email Address*

sue2nd9827@gmail.com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

8714 Crossfire Drive

Public Comment for the Planning Commission May 1, 2023 Meeting

I am writing in opposition to approval for the asphalt plant planned for Wellington. From my research, I have learned that overall Connell Resources is a reputable company. This is not about Connell's reputation. No company is perfect, and no human beings are perfect. If the asphalt plant is approved, there WILL be increased traffic noise, there WILL be odors, and there WILL be accidents, spills, and unforeseen events. There can be no guarantees these things won't happen, and won't affect our little town and its residents. Because there is no "perfect," and because human error will always be there, the aftermath to your decision is huge. An asphalt plant does not belong here in Wellington, close to the Wellington Community Park, nearby subdivisions, downtown Wellington, an elementary school, in addition to the entirely of this small town. The consequences of anything not going "perfectly" are serious, now and into the future. This facility is also not appropriate for a "desirable town." When looking for a good place to raise families, retire, relocate, who is going to pick a town which has an asphalt processing plant so near to families, schools, parks? It is not a good move for the future of Wellington and attracting other types of businesses. If the asphalt plant is approved, what will be next with precedent set? Please deny the proposed location of the asphalt processing plant. There are many places that are more appropriate for a facility like this. Please keep our town as a desirable place to live.

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Print

Planning Commission May 1, 2023 Public Comment - Submission #3065

Date Submitted: 4/28/2023

First and Last Name*

Shannon Evans

Email Address*

shannondevans@hotmail.com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

Public Comment for the Planning Commission May 1, 2023 Meeting

As a concerned resident that lives and owns a home in Wellington, I donâ€™t agree with the idea of approving an asphalt plant that is in close proximity to Wellington Community Park, Buffalo Creek subdivision and would also affect the air quality/environment of the rest of the community/town for all the residents of Wellington. All of the toxins that are involved with asphalt plants can have so many negative effects on human health including, but not limited to cancer, autoimmune issues, neurologic issues. I am a board certified family medicine physician and have seen the effects industrial toxins have on humans and ask that you take into consideration your communitiesâ€™ health and well being and do not approve an asphalt plant right next to where children/adults play and people live. Sincerely, Shannon Evans

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Print

Planning Commission May 1, 2023 Public Comment - Submission #3066

Date Submitted: 4/28/2023

First and Last Name*

Ryan Burtis

Email Address*

ryanbtownofwellington@gmail.com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

3234 Wild West Lane

Public Comment for the Planning Commission May 1, 2023 Meeting

I wanted to share several concerns about proposed asphalt plant. There is the potential for the plant to be harmful to the long term residential growth of Wellington as well as a potential negative impact on the quality of life for existing residents of the town. In addition, the fact that a local ordinance needed to be modified in order for this proposed asphalt plant to be allowed is a concern. I am concerned about what other local ordinances may need to be modified in the future to prompt business or industrial growth at the expense of residential growth. Another concern is that any potential buyers or renters looking at houses in the future may be discouraged from purchasing or renting due to concerns about noises or smells coming from the plant. As a result, the asphalt plant may have a detrimental effect on residential growth.

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Print

Planning Commission May 1, 2023 Public Comment - Submission #3067

Date Submitted: 4/28/2023

First and Last Name*

Kimberly and Kevin Paganelli

Email Address*

Paganellikimberly@gmail.com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

7101, Grassy Range Drive

Public Comment for the Planning Commission May 1, 2023 Meeting

To whom it may concern, We were shocked to hear the plan for an Asphalt plant here in Wellington. Not only was this surprising to hear because Wellington is a small rural town, but the plan to put it near so many neighboring houses and schools was alarming to say the least. We chose to raise our family in Wellington for its small town feel, farming community, and an overall healthier environment in comparison to areas in Northern Colorado that are more densely populated. It is absolutely heartbreaking that if the plans for the Asphalt plant come to pass, we will be forced to leave Wellington. We had many hopes that Wellingtons economy and infrastructure would continue to expand, as our young children grew, and we could benefit as a family from more businesses and families moving to town. We strongly feel an Asphalt plant will be the death of this potential in our community. Toxic fumes and chemicals released into our environment as our children grow, will not encourage more families or businesses to Wellington. We ask you to consider our plea to pass on this plan, and keep our children safe, as well as ensure Wellington's continued growth and expansion for years to come.

Optional File Attachment

Choose File | No file selected

Optional File Attachment

Choose File | No file selected

Optional File Attachment

Choose File | No file selected

Print

Planning Commission May 1, 2023 Public Comment - Submission #3068

Date Submitted: 4/28/2023

First and Last Name*

Maureen Kudola

Email Address*

Mktagray@gmail.com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

9016 painted horse ln

Public Comment for the Planning Commission May 1, 2023 Meeting

Iâ€™m writing this letter for those who it may concern, regarding the potential for the asphalt plant to be approved less than 2,640â€™ from the Buffalo creek neighborhood. It is my assertion that because asphalt batch plants are known for emitting toxic chemicals, such as Formaldehyde, Acetadelhyde, xylene and others, this asphalt plant MUST be considered heavy industry that curates toxic chemicals. And as such the 1,000 foot setback currently up for approval is wrong according to town land use codes. The board should recognize the health and welfare hazards to its citizens that use the Wellington Community Park and certainly those that reside in Buffalo Creek. Some of the chemicals curated by asphalt plants have been shown to cause headaches, severe breathing issues, cancer and birth defects. It would be irresponsible of the town to do anything other than classify this asphalt plant batch as industry that curates chemicals and toxins. Not to mention the negative property value impacts that it will have for every homeowner in Buffalo Creek. Property values will stagnate if not drop, which is of great concern to the hundreds of Wellington citizens that live in the Buffalo Creek community.

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Print

Planning Commission May 1, 2023 Public Comment - Submission #3069

Date Submitted: 4/28/2023

First and Last Name*

Deborah Condos

Email Address*

dcondoscpp@gmail.com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

8994 RAGING BULL LANE

Public Comment for the Planning Commission May 1, 2023 Meeting

Dear Planning Commissioners, **FACTS=TRUTH** **Fact**: The Larimer County Health Department representative assigned to the Connell Site Plan Review, Lea Schneider, states in her attached letter to the Town of Wellington that â€œhot mix asphalt plants release air pollutants.â€ â€œThe primary pollutants of concern include particulate matter, carbon monoxide, nitrogen oxides, volatile organic compounds, and/or sulfur oxides,â€ and, â€œAdditional non-criteria pollutants regulated by APCD include hazardous air pollutants (HAPS) as defined in the Air Quality Control Commission (AQCC) regulations.â€ The AQCC's website refers to the EPA's HAPS list. **Fact**: The EPA website states that two, among several hazardous air pollutants (HAPS) are Acetaldehyde and Arsenic. The attached EPA fact sheet on Acetaldehyde states that this hazardous air pollutant is â€œmainly used as an intermediate in the synthesis of other chemicals. Acute (short-term) exposure to acetaldehyde results in effects including irritation of the eyes, skin, and respiratory tract. Symptoms of chronic (long-term) intoxication of acetaldehyde resemble those of alcoholism.â€ **Fact**: The second EPA fact sheet attached states this about the hazardous air pollutant, Arsenic, â€œAcute (short-term), high-level inhalation exposure to inorganic arsenic has resulted in respiratory effects (cough, dyspnea, chest pain), gastrointestinal effects (nausea, diarrhea, abdominal pain), and central and peripheral nervous system effects.â€ Dyspnea, according to the Oxford dictionary, is difficult or labored breathing. The EPA fact sheet goes on to say that, â€œ Chronic (long-term) inhalation exposure to inorganic arsenic in humans is associated with skin, cardiovascular, and neurological effects.â€ All of the above is only a fraction of the reason I oppose the Connell asphalt plant being built in our backyards. The plant wonâ€™t just be in our backyards. All of Wellington and the surrounding areas will be affected by the plant. I donâ€™t believe any citizen of Wellington wants to breathe hazardous air pollutants on a daily basis. Do you? For the sake of our health, our children and grandchildrenâ€™s health and a thousand other reasons, please move to deny the site plan for Connell Resources asphalt plant! Thank you! Debbie Condos Wellington Buffalo Creek Resident

Optional File Attachment

Larimer Cnty Health Dept - Lea Schneider.pdf

Optional File Attachment

EPA Acetaldehyde Fact Sheet.pdf

Optional File Attachment

EPA Arsenic Compounds Fact Sheet.pdf

LARIMER COUNTY | HEALTH AND ENVIRONMENT

1525 Blue Spruce Drive, Fort Collins, Colorado 80524-2004, 970.498.6775, www.larimer.org/health/ehs/

TO: Paul Whalen
Senior Planner
Town of Wellington

FROM: Lea Schneider
Environemtnal Health Planner
Larimer County Department of Public Health & Environment

DATE: December 21, 2022

SUBJECT: Connell's Wellington Asphalt Plant Site Plan Referral Review

Larimer Department of Health and Environment (LCDHE) has reviewed the site plan application materials provided in the referral email dated November 29, 2022. In addition, LCDHE met with Connell Resources, Inc. on December 21, 2022. The following LCDHE comments include requirements of associated regulations as well as recommendations for the Town to consider for additional public health protections when evaluating the application for compatibility to the residential areas.

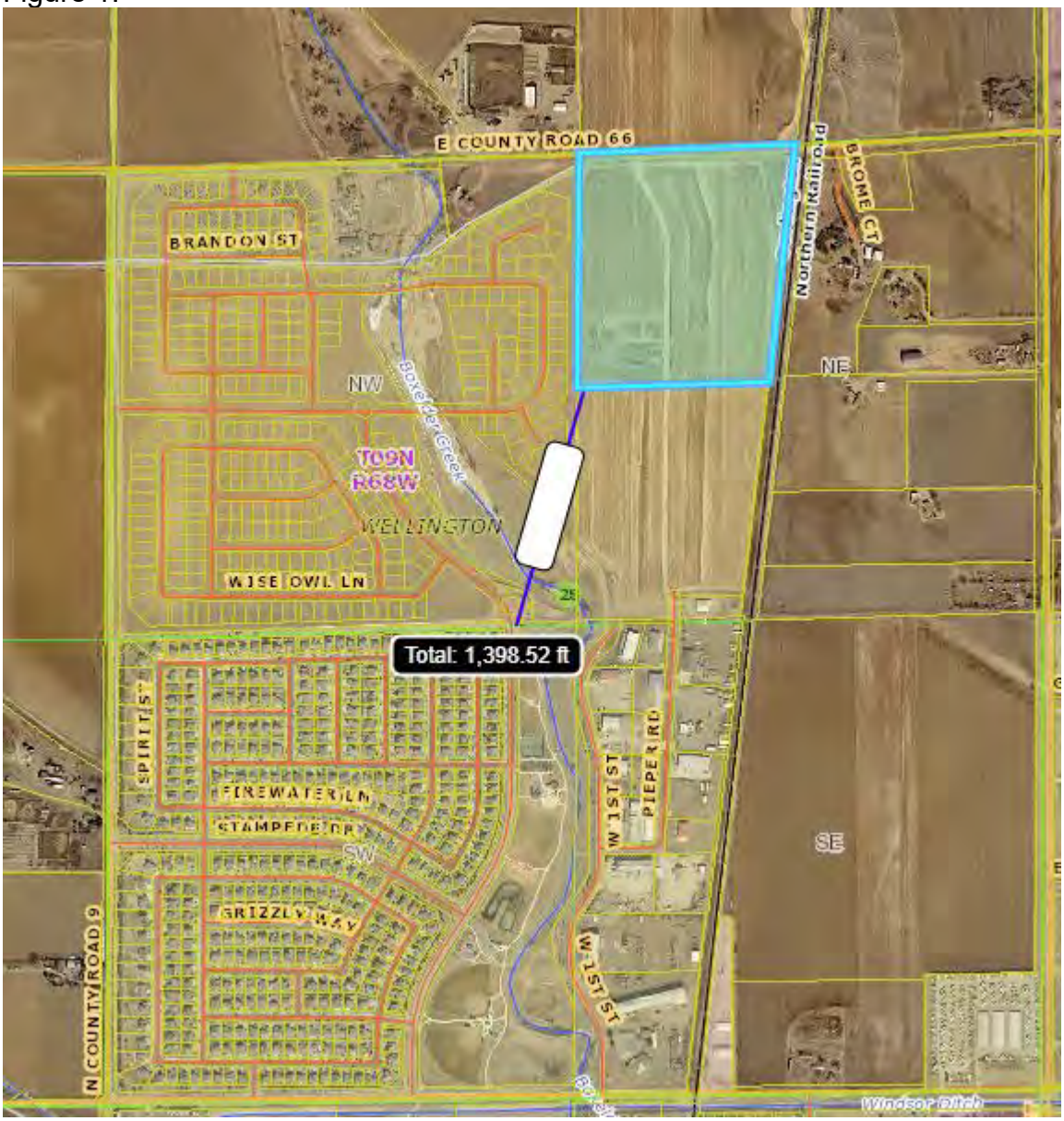
As a result of the submitted materials and meeting with Connell Resources, Inc., it is understood that Connell's existing asphalt batch plant operating near Timnath, Colorado, is proposed to be relocated to Parcel 8928000019 on East County Road 66 between North County Roads 7 and 9. The proposed improvements for the Site Plan include an office building, storage lean-to structure, welding and mechanical shop, garage, washing and fueling areas; landscaping and screening; paved parking, access and truck service roads; the relocated batch plant with associated cold storage bins, storage tanks/silos, resource stockpiles.

The operation will import and stockpile sand and aggregate resources via haul trucks for use in asphalt production, as well as process reclaimed asphalt pavement (RAP) on-site. Public utilities will supply water and sewer for new structures, while raw/well water will be transported from off-site for dust control during operations. Normal operating hours are between 7am to 6pm, Monday through Saturday with occasional work outside of normal operating hours for special projects such as evening construction for major traffic corridor infrastructure.

Though the property for the asphalt operation is zoned for I-Industrial uses under the zoning designation of Town of Wellington, there are residential uses in the area as shown in the Larimer County Assessor map shown below in Figure 1. A platted undeveloped residential community appears to be adjacent to the west and an existing developed residential community and outdoor recreational area to the south which are less than 1500 feet from the south property line of the asphalt property. The unincorporated parcels near the plant are zoned O-Open which is intended for rural

residential and agriculture uses. For this reason, it is recommended that the Town consider the residential compatibility as part of this review.

Figure 1.



Noise. Asphalt operations include noise generating activities such as road traffic, imported materials haulers, dump trucks for asphalt, off-road construction equipment with backup alarms moving aggregate resources around the site, crushing activities for RAP, conveyor belts moving material to the batch plant. For this reason noise impacts are recommended to be evaluated as part of this review process. It is not known if the Town of Wellington has a local noise ordinance, but Larimer County and the State of Colorado have standards for noise.

The County has adopted a noise ordinance (Ordinance No. 97-03) which specifies maximum sound levels of 55 dbA from 7am to 7pm at unincorporated residential

property lines as defined in the Ordinance. The ordinance is available on the County's website at: http://legacy.larimer.org/policies/noise.htm

In the absence of a Town of Wellington noise ordinance, the Colorado Revised Statute – ARTICLE 12 – Noise Abatement establishes noise levels at the property lines based on the use of adjacent properties which include residential areas except the adjacent parcel to the south which is also zoned I-Industrial.

Some site mitigations have been proposed including earthen berms of at least 10 feet to be installed along the north and west property lines; one-way haul truck movement on the site; location of noise producing activity to the northeast of the property; upgrading batch plant equipment. The Health Department recommends that the Town request a Predictive Sound Analysis with noise contour mapping to demonstrate that the proposed berms and additional mitigation strategies are adequate to protect future developed properties to the west and the existing residential uses to the north, but also to the east and the developed Buffalo Creek subdivision to the south/southeast.

It is also recommended that the operator signage include contact information such as a phone number and/or email for neighbors to report concerns directly to the operator in order to respond quicker to feedback for repairing or adjusting the noise-inducing activity.

Air Quality for Operations. Hot mix asphalt plants release air pollutants that are regulated by the Air Pollution Control Division (APCD) at the Colorado Department of Public Health and Environment (CDPHE). The primary pollutants of concern include particulate matter, carbon monoxide, nitrogen oxides, volatile organic compounds, and/or sulfur oxides. These criteria pollutants are regulated to meet the Environmental Protection Agency's National Ambient Air Quality Standards (NAAQS) which can be harmful to public health and the environment when not properly controlled. Additional noncriteria pollutants regulated by APCD include hazardous air pollutants (HAPS) as defined in the Air Quality Control Commission (AQCC) regulations..

Connell Resources, Inc. currently holds an APCD permit (00LR0746) for the asphalt batch plant proposed to be relocated to Wellington. This facility is routinely inspected by Larimer County Department of Health and Environment as contractors of APCD. A new APEN will need to be applied for and reviewed by APCD in order to establish new limitations and controls as part of the final construction (operating) permit for the new site. It is recommended that the Town request copies of the future applications and dust control plan for further evaluation on adequate controls for the residential uses.

LCDHE will continue to inspect the facility under the new air permit even within the Town of Wellington. Due to the lack of open mining on the property, aggregate material arriving pre-processed, and the current asphalt plant permit emission thresholds being in compliance with the NAAQS, it is not known if air emission dispersion modeling will be required for the future air permitting and will be evaluated by APCD at the time of APEN submittal.

To further evaluate the emission levels in relation to public health, compliance with NAAQS, and residential and recreation area compatibility, it is recommended that the

Town consider requesting emission dispersion modeling independent of the APCD permitting process to predict potential pollutant exposure. Air dispersion models are tools to approximate concentrations from one or more facilities or sources of air pollutants. When an air pollutant is emitted into the atmosphere, it is transported and dispersed by various atmospheric processes. Algorithms and equations have been developed to approximate (model) these atmospheric processes and have been incorporated into various computer codes (computer models). APCD typically uses the results from these computer models in their review of qualifying APEN/air permit applications. A modeled prediction is used to demonstrate if the emitting source will be in compliance with the NAAQS (as well as Colorado Ambient Air Quality Standards - CAAQS). If the model predicts an exceedance of the NAAQS and/or CAAQS, the applicant has the opportunity to adjust the facility emissions through operating hours, source parameters, source configuration, and other mitigation strategies in order to demonstrate compliance with all state and federal standards. Modeling is a good opportunity to examine control measures and potentially demonstrate compatibility with the residential and outdoor recreational uses.

Odors. Hot asphalt operations can produce odors depending on equipment, fuels, materials and processing. As part of compliance with the future air permit from APCD, the operation will be required to prevent excessive odors to comply with Colorado's Air Quality Control Commission Regulation 2 for Odor Emission. The regulation limits the emission of odorous air within areas used predominantly as residential or commercial purposes. This property in review is surrounded by a mix of commercial and residential uses as well as public recreation, therefore the more strict residential threshold for odors shall be complied with. Please note that it is a violation if odors are detected at property lines after the odorous air has been diluted with seven (7) or more volumes of odor free air using a nasal ranger operated by certified staff. Larimer County staff are certified in odor compliance and will evaluate complaints. Please note that compliance with APCD permitting and Regulation 2, as well as properly maintained and operating equipment will reduce the amount of emissions and therefore odors released from the property but does not create an odor-free operation.

Wetlands. No infromation was noted in the application materials regarding the intermittent waterway identified on the Larimer County Assessor's topography map. In referencing the Wetland Mapper developed by the U.S. Fish and Wildlife Service, the intermittent waterway has a preliminary identification as a riverine wetland. It is not known if there were earlier applications and/or discussions related to the topic of potential wetlands and a need for delineation.

Fugitive Dust during Construction. Colorado's air quality laws include requirements for controlling fugitive dust emissions during construction activities. Projects that are fewer than 25 acres and less than six months are not required to complete an APEN, but are still required to control fugitive dust and off-site transport. Additional information is avaible on the APCD website: https://cdphe.colorado.gov/apens-and-air-permits/air-permits-for-non-oil-gas

Water Quality. Potential water quality impacts associated with asphalt batch plants include sediments from in the truck wash down and stormwater runoff, and chemicals associated with the asphalt biding materials, fluids associated with trucks/off-road construction equipment, machinery and processing operations.

In this particular case, the submitted Ditesco drainage report indicates that a detention pond will be constructed in the southwest corner of the parcel with the intent to drain off-site. It is not known if there is a retention pond or other infrastructure to support the truck wash down area or other process water from the site.

Depending on the aforementioned process water and stormwater management, the non-extractive operations may be required to apply for either a 'Process and Stormwater Discharge Permit' or, if no process water will be discharged, a 'Stormwater Discharge Permit' from the Water Quality Control Division of the Colorado Department of Public Health and Environment. Please refer to the Water Quality Control Division's website: https://www.colorado.gov/pacific/cdphe/wq-commerce-and-industry-permits

A requirement for obtaining either permit is the preparation of a stormwater management plan. These plans must include identification of potential sources of pollution (including sediment, chemicals used in the mining operation, fuels, etc.) and selection of best management practices that will be implemented to control the potential pollutants. Under the terms of a state permit, the applicant is required to perform routine inspections and to prepare an annual report to address compliance with the stormwater management plan.

Fuel Storage Tanks. The Site Plan proposes the installation of on-site fuel storage and related pumping equipment. These items are regulated by the Colorado Department of Labor and Employment, Oil Inspection Section. Additional criteria may be required by the local fire authority. Information on their tank compliance plan submittal process is available at:
https://ops.colorado.gov/Petroleum/TankCompliance

Arsenic Compounds

Hazard Summary

Arsenic, a naturally occurring element, is found throughout the environment. For most people, exposure to arsenic, including to inorganic arsenic compounds, occurs through their diet. Acute (short-term), high-level inhalation exposure to inorganic arsenic has resulted in respiratory effects (cough, dyspnea, chest pain), gastrointestinal effects (nausea, diarrhea, abdominal pain), and central and peripheral nervous system effects. Chronic (long-term) inhalation exposure to inorganic arsenic in humans is associated with skin, cardiovascular, and neurological effects. Acute oral exposure to inorganic arsenic has resulted in effects on the digestive tract, respiratory tract, central nervous system (CNS), cardiovascular system, liver, and blood and has resulted in death. Chronic oral exposure to elevated levels of inorganic arsenic has resulted in gastrointestinal effects, anemia, peripheral neuropathy, skin lesions, hyperpigmentation, and liver and kidney damage in humans. EPA has concluded that inorganic arsenic is a human carcinogen. Evidence from human studies suggests that exposure to inorganic arsenic by inhalation may result in lung cancer, while exposure by ingestion may result in nonmelanoma skin cancer and bladder, kidney, liver, and lung cancers.

Arsine is a gas consisting of arsenic and hydrogen. It is extremely toxic to humans and can result in general malaise, headaches, apprehension, giddiness, shivering, thirst, vomiting, and abdominal pains with vomiting within a few hours of exposure. Arsine can be fatal if inhaled in sufficient quantities. EPA has not classified arsine for carcinogenicity.

Please Note:

- This fact sheet has a particular focus on inorganic arsenic compounds, including the gaseous arsenic compound arsine. The main sources of toxicity information for this fact sheet are EPA's Integrated Risk Information System (IRIS), which contains information on the carcinogenic effects of inorganic arsenic, including the unit cancer risk for inhalation exposure, and on effects of arsine; as well as the Agency for Toxic Substances and Disease Registry's (ATSDR's) Toxicological Profile for Arsenic.

Uses

- Inorganic arsenic is primarily used as a preservative to make wood resistant to rot and decay, although the use for certain residential items, such as decks and picnic tables, has been phased out. Inorganic arsenic is still used for this purpose in industrial applications. (1)
- The use of arsenic in agricultural or commercial pesticide applications has been restricted and is most recently limited to organic arsenic compounds in a limited number of approved uses. (1)
- Arsenic and its compounds have been used as alloy additives; in electronic devices, such as smartphones; in veterinary medicines; in pigment production; in glass manufacturing; as bronzing or decolorizing agents; in textile printing; in tanning; and other uses. (1,2)
- Until the 1940s, inorganic arsenic was used as a therapeutic agent in the treatment of various diseases, such as leukemia, psoriasis, and chronic bronchial asthma. Inorganic arsenic may still be used in homeopathic or folk remedies in the United States and other countries, and its use has reemerged in an FDA-approved treatment for

a specific type of leukemia. (1)

- Arsine is a gas that has much more limited usage than the other inorganic compounds. The use of arsine is primarily in electronics and semiconductor components manufacturing, organic syntheses, and lead-acid storage battery manufacturing. (2)

Sources and Potential Exposure

- Inorganic arsenic is found throughout the environment; it is released into the air by volcanoes, the weathering of arsenic-containing minerals and ores, and commercial and industrial processes. (1)
- General population exposure occurs through ingestion of contaminated drinking water or food. For most people, diet is the largest source of arsenic exposure, with smaller intakes from drinking water and air. Grains, produce, fish, and shellfish are significant sources of arsenic exposure via food. High arsenic levels have been found in fish and shellfish; however, arsenic in fish and shellfish exists primarily as two forms of organic arsenic (i.e., "fish arsenic") that are essentially nontoxic. Inorganic arsenic compounds are the predominant forms to which people are exposed. (1)
- Elevated levels of inorganic arsenic may be present in soil, either from natural mineral deposits or contamination from human activities, which may lead to dermal or ingestion exposure. (1)
- Workers at metal smelting facilities and nearby residents may be exposed to above-average inorganic arsenic levels from arsenic released into the air. (1,2)
- Other sources of inorganic arsenic exposure include burning wood treated with an arsenical wood preservative or dermal contact with wood treated with arsenic. (1)
- Arsine is formed when arsenic comes in contact with an acid. Most exposures to arsine have occurred after unintentional formation of arsine in the workplace of chemical, smelting, and refining industries. (2,9)

Assessing Personal Exposure

- Arsenic can be measured in blood, urine, hair, and fingernails. Measurement of inorganic arsenic in the urine is the best way to determine recent exposure (within the previous 1 to 2 days), while measuring inorganic arsenic in hair or fingernails can detect high-level exposures that occurred over the prior 6 to 12 months. (1)

Health Hazard Information

Acute Effects:

- Inorganic Arsenic (other than arsine)
  - Workers inhaling very high levels of arsenic over a short period have experienced respiratory tract symptoms (cough, chest pain, dyspnea, pulmonary edema), gastrointestinal effects (nausea, diarrhea, abdominal pain), and central and peripheral nervous system effects (peripheral neuropathy, frank encephalopathy). (1,2)
  - Ingestion of high levels inorganic arsenic over a short period has resulted in death. Acute oral exposure to lower levels has resulted in effects on the digestive tract (constriction of the throat, dysphagia, nausea, vomiting, watery diarrhea), respiratory tract (respiratory distress, hemorrhagic bronchitis), CNS (encephalopathy, weakness, delirium), cardiovascular system (hypotension, shock), the liver (increased enzymes and size), and blood (anemia, leukopenia). (1,2)
- Arsine
  - Inhaling high levels of arsine over very short periods has resulted in death; a half-hour exposure to 25 to 50 parts per million (ppm) can be lethal. (2,3)
  - Acute arsine poisoning can cause pulmonary edema, massive hemolysis with subsequent hemolytic anemia, and can cause kidney, liver, and heart damage. (2)
  - The major effects from short-term exposure to lower levels of arsine include headaches, vomiting,

abdominal pains, and effects on the blood, including hemolytic anemia, hemoglobinuria, and jaundice; these effects can lead to kidney failure. (2,3)

Chronic Effects (Noncancer):

- Inorganic Arsenic (other than arsine)
  - Chronic inhalation exposure of humans to elevated levels of inorganic arsenic has been associated with effects on the cardiovascular system and skin (including dermatitis, conjunctivitis, pharyngitis and rhinitis) and with nerve damage. (1,2,4)
  - EPA has not established a reference concentration (RfC) for inhalation exposure to inorganic arsenic. (4)
  - The California Environmental Protection Agency (CalEPA) has established a chronic inhalation reference exposure level (REL) of 0.000015 milligrams per cubic meter (0.000015 mg/m^3) estimated from an epidemiologic study indicating decreased intellectual function in 10-year-old children exposed to elevated arsenic in drinking water and assumptions for exposure and risk from inhalation exposure. The CalEPA REL is a concentration at or below which adverse health effects are not likely to occur. It is not a direct estimator of risk, but rather a reference point to gauge the potential effects. At lifetime exposures increasingly greater than the REL, the potential for adverse health effects increases. (4)
  - Chronic oral exposure of humans to elevated levels of inorganic arsenic has been associated with effects on the gastrointestinal system, blood, skin, eyes, lungs, heart, CNS, liver, and kidneys. Such effects include anemia, peripheral neuropathy, skin lesions, hyperpigmentation, gangrene of the extremities, vascular lesions, and liver or kidney damage. (1,4).
  - Some studies have reported an association between elevated arsenic levels in drinking water and neurocognitive or behavioral test results of school age children. (1)
  - Animal studies have reported effects on the blood, liver, and kidneys from oral exposure to inorganic arsenic. (1,4)
  - The EPA reference dose (RfD) for inorganic arsenic is 0.0003 milligrams per kilogram body weight per day (mg/kg/d) based on effects on the skin (hyperpigmentation and keratosis) and possible vascular effects reported in epidemiologic studies of exposure to contaminated drinking water . The RfD is an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious noncancer effects during a lifetime. (4)
  - EPA has medium confidence in the study on which the RfD for inorganic arsenic was based because although an extremely large number of people were included in the assessment (>40,000), the doses were not well characterized, and other contaminants were present. While extensive, the supporting human toxicity database is somewhat flawed; therefore, EPA has assigned medium confidence to the RfD. (4)

- Arsine
  - Long-term occupational exposure to arsine can damage skin and nerves and can affect the circulatory and hematopoietic systems and result in hemolytic anemia. At higher exposures, it may damage the spleen and kidney. (2, 3)
  - The EPA RfC for arsine is 0.00005 mg/m^3 based on effects on the blood and spleen, including hemolysis, abnormal red blood cell morphology, and increased spleen weight in rats, mice, and hamsters. (3)
  - EPA has assigned medium confidence to the RfC based on medium confidence in the database. While there were three inhalation animal studies and a developmental/reproductive study, there were no data available on human exposure. However, EPA has high confidence in the animal studies on which the RfC is based because the sample sizes were adequate, statistical significance was reported, concentration dose-response relationships were documented, three species were investigated, and both a no-observed-adverse-effect level (NOAEL) and a lowest-observed-adverse-effect level (LOAEL) were identified. (3)

Reproductive/Developmental Effects:

- Inorganic Arsenic
  - Studies have reported an association between maternal exposure to elevated arsenic levels in drinking water and low birth weights, neonatal death, and infant mortality. (1)
  - Ingested inorganic arsenic can cross the placenta in humans, exposing the fetus to the chemical. (1)
  - Oral animal studies have reported inorganic arsenic to produce developmental effects in offspring, including birth defects and neurobehavioral deficits. (1)

- Arsine
  - Human studies have indicated higher than expected spontaneous abortion rates in women in the microelectronics industry who were exposed to arsine. However, these studies have several limitations, including small sample size and exposure to other chemicals in addition to arsine. (3)
  - A National Toxicology Program (NTP) study found no adverse developmental effects in offspring of pregnant rats and mice exposed to arsine. (6)

Cancer Risk:

- Inorganic Arsenic
  - Human occupational studies have shown that inhalation exposure to inorganic arsenic increases the risk of lung cancer. (1,4)
  - Ingestion of inorganic arsenic in humans has been associated with an increased risk of nonmelanoma skin cancer and an increased risk of bladder, liver, kidney and lung cancers. (1,4)
  - No animal inhalation studies reporting cancer effects from inorganic arsenic exposure were identified. Most oral animal studies have not shown an association between inorganic arsenic exposure and cancer; however, a study in mice involving exposure to inorganic arsenic in drinking water reported an increased risk of lung tumors. (1)
  - EPA has concluded that inorganic arsenic is a human carcinogen. (4)
  - EPA used a mathematical model with data from an occupational study of arsenic-exposed copper smelter workers to estimate the probability of a person developing cancer from continuously breathing air containing a specified concentration of inorganic arsenic. EPA calculated an inhalation unit risk estimate of 4.3×10^{-3} per $\mu g/m^3$. EPA estimates that, if an individual were to continuously breathe air containing inorganic arsenic at an average of 0.0002 $\mu g/m^3$ (2×10^{-7} mg/m^3) over their entire lifetime, the person would theoretically have no more than a one-in-a-million increased chance of developing cancer as a direct result. Similarly, EPA estimates that continuously breathing air containing 0.002 $\mu g/m^3$ (2×10^{-6} mg/m^3) would result in not greater than a one-in-a-hundred thousand increased chance of developing cancer, and air containing 0.02 $\mu g/m^3$ (2×10^{-5} mg/m^3) would result in not greater than a one-in-ten thousand increased chance of developing cancer. For a detailed discussion of confidence in the potency estimates, please see IRIS. (4)
  - EPA has calculated an oral cancer slope factor of 1.5 per mg/kg/d for inorganic arsenic. The oral cancer slope factor is an estimate of the increased cancer risk from ingestion of 1 mg inorganic arsenic per kg body weight per day over a lifetime. (4)

- Arsine
  - EPA has not classified arsine for carcinogenicity. (3)
  - No cancer inhalation studies in humans or animals were available for arsine. (1)

Physical Properties

- Inorganic arsenic is a naturally occurring element in the earth's crust. (1)

- Pure inorganic arsenic is a gray-colored metal. Arsenic combined with elements such as oxygen, chlorine, and sulfur forms inorganic arsenic; inorganic arsenic compounds include arsenic pentoxide, arsenic trioxide, and arsenic acid. (1)
- The chemical symbol for arsenic is As, and it has a molecular weight of 74.92 g/mol. (2)
- The chemical formula for arsine is AsH_3, and it has a molecular weight of 77.95g/mol. (2)
- Arsine is an extremely flammable, colorless gas with a slight garlic-like odor. (2)
- Arsenic combined with carbon and hydrogen forms organic arsenic; organic arsenic compounds include arsanilic acid, arsenobetaine, and dimethylarsinic acid. (1)

Conversion Factors:

To convert concentrations in air (at 25 °C) from ppm to mg/m³:

mg/m³ = (ppm) × (molecular weight of the compound) / (24.45).

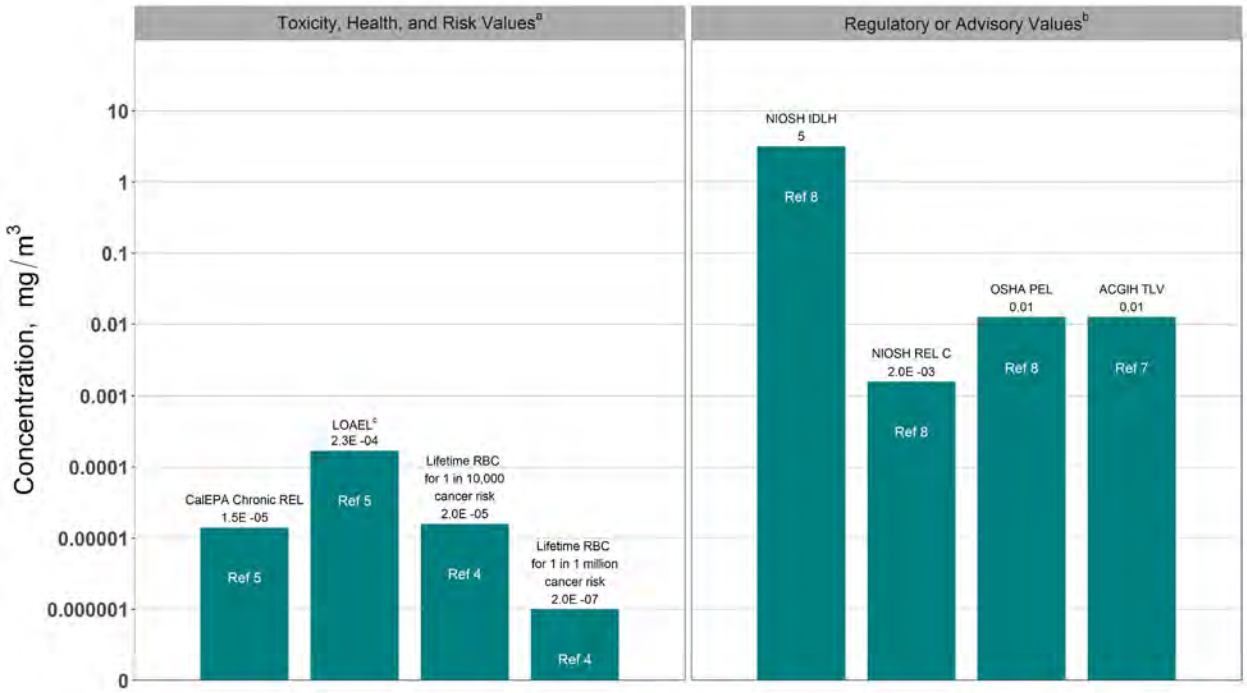
For inorganic arsenic: 1 ppm = 3.06 mg/m³.

For arsine: 1 ppm = 3.19 mg/m³

To convert concentrations in air from µg/m³ to mg/m³:

mg/m³ = (µg/m³) x (1 mg/1,000 µg)

Health Data from Inhalation Exposure (Inorganic Arsenic)



ACGIH TLV — American Conference of Governmental Industrial Hygienists threshold limit value expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effects.
LOAEL (Lowest-Observed-Adverse-Effect Level) — The lowest dose or concentration at which there was an observed toxic or adverse effect of a target organism distinguished from a normal or untreated organism of the same species.
CalEPA Chronic REL — California EPA Office of Environmental Health Hazard Assessment (OEHHA) chronic reference exposure level (REL) is the concentration at or below which no adverse health effect is anticipated for a lifetime exposure.
NIOSH IDLH — National Institute for Occupational Safety and Health's immediately dangerous to life or health concentration; IDLH values are established (1) to ensure that a worker can escape from a given contaminated environment in the event of failure of the respiratory protection equipment and (2) to indicate a maximum level

above which only a highly reliable breathing apparatus, providing maximum worker protection, is permitted.

NIOSH REL C (ceiling value) — NIOSH's recommended exposure limit ceiling; the concentration that should not be exceeded at any time.

OSHA PEL — Occupational Safety and Health Administration's permissible exposure limit expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effect, averaged over a normal 8-hour workday or a 40-hour workweek.

RBC (cancer risk-based concentration) — A calculated concentration of a chemical in air to which continuous exposure over a lifetime is estimated to be associated with a risk of contracting cancer not greater than the specified probability (e.g., 1-in-1 million).

[a]Toxicity, Health, and Risk numbers are toxicological values from animal testing or risk assessment values developed by EPA.

[b]Regulatory numbers are values that have been incorporated in Government regulations, while advisory numbers are nonregulatory values provided by Government or other groups as advice. OSHA numbers are regulatory, whereas NIOSH, ACGIH, and AIHA numbers are advisory.

[c]The concentration presented here is the LOAEL (calculated from the oral level) from the critical study used as the basis for the CalEPA chronic REL.

Summary updated April 2021.

References

1. Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profile for Arsenic. U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 2007. And Addendum to the Toxicological Profile for Arsenic. U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 2016. https://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=22&tid=3
2. Pohanish, R.P. Sittig's Handbook of Toxic and Hazardous Chemicals and Carcinogens. Seventh Edition. Elsevier Inc. Oxford, UK and Cambridge, MA USA. 2017. https://www.elsevier.com/books/sittigs-handbook-of-toxic-and-hazardous-chemicals-and-carcinogens/pohanish/978-0-323-38968-6
3. U.S. Environmental Protection Agency. Integrated Risk Information System (IRIS) on Arsine. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. Last revised 3/01/1994. https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=672
4. U.S. Environmental Protection Agency. Integrated Risk Information System (IRIS) on Arsenic. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. Last revised 9/01/1991. https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=278
5. California Environmental Protection Agency (CalEPA). Technical Support Document for the Determination of Noncancer Chronic Reference Exposure Levels. Office of Environmental Health Hazard Assessment, Berkeley, CA. 2008 (updated July 2014). https://oehha.ca.gov/media/downloads/crnr/appendixd1final.pdf
6. National Toxicology Program. 1990. Abstract for TER87038. Arsine: Absence of Developmental Toxicity in Rats and Mice. https://ntp.niehs.nih.gov/testing/types/dev/abstracts/ter87038/ter87038.html
7. American Conference of Governmental Industrial Hygienists (ACGIH). 2021 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents. Biological Exposure Indices. Cincinnati, OH. 2021. https://www.acgih.org/science/tlv-bei-guidelines/
8. National Institute for Occupational Safety and Health (NIOSH). Pocket Guide to Chemical Hazards. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. Cincinnati, OH. 2020. http://www.cdc.gov/niosh/npg/
9. National Center for Environmental Health. Centers for Disease Control and Prevention. Cincinnati, OH. 2018. https://emergency.cdc.gov/agent/arsine/facts.asp

Acetaldehyde

75-07-0

Hazard Summary

Acetaldehyde is mainly used as an intermediate in the synthesis of other chemicals. It is ubiquitous in the environment and may be formed in the body from the breakdown of ethanol. Acute (short-term) exposure to acetaldehyde results in effects including irritation of the eyes, skin, and respiratory tract. Symptoms of chronic (long-term) intoxication of acetaldehyde resemble those of alcoholism. Acetaldehyde is considered a probable human carcinogen (Group B2) based on inadequate human cancer studies and animal studies that have shown nasal tumors in rats and laryngeal tumors in hamsters.

Please Note: The main sources of information for this fact sheet are EPA's Health Assessment Document for Acetaldehyde (1) and the Integrated Risk Information System (IRIS) (4), which contains information on inhalation chronic toxicity of acetaldehyde and the RfC. Other secondary sources include the International Agency for Research on Cancer (IARC) Monographs on Chemicals Carcinogenic to Humans. (6)

Uses

- The predominant use of acetaldehyde is as an intermediate in the synthesis of other chemicals. (1)
- Acetaldehyde is used in the production of perfumes, polyester resins, and basic dyes. Acetaldehyde is also used as a fruit and fish preservative, as a flavoring agent, and as a denaturant for alcohol, in fuel compositions, for hardening gelatin, and as a solvent in the rubber, tanning, and paper industries. (1,2)

Sources and Potential Exposure

- Acetaldehyde is ubiquitous in the ambient environment. It is an intermediate product of higher plant respiration and formed as a product of incomplete wood combustion in fireplaces and woodstoves, coffee roasting, burning of tobacco, vehicle exhaust fumes, and coal refining and waste processing. Hence, many individuals are exposed to acetaldehyde by breathing ambient air. It should be noted that residential fireplaces and woodstoves are the two highest sources of emissions, followed by various industrial emissions. (1)
- In Los Angeles, California, levels of acetaldehyde up to 32 parts per billion (ppb) have been measured in the ambient environment. (1)
- Exposure may also occur in individuals occupationally exposed to acetaldehyde during its manufacture and use. (1,2)
- In addition, acetaldehyde is formed in the body from the breakdown of ethanol; this would be a source of acetaldehyde among those who consume alcoholic beverages. (1)

Assessing Personal Exposure

- Acetaldehyde can be detected in the blood and breath to determine whether or not exposure has occurred. (12)

Health Hazard Information

Acute Effects:

- The primary acute effect of inhalation exposure to acetaldehyde is irritation of the eyes, skin, and

respiratory tract in humans. At higher exposure levels, erythema, coughing, pulmonary edema, and necrosis may also occur. (1)
- Acute inhalation of acetaldehyde resulted in a depressed respiratory rate and elevated blood pressure in experimental animals. (1)
- Tests involving acute exposure of rats, rabbits, and hamsters have demonstrated acetaldehyde to have low acute toxicity from inhalation and moderate acute toxicity from oral or dermal exposure. (3)

Chronic Effects (Noncancer):
- Symptoms of chronic intoxication of acetaldehyde in humans resemble those of alcoholism. (5)
- In hamsters, chronic inhalation exposure to acetaldehyde has produced changes in the nasal mucosa and trachea, growth retardation, slight anemia, and increased kidney weight. (1,4)
- The Reference Concentration (RfC) for acetaldehyde is 0.009 milligrams per cubic meter (mg/m^3) based on degeneration of olfactory epithelium in rats. The RfC is an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups), that is likely to be without appreciable risk of deleterious noncancer effects during a lifetime. It is not a direct esimator of risk but rather a reference point to gauge the potential effects. At exposures increasingly greater than the RfC, the potential for adverse health effects increases. Lifetime exposure above the RfC does not imply that an adverse health effect would necessarily occur. (4)
- EPA has medium confidence in the principal studies because appropriate histopathology was performed on an adequate number of animals and a no-observed-adverse-effect level (NOAEL) and a lowest-observed-adverse-effect level (LOAEL) were identified, but the duration was short and only one species was tested; low confidence in the database due to the lack of chronic data establishing NOAELs and due to the lack of reproductive and developmental toxicity data; and, consequently, low confidence in the RfC. (4)
- EPA has not established a Reference Dose (RfD) for acetaldehyde. (4)

Reproductive/Developmental Effects:
- No information is available on the reproductive or developmental effects of acetaldehyde in humans.
- Acetaldehyde has been shown, in animals, to cross the placenta to the fetus. (1,4)
- Data from animal studies suggest that acetaldehyde may be a potential developmental toxin. In one study, a high incidence of embryonic resorptions was observed in mice injected with acetaldehyde. In rats exposed to acetaldehyde by injection, skeletal malformations, reduced birth weight, and increased postnatal mortality have been reported. (1,6)

Cancer Risk:
- Human data regarding the carcinogenic effects of acetaldehyde are inadequate. Only one epidemiology study is available that has several limitations including short duration, small number of subjects, and concurrent exposure to other chemicals and cigarettes. (1,4,6)
- An increased incidence of nasal tumors in rats and laryngeal tumors in hamsters has been observed following inhalation exposure to acetaldehyde. (1,4,6)
- EPA has classified acetaldehyde as a Group B2, probable human carcinogen. (1,4)
- EPA uses mathematical models, based on human and animal studies, to estimate the probability of a person developing cancer from breathing air containing a specified concentration of a chemical. EPA calculated an inhalation unit risk of 2.2×10^{-6} $(\mu g/m^3)^{-1}$. EPA estimates that, if an individual were to continuously breathe air containing acetaldehyde at an average of 0.5 $\mu g/m^3$ (5×10^{-4} mg/m^3) over his or her entire lifetime, that person would theoretically have no more than a one-in-a-million increased chance of developing cancer as a direct result of breathing air containing this chemical. Similarly, EPA estimates that breathing air containing 5.0 $\mu g/m^3$ (5×10^{-3} mg/m^3) would result in not greater than a one-in-a-hundred thousand increased chance of developing cancer, and air containing 50.0 $\mu g/m^3$ (5×10^{-2} mg/m^3) would result in not greater than a one-in-ten thousand increased chance of developing cancer. For a detailed discussion of confidence in the potency estimates, please see IRIS. (4)

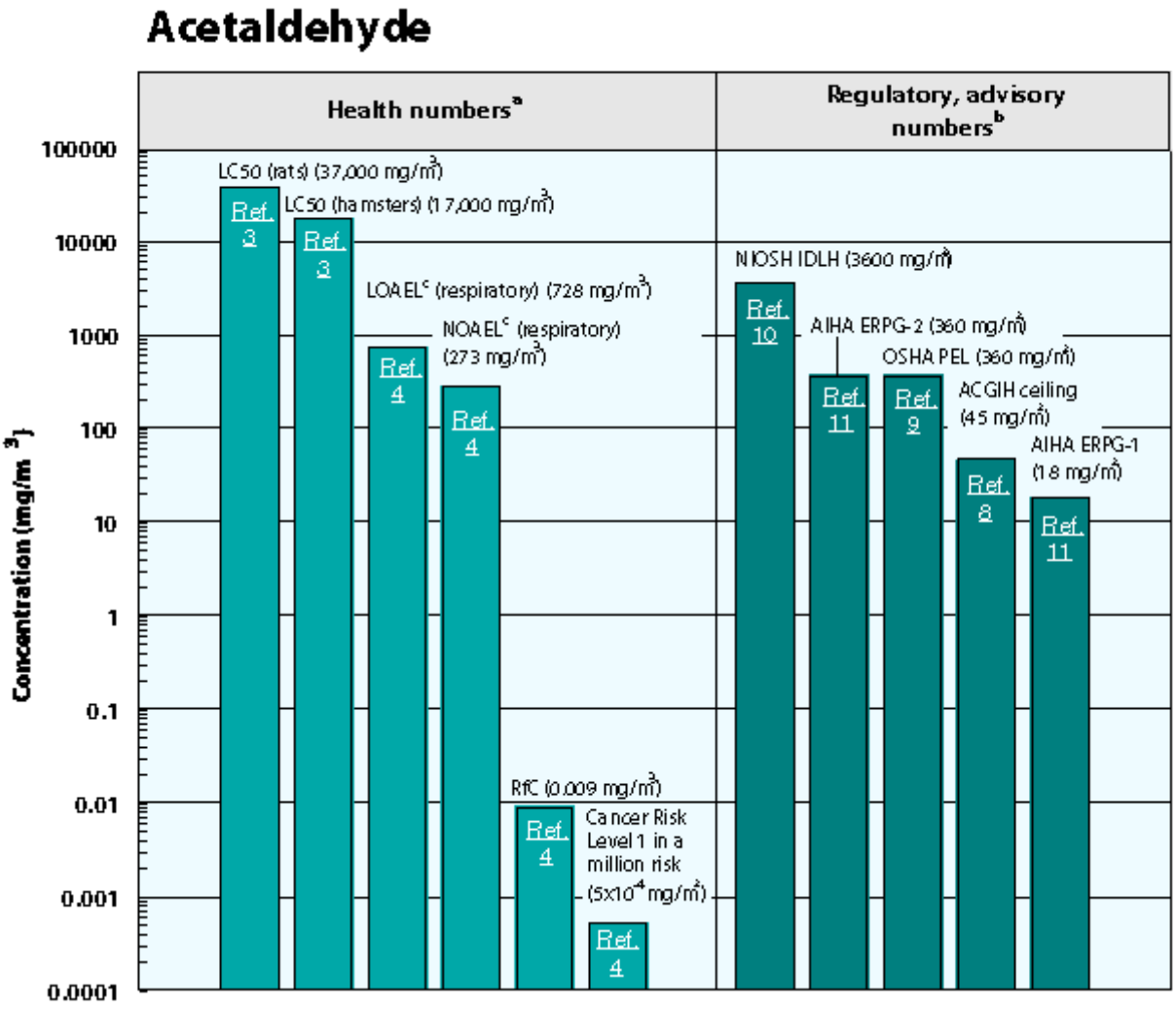
Physical Properties

- The chemical formula for acetaldehyde is CH_3CHO, and it has a molecular weight of 44.06 g/mol. (1)
- Acetaldehyde is a colorless mobile liquid that is flammable and miscible with water. (1,6)
- Acetaldehyde has a pungent suffocating odor, but at dilute concentrations it has a fruity and pleasant odor. The odor threshold of acetaldehyde is 0.05 parts per million (ppm) (0.09 mg/m^3). (1,7)
- The vapor pressure for acetaldehyde is 740 mm Hg at 20 °C, and it has a log octanol/water partition coefficient (log K_{ow}) of 0.43. (1)

Conversion Factors (only for the gaseous form):

To convert concentrations in air (at 25°C) from ppm to mg/m^3: mg/m^3 = (ppm) × (molecular weight of the compound)/(24.45). For acetaldehyde: 1 ppm = 1.8 mg/m^3. To convert concentrations in air from $\mu g/m^3$ to mg/m^3: mg/m^3 = ($\mu g/m^3$) × (1 mg/1,000 µg).

Health Data from Inhalation Exposure



AIHA ERPG--American Industrial Hygiene Association's emergency response planning guidelines. ERPG 1 is the maximum airborne concentration below which it is believed nearly all individuals could be exposed up to one hour without experiencing other than mild transient adverse health effects or perceiving a clearly defined objectionable odor; ERPG 2 is the maximum airborne concentration below which it is believed nearly all individuals could be exposed up to one hour without experiencing or developing irreversible or other serious health effects that could impair their abilities to take protective action.

ACGIH ceiling-- American Conference of Governmental and Industrial Hygienists' threshold limit value ceiling; the concentration of a substance that should not be exceeded during any part of the working exposure.
LC_{50} (Lethal Concentration $_{50}$)--A calculated concentration of a chemical in air to which exposure for a specific length of time is expected to cause death in 50% of a defined experimental animal population.
NIOSH IDLH --National Institute of Occupational Safety and Health's immediately dangerous to life or health limit; NIOSH recommended exposure limit to ensure that a worker can escape from an exposure condition that is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from the environment.
OSHA PEL --Occupational Safety and Health Administration's permissible exposure limit expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effect averaged over a normal 8-h workday or a 40-h workweek.

The health and regulatory values cited in this factsheet were obtained in December 1999.
[a] Health Numbers are toxicological numbers from animal testing or risk assessment values developed by EPA.
[b] Regulatory numbers are values that have been incorporated in Government regulations, while advisory numbers are nonregulatory values provided by the Government or other groups as advice. OSHA numbers are regulatory, whereas NIOSH, ACGIH, and AIHA numbers are advisory.
[c] The LOAEL and NOAEL are from the critical study used as the basis for the EPA RfC.

Summary created in April 1992, updated in January 2000

References

1. U.S. Environmental Protection Agency. Health Assessment Document for Acetaldehyde. EPA/600/8-86-015A. Environmental Criteria and Assessment Office, Office of Health and Environmental Assessment, Office of Research and Development, Research Triangle Park, NC. 1987.
2. M. Sittig. Handbook of Toxic and Hazardous Chemicals and Carcinogens. 2nd ed. Noyes Publications, Park Ridge, NJ. 1985.
3. U.S. Department of Health and Human Services. Registry of Toxic Effects of Chemical Substances (RTECS, online database). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
4. U.S. Environmental Protection Agency. Integrated Risk Information System (IRIS) on Acetaldehyde. National Center for Environmental Assessment, Office of Research and Development, Washington, D.C. 1999.
5. The Merck Index. An Encyclopedia of Chemicals, Drugs, and Biologicals. 11th ed. Ed. S. Budavari. Merck and Co. Inc., Rahway, NJ. 1989.
6. International Agency for Research on Cancer (IARC). IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans: Allyl Compounds, Aldehydes, Epoxides and Peroxides. Volume 36. World Health Organization, Lyon. 1985.
7. J.E. Amoore and E. Hautala. Odor as an aid to chemical safety: Odor thresholds compared with threshold limit values and volatilities for 214 industrial chemicals in air and water dilution. Journal of Applied Toxicology, 3(6):272-290. 1983.
8. American Conference of Governmental Industrial Hygienists (ACGIH). 1999 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents, Biological Exposure Indices. Cincinnati, OH. 1999.
9. Occupational Safety and Health Administration (OSHA). Occupational Safety and Health Standards, Toxic and Hazardous Substances. Code of Federal Regulations. 29 CFR 1910.1000. 1998.
10. National Institute for Occupational Safety and Health (NIOSH). Pocket Guide to Chemical Hazards. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. Cincinnati, OH. 1997.
11. American Industrial Hygiene Association (AIHA). The AIHA 1998 Emergency Response Planning Guidelines and Workplace Environmental Exposure Level Guides Handbook. 1998.
12. U.S. Department of Health and Human Services. Hazardous Substances Data Bank (HSDB, online database). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.

Print

Planning Commission May 1, 2023 Public Comment - Submission #3070

Date Submitted: 4/28/2023

First and Last Name*

Sarah Mickschl

Email Address*

sarahmickschl@gmail.com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

6915 GRASSY RANGE DR

Public Comment for the Planning Commission May 1, 2023 Meeting

I am strongly against the decision to approve the Asphalt Plant from being built at the current location within Wellington town limits. 1.Â The town of Wellington was re-zoned in 2022 with the land that Connell Resources Â wants to develop zoned as Heavy Industrial.Â As Wellington was re-zoned, Heavy Industrial land came with setback requirements of 1000ft linear and 45ft height restrictions.Â The claim by Connell Resources that the land is not suitable for Heavy Industrial use with current setbacks should have led town planners to decide that this property should be re-zoned to Light Industrial to limit the setback needs.Â The need for a greater setback of 2640ft is actually more appropriate given the language in the Land Use Code Section 4.03.21 B curating toxic chemicals.Â Especially since it is adjacent to a residential neighborhood, a park and school.Â Additionally, the asphalt plant will not only impact the nearby neighborhoods, but our entire small town as the air quality will be impacted. 2.Â As a homeowner, teacher and involved member of ourÂ community I have issues with the lack of informed decision making to grant the setback variance as well.Â It does not appear the town of Wellington has done any environmental (air quality, water quality and quantity, soil erosion and discharge), traffic impact, view shed impacts, noice, environmental justice for underserved communities, or economic impacts analysis that this will have on the health and safety of Wellington residents and wildlife such as migrating birds.Â The town must clearly understand and communicate to the public, the risks and/or benefits associated with the Asphalt Plant. This has yet to have been completed. Â Based on other locations where Asphalt Plants are located near neighborhoods, property values decreased 56% according to Blue Ridge Environmental Defense League (BREDL).Â BREDL also found that 45% of residents living within a half mile of a new asphalt plant reported a deterioration of their health, which began after the plant opened.Â Â Known toxins also come with an Asphalt Plant such as odor, formaldehyde, hexane, phenol, polycyclic organic matter, and toluene. The CDCâ€™s National Institute for Occupational Safety & Health states, â€œKnown carcinogens have been found in asphalt fumes generated at work sites.â€* Exposure to these air toxins may cause cancer, central nervous system problems, liver damage, respiratory problems, and skin irritation (EPA Asphalt Plant Emission Assessment Report 2000). As a mother and teacher, it seems very irresponsibleÂ of the Council not to have the health and safety of its residents as its first and foremost priority. It is also stated in the Land Use Code, Section 1.01.1Â and Section 4.03.21, that the sole purpose of the code is for the health and safety of its residents. Clearly, theÂ Asphalt Plant violates the Land Use Code and should not be approved.Â Â The town of Wellington has a number of human health and safety issues to deal with currently, they do not need to add another issue. The responsibility of the Town of Wellington and its elected representatives is the health, safety, and well being of its residents.Â If this asphalt plant is approved, the town is falling far short of this responsibility. Â 3.Â The economic impact on the residents and the town will be noticeable.Â Residents will lose property value and will likely look to move out of town.Â With issues Wellington is already trying to deal with (train crossings, water quality, water price, concentrated feed lots, close proximity to the highway), this will likely be the final thing to tilt residents to leave.Â Businesses will also likely leave and close as their consumers will leave town. Â 4.Â There are certainly better locations for the Asphalt Plant to be located.Â Connell Resources likes to mention that homes have been built in Fort Collins next to their plants, however that is a homeowners decision.Â With this approval in Wellington, homeowners were not able to make a decision to live next to an Asphalt Plant, the town of Wellington is poorly making that decision for them.Â As elected officials, you must stand up for your constituents. There are large swaths of county land in Larmier and Weld where this could be located away from residential areas.Â Connell Resources claims that the counties don't want the Asphalt Plants, but there is a process to get those approved there.Â There are also areas within Weld County where these plants are welcomed. Connell Resources also claimed that they could open in Carr (where they get their aggregate) but its too cold and windy for transporting.Â There are common mitigations such as lining and insulating trucks for transport.Â These plants exist in far colder places than the Front Range of Colorado. It's time for the town of Wellington to STOP being Fort Collins' dumping ground. Thank you for taking comments and I trust the right decision will be made regarding the health, safety, and viability of residents and the town of Wellington. Sarah Mickschl

Optional File Attachment

-Land Use Code-ADOPTED.pdf

Optional File Attachment

Choose File | No file selected

Optional File Attachment

Choose File | No file selected

Written Public Comments
3:00pm 5/30/2023

Proposed Asphalt Plant

Ken Ferrier <kmfkona@gmail.com>
Sat 4/29/2023 7:54 AM

To: Cody Bird <birdca@wellingtoncolorado.gov>

Mr. Bird,
This message contains my thoughts on the proposed asphalt plant. I have previously submitted them to the Planning Council via the Wellington Town website. More recently I am finding information directing concerned citizens to send their comments directly to you at this email address. I apologize if this proves redundant.

The proposed asphalt plant would be in direct contradiction to the stated **PURPOSE (Article 1.01.1)** of the Wellington Land Use Code (WLUC). Specifically, the asphalt plant would NOT ***"enhance the Town's small-town character"*** nor would it ***"further the residents' goals as identified in the Comprehensive Plan"*** (with the exception, perhaps, of some increased revenues). If you disagree, please show us what goals would be furthered by the plant.

Furthermore, an asphalt plant in the proposed location would stand in opposition to several of the specific stated purposes for which the WLUC was adopted. The WLUC states that the zoning regulations contained therein are designed to:

1.01.1, A - ***Promote the health, safety, values, and general welfare of Town residents.***
How would the asphalt plant with its emissions, truck traffic, noise, and negative aesthetics achieve any of those foundational goals? Rather, it would seem designed to do just the opposite.

1.01.1, C - ***Ensure adequate provision of transportation, water supply, sewage disposal, schools, parks, and other public improvements.***
We are painfully aware of the water supply issues facing our community. How can an asphalt plant do anything but add to the burden of an already over-taxed (and over-priced) system?

1.01.1, H - ***Prevent...danger and congestion in travel and transportation, and any other use or development that might be detrimental to the stability and livability of the Town.***
Wellington residents are all too familiar with the traffic congestion that occurs at the I-25 on-ramps and off-ramps, as well as the traffic signal at the East Frontage Rd. At certain times of day the intersection at N. County Rd. 7 (6th Street) and Cleveland Ave. gets really backed up. I have had to wait through multiple cycles of the traffic light, especially when turning left. There is also a concern for the present school zone near Eyestone Elementary School and Wellington Middle School. Those roads are often clogged with school buses and other vehicles belonging to parents who are dropping off or picking up students. Adding a steady flow of asphalt trucks to the situation can only heighten the level of congestion and the likelihood of danger to vehicles and pedestrian students alike. Wouldn't that be "detrimental to the stability and livability of the Town"?

I respectfully urge you to act in the best interests of ALL the residents of our community and keep the asphalt plant out. Thank you!

Ken Ferrier
Buffalo Creek resident

Written Public Comments
3:00pm 5/30/2023

Asphalt plant in Wellington

Carolynn McGahey <cgmcgahey@hotmail.com>

Sat 4/29/2023 9:21 AM

To: Cody Bird <birdca@wellingtoncolorado.gov>

Very much opposed to this location. I am sure it's cheaper for them as the infrastructure is in place. However it is too close to the new school and neighborhoods. It will cause disruption and air quality and noise issues. No matter what they say. They belong out in areas that are not slated to become communities.
Thank you for letting me express my opinion.

Carolynn McGahey
2201 Antelope Racer Ct
Wellington CO

Written Public Comments
3:00pm 5/30/2023

Hot asphalt plant

Katherine Andersen <katerandersen@gmail.com>
Sun 4/30/2023 9:40 PM

Hello,

I am opposed to the Connell Resources asphalt plant proposed in Wellington, Colorado. An environmental study and a study on the impact on home values should be done prior to any new factories. This is especially crucial as the planned plant is near the community park and a school. If nothing else, a different location further from town should be considered.

Thank you,

Kate Andersen
Sage Meadows, Wellington resident

Written Public Comments
3:00pm 5/30/2023

Re: Vote NOT to Approve Asphalt Plant

Stacie Magruder <staciemagruder@gmail.com>

Sun 4/30/2023 6:20 PM

To: Cody Bird <birdca@wellingtoncolorado.gov>;JKefalas@larimer.org <JKefalas@larimer.org>;janice.marchman.senate@coleg.gov <janice.marchman.senate@coleg.gov>

Thank you.

On Sun, Apr 30, 2023, 6:09 PM Stacie Magruder <staciemagruder@gmail.com> wrote:

> Janice and John,
>
> I want to bring your attention to concerns from Wellington residents around Connell Resources proposal to build an asphalt plant next to our community park. Along with most residents, I oppose the plan. The physical and financial health of its residents should be the first priority. I ask for your support in preventing the build of the plant.
>
> Please see email below to the Planning Director Corey Bird.
>
> Thank you for your time and consideration in this matter.
>
> Stacie Magruder
>
> On Sun, Apr 30, 2023, 5:49 PM Stacie Magruder <staciemagruder@gmail.com> wrote:
>
> > Mr. Bird,
> >
> > The reasons to not approve the plant are obvious. I understand there hasn't been an environmental study and asphalt plants are known for releasing toxic chemicals. Connell does not have a plan for spills and will bring a level of traffic that is not managable for Wellington. I would like to understand what you are going to do to protect the towns health and to protect the property values of its residents. Please put your constituents first. The management of water, utilities, etc. has been poorly managed for us and this is an opportunity to make a choice to positively impact tax payers in Wellington.
> >
> > I ask you to please vote no.
> >
> > Thank you.
> >
> > Stacie Magruder

Written Public Comments
3:00pm 5/30/2023

Opposition to Asphalt Plant

Dave <dave69337@gmail.com>

Mon 5/1/2023 1:16 PM

To: Cody Bird <birdca@wellingtoncolorado.gov>;janice.marchman.senate@coleg.gov <janice.marchman.senate@coleg.gov>;jkefalas@larimer.org <jkefalas@larimer.org>

Hello,

I am opposed to the Connell Resources asphalt plant proposed in Wellington, Colorado. An environmental study and a study on the impact on home values should be done prior to any new factories. This is especially crucial as the planned plant is near the community park and a school. If nothing else, a different location further from town should be considered.

Thank you,

David Andersen
Wellington resident

Online Form Submittal: Contact the Planning and Building Department

noreply@civicplus.com <noreply@civicplus.com>
Mon 5/1/2023 12:54 PM
To: TOW Building <Building@wellingtoncolorado.gov>

Contact the Planning and Building Department

Acknowledgement	I agree
First Name	Carrie
Last Name	Browning
Property Address Related to Question	6848 MEADOW RAIN WAY
City	Wellington
State	co
Zip Code	80549
Email Address	john.carrie@verizon.net
Phone Number	12144601093
Preferred contact method?	Email
Are you the homeowner, contractor, business, or other related to this project?	Homeowner
What is the zoning district for the location you have questions about? If you are unsure please utilize the zoning district map to the right.	I - Industrial
Discover Your Zoning District	Zoning District Map
I have a question regarding...	Other
What specific questions do you have? Please provide any relevant information.	I am not sure where to go or whom to contact, but I am totally against an asphalt plant here in Wellington. I am sure you are very interested in the tax you can collect, but I have a feeling there are several other things this town should be concerned about at this time. I moved from a town in Texas that was this size and the growth was well thought out to accommodate its citizens.

	Thank you, Carrie Browning
Helpful Documents	*Field not completed.*

Email not displaying correctly? View it in your browser.

Written Public Comments
3:00pm 5/30/2023

Stopping Asphalt Plant

M.E. Cahill <doc_critter@yahoo.com>

Mon 5/1/2023 11:20 AM

To: Cody Bird <birdca@wellingtoncolorado.gov>

To Whom It May Concern;

I am in opposition of the Asphalt Plant being moved here. It is one thing to get inundated with country smells of cows when the wind blows right but quite another with the industrial chemical smells of this type of Plant. I suffer from lung disease and it is the last thing I want to deal with is the health issues to our air quality. I request that we take into consideration the impact would have on our citizens and the air quality we appreciate living here.

Mary

Mary E. Cahill
Resident of Wellington, CO

Sent from Yahoo Mail on Android

Written Public Comments
3:00pm 5/30/2023

Asphalt planning meeting

Maureen Conkling <m.e.conkling@gmail.com>

Mon 5/1/2023 12:23 PM

To: Cody Bird <birdca@wellingtoncolorado.gov>

Hi, I am a Wellington resident and I am hearing the news about the asphalt plant.

Why are they moving it from Timnath? Has someone gone to Timnath to see what it is like, the odors, the noise, the truck traffic? What do the Timnath people think about having it close by?

Why would Wellington want a plant like this? Are there any benefits to the town?

There is already an ozone problem here so we don't need more pollution. What environment and health effects are possible? What about the pollution and noise from all the truck traffic?

Maybe it is just too close to a residential area and park for people who move here to get away from those issues.

It doesn't sound like most people want the plant here, so the leaders should listen to the residents concerns.

Thanks,
Maureen Conkling

Written Public Comments
3:00pm 5/30/2023

FW: Online Form Submittal: Contact Your Board of Trustees

Patti Garcia <garciapa@wellingtoncolorado.gov>
Mon 5/1/2023 4:33 PM
To: Kaufmanc15@gmail.com <Kaufmanc15@gmail.com>
Cc: **Board of Trustees <boardoftrustees@wellingtoncolorado.gov>**;Cody Bird <birdca@wellingtoncolorado.gov>

Mr. Kaufman –

Thank you for your email. The email you sent was to the Board of Trustees; the Planning Commission is a separate advisory board which will be considering the site plan for Connell Resources. Appeals of decisions made by the Planning Commission are made to the Board of Trustees so the Mayor and Trustees are not permitted to comment on this item as it could be considered ex-parte communications if there is an appeal.

I wanted to respond so that you understood why the Mayor and Trustees did not reply to your email. You can view the May 1, 2023 Planning Commission packet at this link https://www.wellingtoncolorado.gov/Archive.aspx?AMID=56.

Patti

TOWN OF WELLINGTON

Patti Garcia
Town Administrator
Mobile: (970) 473-6033
Email: garciapa@wellingtoncolorado.gov
Web: www.wellingtoncolorado.gov
8225 3rd Street, Wellington, CO 80549

From: noreply@civicplus.com <noreply@civicplus.com>
Sent: Monday, May 1, 2023 4:29 PM
To: Patti Garcia <garciapa@wellingtoncolorado.gov>; Kelly Houghteling <houghtkm@wellingtoncolorado.gov>; Calar Chaussee <chausseec@wellingtoncolorado.gov>; Ashley Macdonald <macdonas@wellingtoncolorado.gov>; Jon Gaiter <gaiterjm@wellingtoncolorado.gov>; Rebekka Dailey <daileyrm@wellingtoncolorado.gov>; Brian Mason <masonb@wellingtoncolorado.gov>; Shirrell Tietz <tietzs@wellingtoncolorado.gov>; David Wiegand <wiegandd@wellingtoncolorado.gov>
Subject: Online Form Submittal: Contact Your Board of Trustees

Contact Your Board of Trustees

First and Last Name	Cory Kaufman
Email Address	Kaufmanc15@gmail.com
Phone Number	619 890 1863
Address or Subdivision	Sage Meadows

Written Public Comments 3:00pm 5/30/2023

Message for the Board of Trustees	Good afternoon, I am sending this message in strong opposition to the proposed Connell Asphalt plant. I am in the construction industry myself and understand the importance of these building materials. However this location, in my mind is a no brainer terrible idea. Reading through the proposed plan and through some of the laws this is quite clearly an extreme grey line. There are many locations that are more suitable for these operations. Wellington is a growing and flourishing town and doing something to harm the health and Saftey of the residents is an awful thing to do. There is a quite clear right answer here and I ask that you do the right thing. So let's get it done and find a different location and keep Wellington a great place to live ! Thank you

Email not displaying correctly? View it in your browser.

Written Public Comments
3:00pm 5/30/2023

Asphalt plant

Annie Lindgren <annie.e.lindgren@gmail.com>

Mon 5/1/2023 3:00 PM

To: Cody Bird <birdca@wellingtoncolorado.gov>

Hey Cody,

Hope all is well! I am reaching out to share concerns regarding the asphalt plant. I wanted to do research, but haven't had time. I would advocate for environment and health studies to be shared. It sounds like not a lot of research has been done on the health & environmental side of it. I would hate for the asphalt plant be added to the community, and then decrease the value of our homes, and negatively impact the air quality. Really thinking more of Wellington as it continues growing. We know it is cheaper now, and thus more attractive to these types of businesses. But, then the future of Wellington has an asphalt plant in the center of it.

Just want to make sure all these health things are being taken into consideration! Already have the cow manure air to breath during walks.

Thank you,
Annie Lindgren
3746 Franklin Ave
Wellington, CO 80549

Written Public Comments
3:00pm 5/30/2023

Fwd: Wellington Asphalt Plant

Stacie Magruder <staciemagruder@gmail.com>
Mon 5/1/2023 4:03 PM
To: Cody Bird <birdca@wellingtoncolorado.gov>

1 attachments (208 KB)
Final Wellington Letter 51.pdf;

Hello,

Please see the email and attached letter I received from our State Senator Janice Marchman this afternoon.

Thank you.

---------- Forwarded message ---------
From: **Sam Maddux** <sam@janiceforcolorado.com>
Date: Mon, May 1, 2023 at 3:10 PM
Subject: Wellington Asphalt Plant - Senator Marchman Response
To: Sam Maddux <sam@janiceforcolorado.com>

Hello!

Thank you for reaching out regarding the potential asphalt plant in Wellington. I wanted to share with you the letter Senator Marchman sent to the Board of Trustees and Planning Commission. Our office would not have been aware of this issue without your outreach, thank you for bringing it to our attention.

Again, thank you so much for reaching out, it is truly our honor to listen to and serve the constituents of Senate District 15. Please feel free to reach out again with any future comments or questions.

Best,
Sam
--
Sam Maddux (He/Him)
Legislative Aide | Senator Marchman
C: (303) 763-0183
E: sam@janiceforcolorado.com

JANICE MARCHMAN
SENATE DISTRICT 15
State Senator
200 E. Colfax Avenue
Denver, Colorado 80203
Capitol: (303) 866-4878

COMMITTEES
Vice Chair – Senate Committee on Education
Committee on Agriculture and Natural Resources

Town of Wellington Board of Trustees and Planning Commission Members,

I am writing to you today regarding a matter that has been brought to my attention by numerous constituents in Wellington. I have received significant outreach regarding the planned asphalt plant that is set to be built near our community park and school. Many constituents have expressed their concern that an environmental study and a study on the impact on home values should be conducted prior to any new factories.

As elected representatives, we must ensure that we listen to our constituents before moving forward with any significant development projects. The concerns that have been raised about the planned asphalt plant are especially crucial given its proximity to our community park and school. The potential impact on the environment and the health of our community must be thoroughly studied and evaluated before any decisions are made.

I urge the Board of Trustees and the Planning Commission to take these concerns seriously and consider the impact that this plant could have on our community. If necessary, a different location further from town should be considered. We must prioritize the health and well-being of our constituents and ensure that any decisions we make align with the best interests of our community.

Thank you for your attention to this matter. I look forward to working with you to ensure that Wellington remains a safe and healthy place to live.

Sincerely,
State Senator Janice Marchman

Janice Marchman

Written Public Comments
3:00pm 5/30/2023

Opposed - Connell Resources Asphalt Plant, Wellington CO

Sarah McPhaul <smcwhirt@live.com>

Mon 5/1/2023 1:30 PM

To: Cody Bird <birdca@wellingtoncolorado.gov>
Cc: janice.marchman.senate@coleg.gov <janice.marchman.senate@coleg.gov>;jkefalas@larimer.org <jkefalas@larimer.org>

Good afternoon,

This email is in reference to the Asphalt Plant in Wellington, CO. Without an enviromental study conducted or knowledge on how this may affect real estate costs, I'm opposed to the relocation of the Asphalt Plant to just North of Wellington Community Park. The close proximity to the main community park of Wellington, neighborhoods as well as schools needs to be considered for current and future residents; I believe this will make our community less disirable.

Thank you for your consideration,

Sarah McPhaul
Resident of Wellington
8460 W 2nd St.
Wellington, CO 80549

JANICE MARCHMAN
SENATE DISTRICT 15
State Senator
200 E. Colfax Avenue
Denver, Colorado 80203
Capitol: (303) 866-4878

COMMITTEES
Vice Chair – Senate Committee on Education
Committee on Agriculture and Natural Resources

Town of Wellington Board of Trustees and Planning Commission Members,

I am writing to you today regarding a matter that has been brought to my attention by numerous constituents in Wellington. I have received significant outreach regarding the planned asphalt plant that is set to be built near our community park and school. Many constituents have expressed their concern that an environmental study and a study on the impact on home values should be conducted prior to any new factories.

As elected representatives, we must ensure that we listen to our constituents before moving forward with any significant development projects. The concerns that have been raised about the planned asphalt plant are especially crucial given its proximity to our community park and school. The potential impact on the environment and the health of our community must be thoroughly studied and evaluated before any decisions are made.

I urge the Board of Trustees and the Planning Commission to take these concerns seriously and consider the impact that this plant could have on our community. If necessary, a different location further from town should be considered. We must prioritize the health and well-being of our constituents and ensure that any decisions we make align with the best interests of our community.

Thank you for your attention to this matter. I look forward to working with you to ensure that Wellington remains a safe and healthy place to live.

Sincerely,
State Senator Janice Marchman

Janice Marchman

Written Public Comments
3:00pm 5/30/2023

Connell Resources Asphalt Plant

John Shipp <johnshipp@gmail.com>

Mon 5/1/2023 12:47 PM

To: Cody Bird <birdca@wellingtoncolorado.gov>;janice.marchman.senate@coleg.gov <janice.marchman.senate@coleg.gov>;JKefalas@larimer.org <JKefalas@larimer.org>

Attn. Colorado Senator Janice Marchman, Larimer County Commissioner John Kefalas, Planning Director Cody Bird:

Please do not approve having the Connell Resources Asphalt Plant in Wellington, Colorado. Many toxic chemicals will be produced and this should be far away from residences. Instead, perhaps the commission should look into having the plant nearer to the county dump on the east side of Highway 25 near the Wyoming State line where there are far fewer residences. Thank you for your time and please consider what would be best for the residences of Wellington.

Sincerely,

John and Camille Shipp
6977 Sage Meadows Drive
Wellington, CO 80549

Written Public Comments
3:00pm 5/30/2023

Opposition To Proposed Hot Asphalt Plant

James Raymond <jeraymond2@gmail.com>

Tue 5/2/2023 1:14 PM

To: Cody Bird <birdca@wellingtoncolorado.gov>;Patti Garcia <garciapa@wellingtoncolorado.gov>

Cody Bird

Planning Director Town Of Wellington

Mr. Bird

I'm writing you to express my disapproval of the possible Connell asphalt plant approval to move and set up operations in the Town Of Wellington I have attended all public meeting in regards to the matter and I do not think it is a good fit for the town, as you have wittiness the majority of the town residents have showed disapproval of Connell`s move to Wellington.

I have lived in Buffalo Creek for the past 10 years and I would challenge the vision and the growth management of the town since I became a resident in January of 2013.

The Town Of Wellington has proven to me that they are not capable of making the right decision and understanding how their decisions will effect this town in the long term below are examples of past poor management decisions in my opinion.

Building a new Municipal Building on Third Street Parking for both Staff and visitors have impacted the local neighborhood and the park that is across from this municipal building. Yes the town had outgrown their old building but was this location the right choice?

The town continues approving housing developments with the growth of the new developments come traffic we struggle with the only exit into Wellington HWY 1 off of I25 this has become a bottleneck during peak hours both during the morning and evening commutes and during weekends

The town has created with the approval of the New Housing Developments huge strain on the Wellington "Potable Water Systems" How many homes were approved and built after the June 27th 2017 approval of "Resolution No.16-2017 Voluntary Watering Restrictions" they were approved and became effective immediately upon passage and sign by both Mayor Tim Singewald and Town Clerk Ed Cannon.

Even though these newer developments were lucky to have "Non-Potable Water" for outdoor irrigation and let's not forget the New Poudre School, I do believe they requested a 3" water tap for "Potable water?

The inside water consumption is still Potable Water which comes from the Towns Water Treatment Plant if the town knew back in June of 2017 that there was concerns of maximum throughput of the plant and went far enough to pass Resolution No16-2017 why did the approval of building permits continue and what strain did this put on an already strained Water Treatment Plant?

Local residents who do not have the luxury of a non-potable water supply are feeling the effects of these poor decisions today, some homeowners take pride in their yards and even having a small backyard gardens with high water rates and once again mandatory water restrictions these basic Homeowner privileges are being denied to them and I would bet this restriction and high rates will continue for years to come.

The Town approved (Annex might be a better word) the New Poudre School without doing anything with the traffic concerns for both the students who walk to school and the increase of vehicle traffic the school had caused.

And this will lead up to Connell Asphalt plant Connell they expect up to 150-200 trips a day during their peak season these are Class 8 truck trailers that will be making the majority of the trips, this along with the New County landfill will once again cause traffic backups on Owl Canyon exit this exit is north of town and I`m sure none of the town Employee use this route during their daily commutes but I will ensure you the volume of traffic will surprise you as this is a major truck route to Laramie WY and now include trash trucks and Connells vehicles it will get even worse, let's not forget about the age of the bridge and that in time CDOT will someday replace it where will this traffic be rerouted?

Written Public Comments
3:00pm 5/30/2023

Sure they will use Cr6 to Cr 66 and even widen Cr66 and work with the railroad on the crossing. Let's not forget First street as they will pave it! All of this adds increased traffic to a small town that currently struggles with traffic congestion.

Not all town`s want to grow and I believe the majority residents want that of Wellington Not to grow

Growth is vital to a vibrant community but it has to be managed and managed correctly.

This is why I oppose the Connell Asphalt plan being approved. Wellington needs to fix their existing problems before they create a new one.

I would like my letter to be part of the public record on this matter

Regards,

James Raymond

To the Town of Wellington Colorado

Wellington has been my home for over sixteen years.

The site for this Asphalt Plant is next to Wellington Community Park. Has the planning commission taken into account the well being of our children who play in our park? Or the families who come together to enjoy the park. The games that are played in the park and even dog owners who bring their dogs to play and run in the park.

The idea I may have to move for health reasons, or the devaluation of my home. And the loss of property tax to the city, I would think would be a worry to Wellington.

Fox News this evening showed where the EPA just downgraded Colorado Air Quality for the Front Range. Something to think about!

Have you the Town of Wellington Planning Commission put into plan a contingency procedure, Incase there is an accident at the Asphalt Plant, that involves lethal gases, or chemicals that could become airborne and be harmful to our community

https://www.denver7.com/news/local-news/proposal-to-move-asphalt-plant-from-timnath-to-wellington-met-with-resistance

Respectfully
X, Trustees

Written Public Comments
3:00pm 5/30/2023

Re: Stopping Asphalt Plant

M.E. Cahill <doc_critter@yahoo.com>
Wed 5/3/2023 10:40 AM
To: Cody Bird <birdca@wellingtoncolorado.gov>

Thank you for your response but I would actually like to withdraw my opposition. Speaking with the LCHD and air quality control. I found that they had only one violation and it was corrected. That the community of Tinmath have not complained of bad smells or hazards to their well being since opening. I officially withdraw my opposition that I may have been hasty in writing.

Sincerely,
Mary E. Cahill
Wellington Resident

Thank you

Sent from Yahoo Mail on Android

On Mon, May 1, 2023 at 5:29 PM, Cody Bird <birdca@wellingtoncolorado.gov> wrote:

> Thank you for the message. Your communication is saved and will be provided to the Planning Commission.
>
> The agenda item you are commenting on was scheduled for the May 1, 2023 Planning Commission meeting. You can view the May 1, 2023 Planning Commission packet at this link https://www.wellingtoncolorado.gov/Archive.aspx?AMID=56.
>
> The applicant has requested a continuance for the site development plan consideration for more time to complete the studies and reports for topics identified at the March 6, 2023 meeting. If the Planning Commission votes to table the agenda item to a later date, there will be additional opportunities to provide written and verbal comments.
>
> Thank you.
>
> TOWN OF WELLINGTON
> **Cody Bird, AICP**
> Planning Director
> Town of Wellington
> (970) 568-3554
> birdca@wellingtoncolorado.gov
> wellingtoncolorado.gov
>
> ---
>
> **From:** M.E. Cahill <doc_critter@yahoo.com>
> **Sent:** Monday, May 1, 2023 11:20 AM

Written Public Comments
3:00pm 5/30/2023

To: Cody Bird <birdca@wellingtoncolorado.gov>
Subject: Stopping Asphalt Plant

To Whom It May Concern;

I am in opposition of the Asphalt Plant being moved here. It is one thing to get inundated with country smells of cows when the wind blows right but quite another with the industrial chemical smells of this type of Plant. I suffer from lung disease and it is the last thing I want to deal with is the health issues to our air quality. I request that we take into consideration the impact would have on our citizens and the air quality we appreciate living here.

Mary

Mary E. Cahill
Resident of Wellington, CO

Sent from Yahoo Mail on Android

Lily Perry
3289 Firewater Lane
Wellington, Colorado 80549

May 8, 2023

The Town of Wellington
P.O. Box 127
Wellington, Colorado 80549

Good morning,

I am a thirteen year old girl who lives on Firewater Lane in Buffalo Creek, very close to where the future Asphalt plant may be built. I have some concerns for the health and environmental safety of this subdivision. According to a few websites I found, Asphalt plants can be very harmful to the environment, including all the people. I am aware of the toxic fumes Asphalt plants produce, and I think it to be very concerning, especially so close to so many homes.

If you look on the website: co.wright.mn.us you can find many troubling liabilities regarding the Asphalt plants around Colorado, and many other places. I hope you will find the time to read through these informational pages.

If there is one thing I think to be the most troubling, and I quote from the previously listed website, "While a state study indicates the air quality in a neighborhood next to a controversial paving plant meets safety standards, neighbors say their problems with the plant are as much about quality of life as quality of air. The odor of asphalt coming from the R.C. & Sons paving plant has been a prime complaint of several residents of the nearby Grandview neighborhood."

"Dr. Mitchell said that tiny particles in asphalt production plant emissions can cause lung damage, exacerbate breathing conditions and ultimately cause more severe problems." New York Times article.

These are problems that are not to be ignored. I hope I have given you a good reason to rethink the Asphalt plant. I don't believe it will help the residents here in Buffalo Creek, when they have the great possibility to lose more than they gain. Skin disease, cancer, trouble with breathing. Is it worth the risk of people's lives?

Sincerely,

Lily Perry

Written Public Comments
3:00pm 5/30/2023

Letter to Planning Board

Lisa Clay <lclay@advancetank.com>

Tue 5/23/2023 10:01 AM

To: Cody Bird <birdca@wellingtoncolorado.gov>

1 attachments (48 KB)

Planning Board letter 5-22-23.docx;

Good Morning Cody,

I am sorry to have to write this letter but feel that the tenor of the comments I have heard at both Planning Board, Board of Trustees and online needs the truth to be told.

Please call with any questions. Thank you for your time-

Lisa

Lisa K. Clay
CEO
Advance Tank and Construction
970-568-3444
DD: 970-237-6438
http://www.advancetank.com

-

ADVANCE TANK AND CONSTRUCTION

To: Wellington Town Planning Board

From: Lisa K. Clay
CEO

Re: Connell Batch Plant

Date: May 23, 2023

The Town has for review the lay-out of the Connell Batch Plant on land located off County Road 66. Advance Tank bought this land in 2001 after having bought the land between our present grounds and the County Road 66 property in late 1999. Advance Tank (ATC) then owned all land between County Road 64 and County Road 66 with the railroad to the East and much of Boxelder to the West. ATC did this because we wanted to make sure that we had room to grow as well as allow for a buffer between ourselves and any future growth. We worked with the Town to have this land zoned Industrial. The Town was happy to have industrial land in this logical location because it was bordered by the railroad tracks on one side and agricultural land on the West.

A few years later, the Buffalo Creek Subdivision was started. It was put in between a working dairy and the industrial land that ATC owned. As houses started to sell in the area, no concerns were raised even though ATC's property was zoned light industrial and industrial. If someone buying in Buffalo Creek had taken the time to review the zoning and what was allowed, an asphalt batch plant was listed as an appropriate use on the industrially zoned property. It still is.

Much of the land was initially sold in the light industrial area which is east of Buffalo Creek. There is 35+ acres remaining that went under contract with Connell Resources for a batch plant in January 2022. In March of 2022, Wellington adopted new land use codes, but did not change the zoning for the property. It changed the set back rules to 1000 feet from 500 feet, which is why Connell went to the board of adjustments for a variance. That variance was approved as well as the variance on the height of the silos.

With the zoning specifically stating that an asphalt batch plant is an allowable use, both Connell and ATC felt that this was a good use of the remaining 35+ acres. Connell started the design of the plant on the property that was under contract. Connell has agreed to do the following improvements to the property:

1) Sinclair Oil Company owns a high-pressure gas line that runs Northwest to Southeast on the property. Connell will put a road over most of the high-pressure gas line to protect it from getting punctured as well as to help with dust mitigation.
2) The Sanitary Sewer that stops at the north end of Pieper's Industrial Park will be brought all the way up to County Road 66.

3) Relocate the existing Wellington 18" water main that runs through the property directly west of the Sinclair gas line. This will be relocated to the west side of the property with a new easement granted to remove Wellington's existing waterline easement from conflicting with Sinclair's gas line easement. They currently have overlapping easements and the existing water main is too close to the gas line to be considered within code. Connell will provide the labor and equipment at no cost to assist the Town with alleviating this current conflict.
4) Paving CR 66 from west of the property line to Larimer County Road 7, this includes paving widths to accommodate bike lanes.
5) Paving all the onsite haul roads to limit dust.
6) Building and paving a northbound right turn lane from CR7 to eastbound Owl Canyon Road.
7) Relocate the existing non-designated emergency access road that runs through the middle of the property to the west side of the property and allow use by the Town, PFA, & North Poudre Irrigation. There is no current recorded easement or designation for this road on the property, just a 30' waterline easement, which has been turned into an access road.
8) Regrading, repaving, and installing new storm culverts at the BNSF railroad crossing. This is in partnership with BNSF and Larimer County to make a safer at grade railroad crossing on CR66.

All of this comes at an expense to Connell, much of which saves the Town from paying for these issues somewhere down the road, especially the relocation of the water line away from the high-pressure gas line, granting road access and paving roads.

Connell worked diligently with the Wellington Planning Department and said it would accommodate its requests many of which are above, but also putting 15' landscaped berms around the property to be a visual buffer. This berm will include many trees which will help mitigate some of the concerns I heard from the planning board, the board of trustees and some residents. One trustee said it would be ugly and he did not want this in his town. If you do not see it through the trees, what can be ugly, the trees? The trees also mitigate sound, air quality issues and fumes.

However, the biggest item that mitigates all the concerns raised by residents is operating the plant properly per state and county regulations and testing. Connell has agreed to all testing asked for by the county and even postponed coming to this group to get the Air Dispersion study done. Connell has not failed any of these inspections. To combat local lore, most family-owned businesses do not like to hurt their employees or their community. As a fellow business owner, the last thing I want is someone hurt.

Connell spent time talking with all neighbors that border the property or have easements on or under the property. All gave them the welcome sign. Those closest to the property feel good about what is going next to their property. They are not concerned about property values plummeting and all the other heinous things mentioned about this use. Connell offered to talk with Buffalo Creek but was turned down which is inconsistent with their actions. If you really want to learn about the batch plant, speak to those who know it and how it is run. Learn the facts directly, and not what you find on the internet. And on that note, remember that Buffalo Creek planted itself due east of a working dairy. The dairy fumes can be strong some days. Did anyone look to see what was in those fumes before buying their home? Did they worry about property values? Did they check to see how the vacant land to the east was zoned?

As I said at the March 6th Planning Committee meeting, Connell is a Northern Colorado Company with its employees living in many northern Colorado communities. It spends its money in these communities not only for business, but also as a good corporate citizen donating to non-profits. Its employees also

spend the money they earn in the communities in which they live, including Wellington. With the Town's revenue significantly below budget, a company like Connell can help boost some of those short falls and bring needed business and infrastructure to the community.

As one of the older and larger businesses in the community, ATC has been a good corporate citizen to this community. We have no desire to get into a fight with Wellington. Based on zoning, and the use by right listed within the Industrial zoning, we contracted with Connell for the sale of 35+ acres of property. Should this sale fall through due to the actions of those representing the Town of Wellington, those actions will devalue our land. This will cause us to seek legal action because we are left no other choice.

Should you have any questions, you may reach me at 970-568-3444. Mr. Bird has my email address if that would be easier.

Sincerely,

Lisa K. Clay

Written Public Comments
3:00pm 5/30/2023

Asphalt Plant Opposition

N. M. <NisthinaMcWhirt@live.com>

Thu 5/25/2023 5:26 PM

To: Cody Bird <birdca@wellingtoncolorado.gov>

Good afternoon,

We would like to voice opposition for the asphalt plant being considered for placement in Wellington.

Thank you for your time,
Shawn and Nisthina Monzingo

Print

Planning Commission June 5, 2023 Public Comment - Submission #3171

Date Submitted: 5/26/2023

Timeline

Please use the form below to submit public comment for the June 5, 2023, Planning Commission meeting.

Comments received before 3 p.m. Tuesday, May 30, 2023, will be included in the meeting agenda packet available prior to the meeting. Click here to access meeting agendas and minutes.

Written comments received after 3 p.m. Tuesday, May 30, 2023, will be published in an amended packet. All written comments must be received by 3 p.m. Friday, June 2, 2023.

Public comment may be given in person at the meeting on June 5.

First and Last Name*

James Raymond

Email Address*

jeraymond2@gmail.com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

3209 Iron Horse Way Wellington Co 80549

Public Comment for the Planning Commission June 5, 2023 Meeting

Cody Bird Planning Director Town Of Wellington Mr. Bird Iâ€™m writing you to express my disapproval of the possible Connell asphalt plant approval to move and set up operations in the Town Of Wellington I have attended all public meeting in regards to the matter and I do not think it is a good fit for the town, as you have wittiness the majority of the town residents have showed disapproval of Connell`s move to Wellington. I have lived in Buffalo Creek for the past 10 years and I would challenge the vision and the growth management of the town since I became a resident in January of 2013. The Town Of Wellington has proven to me that they are not capable of making the right decision and understanding how their decisions will effect this town in the long term below are examples of past poor management decisions in my opinion. Building a new Municipal Building on Third Street Parking for both Staff and visitors have impacted the local neighborhood and the park that is across from this municipal building. Yes the town had outgrown their old building but was this location the right choice? The town continues approving housing developments with the growth of the new developments come with traffic we struggle with the only exit into Wellington HWY 1 off of I25 this has become a bottleneck during peak hours both during the morning and evening commutes and during weekends The current age of the bridge has shown visible wear and concern of the integrity of the structure how is the Town going to manage traffic once CDOT decides it is time to replace this structure send the traffic down to Owl Canyon this will only increase the traffic on Owl Canyon (Letâ€™s not forget the landfill Traffic and the traffic to Laramie) The town has created with the approval of the New Housing Developments huge strain on the Wellington â€œPotable Water Systemsâ€ How many homes were approved and built after the June 27th 2017 approval of â€œResolution No.16-2017 Voluntary Watering Restrictionsâ€ they were approved and became effective immediately upon passage and sign by both Mayor Tim Singewald and Town Clerk Ed Cannon. Even though these newer developments were lucky to have â€œNon-Potable Waterâ€ for outdoor irrigation and letâ€™s not forget the New Poudre School, I do believe they requested a 3â€ water tap for â€œPotable water? The inside water consumption is still Potable Water which comes from the Towns Water Treatment Plant if the town knew back in June of 2017 that there was concerns of maximum throughput of the plant and went far enough to pass Resolution No16-2017 why did the approval of building permits continue and what strain did this put on an already strained Water Treatment Plant? Local residents who do not have the luxury of a non-potable water supply are feeling the effects of these poor decisions today, some homeowners take pride in their yards and even having a small backyard gardens with high water rates and once again mandatory water restrictions these basic Homeowner privileges are being denied to them and I would bet this restriction and high rates will continue for years to come. The Town approved (Annex might be a better word) the New Poudre School without doing anything with the traffic concerns for both the students who walk to school and the increase of vehicle traffic the school had caused. And this will lead up to Connell Asphalt plant Connell they expect up to 150-200 trips a day during their peak season these are Class 8 truck trailers that will be making the majority of the trips, this along with the New County landfill will once again cause traffic backups on Owl Canyon exit this exit is north of town and I`m sure none of the town Employee use this route during their daily commutes but I will ensure you the volume of traffic will surprise you as this is a major truck route to Laramie WY and now include trash trucks and Connells vehicles it will get even worse, letâ€™s not forget about the age of the bridge and that in time CDOT will someday replace it where will this traffic be rerouted? Sure they will use Cr6 to Cr 66 and even widen Cr66 and work with the railroad on the crossing. Let's not forget First Street as they will pave it! All of this adds increased traffic to a small town that currently struggles with traffic congestion. Not all town`s want to growâ€¦â€¦ and I believe the majority residents want that of Wellington, Not to grow. Growth is vital to a vibrant community but it has to be managed and managed correctly. This is why I oppose the Connell Asphalt plan being approved. Wellington needs to fix their existing problems before they create a new one. I would like my letter to be part of the public record on this matter Regards, James Raymond

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Print

Planning Commission June 5, 2023 Public Comment - Submission #3179

Date Submitted: 5/30/2023

Timeline

Please use the form below to submit public comment for the June 5, 2023, Planning Commission meeting.

Comments received before 3 p.m. Tuesday, May 30, 2023, will be included in the meeting agenda packet available prior to the meeting. Click here to access meeting agendas and minutes.

Written comments received after 3 p.m. Tuesday, May 30, 2023, will be published in an amended packet. All written comments must be received by 3 p.m. Friday, June 2, 2023.

Public comment may be given in person at the meeting on June 5.

First and Last Name*

Brittany Cowan

Email Address*

family.cowan@outlook.com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

Public Comment for the Planning Commission June 5, 2023 Meeting

Dear Planning Commission, I would like to first thank you for your time in reading these comments and truly listening to what myself, as well as MANY other residents have expressed about the proposed asphalt plant by Connell Resources. I have many concerns about this, but mostly I have concerns about the safety and well being of our community. This plant is NOT acceptable in our community as it directly violates the Land Use Code adopted by the town. While Connell Resources has stated that their emissions are safe, it has been shown that they have been in violation of the Air Pollution and Control Division for many months at a time. "John Warren, president of Connell Resources, said modern technologiesâ€" put into use more recently than some older studies on emissionsâ€" render the emissions from his plant safe. Or, at least, no less safe than car exhaust. â€œ99.9% of our emissions come from the heating associated with drying the aggregates, and in our case, we use natural gas,â€ Warren said. â€œI mean, it's automobile exhaustâ€"it has the same characteristics as those properties.'" Connell Resources was immediately failed on inspection because their NOx was significantly above the acceptable limit of 8.5 tons per year. The test wasn't even completed to test other aspects because it was an automatic fail. Connell Resources was above 15.59 tons per year, almost DOUBLE the limit.
https://npr.brightspotcdn.com/c4/c3/904609054da8a7623fc82e5c065a/apcd-stack-test-memo-redacted.pdf NOx is "NOx is the collective term for the nitrogen oxides NO and NO2, which are significant components of harmful air pollution."
https://www.noxfondet.no/en/articles/what-is-nox/ Per the article, "NOx is formed in combustion processes such as engines, power plants, and boilers, as well as industrial processes with very high temperatures (e.g., in smelters). NOx emissions in Norway mainly come from transportation (especially road transport and shipping), oil and gas activities, and land-based industry. Harmful Effects NOx contributes to respiratory diseases, the formation of ground-level ozone, and acid rain. The direct harmful effects of NOx are associated with impaired lung function and worsening of asthma, as well as respiratory diseases (e.g., COPD) and cardiovascular disease. Ground-level ozone is harmful to both humans and vegetation. Acid rain is harmful to ecosystems and vegetation and can lead to, among other things, fish mortality. In addition to environmental and health damage, NOx also contributes to damage to materials and buildings through acid rain and ground-level ozone. NOx emissions are particularly a local/regional problem, but NOx can also be transported over longer distances with air currents. In the upper atmosphere, NOx is involved in various processes that are important for the greenhouse gas budget, with both cooling and warming effects. NOx is a significant component of visible pollution (smog) that can be seen over large cities. According to the Norwegian Institute of Public Health, over 4 million deaths globally in 2019 were caused by complex pollution from particulate matter, nitrogen dioxide, and ozone." This not only shows that Connell is harmful, but also renders any air quality studies they may produce showing that their plant is "fine" is inaccurate as they clearly do not follow guidelines set out. Not only this, but I found it quite disturbing that Connell was able to get the last meeting in May postponed to June. This is the industry they work in. Air studies would have been readily available. But more importantly, those people who were on the schedule for the June 5 meeting were BUMPED because Connell couldn't do what they said they would do. How rude to those people who already had that date planned. There are so many things wrong with how this is playing out. I hope you can see that the 2,640' setback MUST be applied and the plant not built here. Please keep our town safe, rather than look for economic gains.

Optional File Attachment

Information reguarding the proposed Asphalt Plant.pdf

Optional File Attachment

Choose File | No file selected

Optional File Attachment

Choose File | No file selected

Dear Planning Committee,

It is with great importance and emphasis that I write to you today. I am asking you to please take into account the town of Wellington's Land Use Code and enforce the necessary setback for the planned asphalt plant in Wellington.

While I know the argument that state agencies regulate asphalt plants, it DOES NOT NEGATE the fact that this proposed asphalt plant **DOES** in fact curate toxic chemicals and violate the Land Use Code. As long as toxic chemicals are curated (whether regulated or not) a setback must be implied per the town of Wellington's Land Use Code. This will be discussed in more depth further down in my statement.

While the proposed site is permitted as "Right to Use", it is ONLY right to use as long as it complies with the Land Use Code that was adopted on March 22, 2022.

Below you will find significant evidence as to why this does NOT meet the current Land Use Code as well as why the Heavy Industrial and Manufacturing setback of 2,640 ft from any residential district must be applied in this case.

Per the Land Use Code:

1.01.1 Purpose. The purpose of this Land Use Code is to create a vital, cohesive, well-designed community in order to enhance the Town's small-town character and further the residents' goals as identified in the Comprehensive Plan. These zoning regulations are designed to:

A. Promote the health, safety, values, and general welfare of Town residents.

The first point made in the Land Use Code is to "promote the health, safety… and general welfare of Town residents." Allowing an asphalt plant to be built less than 1,000 feet from the nearest home and proposed homes in the Sundance development goes against the Land Use Code.

"Asphalt plants mix gravel and sand with crude oil derivatives to make the asphalt used to pave roads, highways, and parking lots across the U.S. These plants release millions of pounds of chemicals to the air during production each year, including many cancer-causing toxic air pollutants such as arsenic, benzene, formaldehyde, and cadmium. Other toxic chemicals are released into the air as the asphalt is loaded into trucks and hauled from the plant site, including volatile organic compounds, polycyclic aromatic hydrocarbons (PAHs), and very fine condensed particulates.[EPA]"

Two other points of the Land Use Code are:

B. Establish a variety of zoning district classifications according to the use of land and buildings with varying intensities of uses and standards whose interrelationships of boundary zones form a compatible pattern of land uses and buffer areas which enhance the value of each zone.

F. Promote good design and arrangement of buildings or clusters of buildings and uses in residential, business, and industrial development.

By allowing this asphalt plant to be built so close to residential homes, it will negatively impact the home values near the proposed site.

"Health Impacts & Loss of Property Value. The Blue Ridge Environmental Defense League (BREDL), a regional environmental organization, has done two studies on the adverse impacts on property values and health for residents living near asphalt plants. A property value study documented losses of up to 56% because of the presence of a nearby asphalt plant. In another study, nearly half of the residents reported negative impacts on their health from a new asphalt plant. The door-to-door health survey found 45% of residents living within a half mile of the plant reported a deterioration of their health, which began after the plant opened. The most frequent health problems cited were high blood pressure (18% of people surveyed), sinus problems (18%), headaches (14%), and shortness of breath (9%). [BREDL]."

Noise pollution is also a concern from the plant. According to David Wang, "Noise generated by loader loading, induced draft fan operation, drying cylinder rotation, aggregate hoist lifting, and vibrating screen screening," is a source of noise pollution. This goes against the Land Use Code as well:

K. Establish regulations that promotes adequate light and air, maintains acceptable noise levels, and conserves energy and natural resources.

Another major concern is this plant's location within the Boxelder Watershed.

"Asphalt plants have the potential to contaminate ground water and surface waters through spills and leaks of chemicals. Contaminated groundwater can migrate towards nearby streams and lakes. Possible sources of groundwater pollution are: • Fuel tanks, pipework and fueling stations, • Solvents, • Other chemical agents used and stored onsite. Asphalt plants should not be sited in flood plains."

According to the Land Use Code, industrial areas should be located interior to the large block of industrial/light industrial. The proposed asphalt plant DOES NOT follow this.

"3.04.2 I – Industrial District. A. Intent. The Industrial District is intended to provide a location for large-format buildings for manufacturing, warehousing and distributing, indoor and outdoor storage. Locations for this zone require good access to major arterial streets and adequate water, sewer and power. Industrial areas should generally be located interior to the large block of industrial/light industrial areas."

Also, per the Land Use Code:

C. Limitations. Any use in this District shall conform to the following requirements:

1. Dust, fumes, odors, smoke, vapor and noise shall be confined to the site and be controlled in accordance with the state air pollution laws.

While the proposed plant may be regulated by state agencies, they cannot guarantee that these toxins will be confined to the site. In fact, pollution has been known to be carried over two and a half miles from asphalt sites.

Per the proof listed below on articles published by the EPA, US Department of Health and Human Services, scientists and others, the proposed asphalt plant in our town MUST be labeled as heavy industrial and the 2,640 feet setback from any residential district must be imposed:

B. Any Industrial and Manufacturing, Heavy use producing and curating toxic chemicals or conducting animal slaughtering shall be located at least:

1. Two thousand six hundred forty (2,640) feet from any residential district, religious land use, medical care facility, or school.

"Asphalt Fumes are Known Toxins. The federal Environmental Protection Agency (EPA) states "Asphalt processing and asphalt roofing manufacturing facilities are major sources of hazardous air pollutants such as formaldehyde, hexane, phenol, polycyclic organic matter, and toluene. Exposure to these air toxins may cause cancer, central nervous system problems, liver damage, respiratory problems and skin irritation." [EPA]. According to one health agency, asphalt fumes contain substances known to cause cancer, can cause coughing, wheezing or shortness of breath, severe irritation of the skin, headaches, dizziness, and nausea. [NJDHSS] Animal studies show PAHs affect reproduction, cause birth defects and are harmful to the immune system. [NJDHSS] The US Department of Health and Human Services has determined that PAHs may be carcinogenic to humans. [DHHS]."

I appreciate your time to correct this error in planning and ensure that the proposed asphalt site is enforced CORRECTLY. Again, while I know the argument that state agencies regulate asphalt plants, it DOES NOT NEGATE the fact that this proposed asphalt plant **DOES** in fact curate toxic chemicals and violate the Land Use Code. As long as toxic chemicals are curated (whether regulated or not) a setback must be implied per the town of Wellington's Land Use Code.

Please see the additional evidence below which outlines the toxic chemicals curated from asphalt plants as well as other concerning issues.

Sincerely,

Jade and Brittany Cowan and family

Additional Information:

About Asphalt Plant Pollution

Asphalt plants mix gravel and sand with crude oil derivatives to make the asphalt used to pave roads, highways, and parking lots across the country. These plants release millions of pounds of chemicals to the air during production each year, including many cancer-causing toxic air pollutants such as arsenic, benzene, formaldehyde, and cadmium. Other toxic chemicals are released into the air as the asphalt is loaded into trucks and hauled from the plant site, including volatile organic compounds, polycyclic aromatic hydrocarbons (PAHs), and very fine condensed particulates.[EPA]

Asphalt Fumes are Known Toxins. The federal Environmental Protection Agency (EPA) states "Asphalt processing and asphalt roofing manufacturing facilities are major sources of hazardous air pollutants such as formaldehyde, hexane, phenol, polycyclic organic matter, and toluene. Exposure to these air toxics may cause cancer, central nervous system problems, liver damage, respiratory problems and skin irritation." [EPA]. According to one health agency, asphalt fumes contain substances known to cause cancer, can cause coughing, wheezing or shortness of breath, severe irritation of the skin, headaches, dizziness, and nausea. [NJDHSS] Animal studies show PAHs affect reproduction, cause birth defects and are harmful to the immune system. [NJDHSS] The US Department of Health and Human Services has determined that PAHs may be carcinogenic to humans. [DHHS]

Flawed Tests Underestimate Health Risks. In addition to smokestack emissions, large amounts of harmful "fugitive emissions" are released as the asphalt is moved around in trucks and conveyor belts, and is stored in stockpiles. A small asphalt plant producing 100 thousand tons of asphalt a year may release up to 50 tons of toxic fugitive emissions into the air. [Dr. R. Nadkarni] Stagnant air and local weather patterns often increase the level of exposure to local communities. In fact, most asphalt plants are not even tested for toxic emissions. The amounts of these pollutants that are released from a facility are estimated by computers and mathematical formulas rather than by actual stack testing, estimates that experts agree do not accurately predict the amount of toxic fugitive emissions released and the risks they pose. According to Dr. Luanne Williams, a North Carolina state toxicologist, 40% of the toxins from asphalt plant smokestacks even meet air quality standards and for the other 60% of these emissions, the state lacks sufficient data to determine safe levels.

There is documented evidence from health experts and federal and state regulators of the serious health effects of asphalt plant emissions. We must heed these early warning signs and take action to prevent communities from further exposure to cancer-causing substances released by asphalt plants. The following actions are needed:

Moratoriums on asphalt plant construction and operation in communities where people live and go to school;
Stricter testing and enforcement of air quality standards at asphalt plants; and
Improved air standards that address all toxic contaminants including fugitive emissions.

Even if an asphalt plant meets all air pollution standards, people living nearby are still exposed to cancer-causing substances that can cause long-term damage. These standards are based on the principle of "acceptable risk", and assume each state will enforce the standards, the plants will operate perfectly, and the owners can be trusted to operate on an honor system where they are expected to follow all the laws and regulations that apply to their facility without any government oversight. In the majority of cases, it is unknown whether the `theoretical' air emissions predicted by computer models and used by plant owners accurately reflect air emissions from a plant's daily operations. We must put safety first and shut down or overhaul the current system that fails to protect communities from the daily health hazards of asphalt plant pollution.
Reference:
https://cms2.revize.com/revize/cityofcovington/covington/docs/downtownplan/Asphalt%20Facilities%20Analysis%20for%20Downtown%20Covington%20AHBL%20Final%20Revised_06_03_2010%20Clean%20Copy.pdf

II. Impacts of Asphalt Plants Asphalt plants have the potential for a variety of impacts due to the volume and type of materials handled, the heat requirements of the manufacturing process and associated emissions from burning of fuels, and the equipment used.

While required Best Available Control Technologies and other regulatory requirements work to minimize impacts of asphalt plants, there may still be potential for impacts, particularly due to equipment failure or human error. Below is a discussion of potential environmental impacts followed by a discussion on how these impacts may affect development in Covington’s Downtown.

Air quality Asphalt plants have the potential to emit particulate matter, polycyclic aromatic hydrocarbons (PAHs), and gaseous volatile organic compounds (VOCs). These pollutants are considered detrimental to human health (some are suspected carcinogens). The degree to which emissions are hazardous also depends on the fuel used in the production process. Natural gas or propane produce the least hazardous emissions, whereas oil or diesel may create more harmful emissions.

The mixer portion of an asphalt plant is the most significant source of gaseous emissions, however fugitive emissions may be released from other sources such as bitumen tanks, skip hoists, and loading stations. The main sources of particulates include stack emissions, as well as fugitive emissions from storage piles and transport of materials.

The amount of “stack dust” emitted depends on a number of production factors, including: • The nature and the moisture content of the used mineral materials, • The treatment of the mineral materials in the drum, • The amount and temperature of the waste gas, • The waste gas velocity in the drum, • The shape of the extraction hood, • The total output of the plant.

While technology, proper emission control systems, and periodic inspection and reporting may all help to minimize pollutants, asphalt plants are allowed to emit pollutants up to a certain level

under state and federal law. These emissions could have an impact on immediate ambient air quality that can be noticeable to the general public in the vicinity of the facility.

While EPA air quality standards (incorporated in WAC 173-400) would not allow an asphalt plant that causes or contributes to a violation of ambient air quality standards to be permitted, there is always some potential for the release of harmful pollutants above allowed levels.

Where pollution control technologies fail, or human operators make errors, plumes of gases may be released. Emissions from asphalt plants and associated activities also have potential for creating odor impacts.

The main source of odor for asphalt plants is typically bitumen. "Among the compounds identified in bitumen and its emissions, some have been listed as carcinogenic by the International Agency for Research on Cancer (IARC) and/or listed as carcinogenic, mutagenic, toxic to reproduction (CMR) and/or hazardous by the European Union."

Odor may be generated from the loading of bitumen tanks, and emptying of the mixer onto conveyors, or into trucks. While controls such as vapor condensers and baghouses are effective at reducing the everyday adverse impact of odors, the potential for offsite odors still exists. Routine site inspection to ensure good housekeeping practices are being used for storage and on-site movement of materials, and equipment is operating as specified, may be among the steps taken to minimize air quality impacts.

Siting asphalt plants downwind from residential areas and/or tightly regulating hours of operation may help to minimize odor and impacts to ambient air quality. The predominant wind patterns in the Covington TO: Richard Hart, City of Covington 04/05/10 FROM: AHBL, Inc 4 Regulatory Options for Asphalt Batch Plants area are generally from the southwest. The majority of Covington's downtown is to the east/northeast of the proposed asphalt plant site. This means that existing and new development would at least partially be downwind from the proposed asphalt plant site.

D. Water quality Asphalt plants have the potential to contaminate ground water and surface waters through spills and leaks of chemicals. Contaminated groundwater can migrate towards nearby streams and lakes. Possible sources of groundwater pollution are: • Fuel tanks, pipework and fueling stations, • Solvents, • Other chemical agents used and stored onsite. Asphalt plants should not be sited in flood plains.1 In addition to good housekeeping and best management practices to minimize spills and leaks associated with the manufacturing and delivery process, facilities often channel stormwater to avoid contamination or remove

"An asphalt plant is regarded everywhere as a quintessential heavy industrial use. It is associated with noise, with smells, with dust, with heavy truck traffic."

The pollution asphalt plants have

David Wang

David Wang

Overseas Manager at Santai Machinery CO.,LTD
Published Oct 10, 2018

What pollution do asphalt plants have in production?

1 Pollutants

The pollutants generated during the operation of the asphalt mixing plant mainly include the following aspects, as shown in chart 1.

(1) Harmful gases. The flue gas generated by the drum burner, the asphalt discharge produced by the finished product discharge port, the asphalt tank, the heavy oil tank heating and insulation, and the SOx, NOx, CO, CO2 discharged from the chimney.

(2) Dust. The loading process and the mixing of soot and dust generated in the main building and the gathering site.

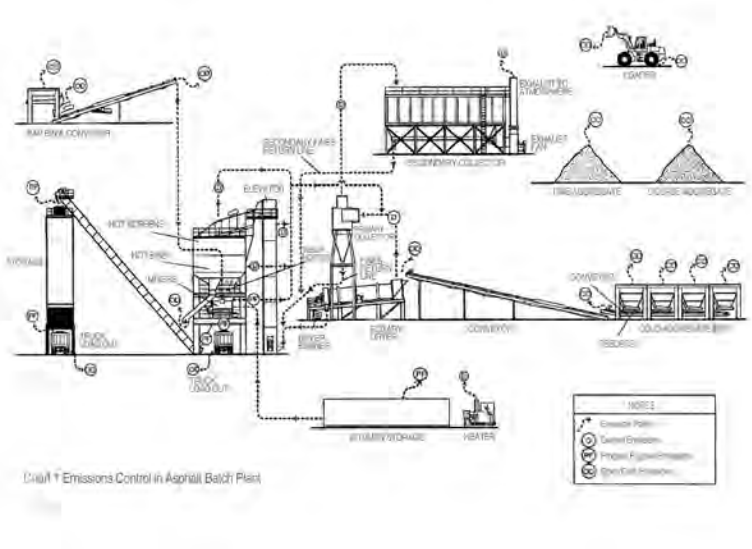
(3) smell. The odor generated by the storage, unloading, and heating of the asphalt, as well as the odor of the burner during operation and the odor generated by the asphalt mixture on the truck.

(4) Noise. Noise generated by loader loading, induced draft fan operation, drying cylinder rotation, aggregate hoist lifting, and vibrating screen screening.

(5) Waste water and waste liquid. Waste water and waste liquid are mainly derived from cold aggregate storage (infiltration or mixing with natural soil), fuel oil tanks, heat transfer oil, oil and gas storage tanks, pipelines and gas stations, solvents, additives, etc.

(6) Waste. The waste is derived from the secondary recovery powder of the bag filter, laboratory analysis solvent, and the like.

(7) Visual aspects. Mainly the visual impact of the main building or chimney of the mixing station, and also the color of the paint in the mixing station; the other includes the steam in the wet aggregate discharged from the chimney, the storage area of the cold material and the lighting of the factory.



Typical Emissions Control in Asphalt Batch Plant

2 Harm of pollutants

These pollutants can cause the following hazards to the environment and the human body.

(1) Asphalt smoke. Asphalt smoke contains thousands of substances, and the main harmful substances are acridine, phenols, pyridines, anthraquinones and benzopyrenes. Benzopyrene in asphaltic fumes is highly carcinogenic and toxic, causing headaches, dizziness, nausea and vomiting, pharyngitis, rhinitis, and enlarged liver.

(2) Dust. Dust mainly damages the body's respiratory system. After the inhalable particles in the air are inhaled into the human body, they enter the lungs through the nose, pharynx and bronchus. Some stimulating gas particles can be adsorbed on the nasopharynx to cause rhinitis and pharyngitis. The fine particles entering the lungs are blocked by the local tissues of the lungs. The role is easy to cause bronchitis, pulmonary fibrosis and emphysema.

(3) Sulfur dioxide. After entering the respiratory tract, sulfur dioxide is mostly soluble in water, so most of it is blocked in the upper respiratory tract, causing corrosive sulfite, sulfuric acid and sulfate on the moist mucous membrane to enhance the stimulation. The combined action of sulfur dioxide and fly ash can promote the proliferation of alveolar fibers, damage the lung tissue, and develop emphysema.

(4) Carbon monoxide. The degree of damage of carbon monoxide to the body depends mainly on the concentration and the length of time the body absorbs. Carbon monoxide poisoning can cause hypoxia in the body tissues, and the most significant impact on the heart and brain, often leading to softening and necrosis of brain tissue.

(5) Nitrogen oxides. Nitrogen oxides are less irritating to the mucous membranes of the eyes and upper respiratory tract, mainly invading the bronchioles and alveoli in the deep respiratory tract, causing pulmonary edema.

(6) Noise. Noise can not only seriously affect the auditory organs, but also cause people to lose hearing, but also affect sleep and nervous system, making people feel impatient and easy to get angry. Since noise can irritate the nervous system and cause it to be suppressed, people who work in a noisy environment for a long time are prone to neurasthenia.

(7) Odor. The odor generated by asphaltic cigarettes seriously affects the growth and development of humans, animals, and plants. If people are exposed to such odors for a long time, they may cause respiratory diseases and skin diseases, and may induce cancer.

Chart 2 Emissions Sources KG/T

Process		Particle Qty	PM10	PM2.5
Batch mix plant	Open dust emission	16	2.35	0.135
	Water filter	0.07	0.045	0.014
	Bag filter	0.021	0.014	0.004
Continuous type plant	Open dust emission	14	3.25	0.15
	Water filter	0.023	0.015	0.002
	Bag filter	0.017	0.012	0.001

Print

Planning Commission June 5, 2023 Public Comment - Submission #3176

Date Submitted: 5/30/2023

Timeline

Please use the form below to submit public comment for the June 5, 2023, Planning Commission meeting.

Comments received before 3 p.m. Tuesday, May 30, 2023, will be included in the meeting agenda packet available prior to the meeting. Click here to access meeting agendas and minutes.

Written comments received after 3 p.m. Tuesday, May 30, 2023, will be published in an amended packet. All written comments must be received by 3 p.m. Friday, June 2, 2023.

Public comment may be given in person at the meeting on June 5.

First and Last Name*

Jade Cowan

Email Address*

jade.cowan@outlook.com

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

3857 Mount Hope St

Public Comment for the Planning Commission June 5, 2023 Meeting

Dear Members of the Planning Commission, I am writing to express my strong opposition to the approval of the proposed asphalt plant application by Connell Industries in our community. I believe that the establishment of an asphalt plant in close proximity to residential areas, schools, and parks would have detrimental effects on the well-being and safety of our community members. Firstly, I would like to draw attention to the statement made by Connell Industries, indicating that they curate toxic chemicals. This admission raises serious concerns as it directly violates the land use code in place. Regardless of any mitigation measures they may propose, the fact remains that the production of toxic chemicals is inherent to their operations. Consequently, a setback of 2,640 feet should be mandatory according to the land use code regulations. Furthermore, it is important to note that Connell Industries has been in violation of regulations for several months, casting doubt on their commitment to effectively mitigate the negative impacts associated with their activities. This history of non-compliance raises serious doubts about the credibility and reliability of their claims. As a community, we cannot trust that Connell Industries will truly prioritize the health and well-being of our residents. The air quality in our town is already a cause for concern, and the addition of an asphalt plant would only exacerbate the issue. The emission of pollutants and particulate matter from such a facility would further degrade the air we breathe, posing potential health risks to the community. Additionally, the close proximity of schools, parks, and residential areas to the proposed plant site raises alarm bells, as these locations should be safeguarded to ensure the safety and well-being of our children, families, and residents. In light of the potential adverse effects on air quality, violation of land use code, and proximity to sensitive areas, I strongly urge the Planning Commission to reject the approval of the asphalt plant application submitted by Connell Industries. Our community deserves to live in a healthy and safe environment, and allowing such an operation to proceed would compromise the quality of life for all residents. I kindly request that you carefully consider the concerns raised by myself and others who share my viewpoint. Your decision has the power to shape the future of our community, and I trust that you will prioritize the well-being of the residents of Wellington above any potential economic gains. Thank you for your time and attention to this matter. I look forward to a favorable response that reflects the best interests of our community. Sincerely, Jade Cowan

Written Public Comments
3:00pm 5/30/2023

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

Print

Planning Commission June 5, 2023 Public Comment - Submission #3180

Date Submitted: 5/30/2023

Timeline

Please use the form below to submit public comment for the June 5, 2023, Planning Commission meeting.

Comments received before 3 p.m. Tuesday, May 30, 2023, will be included in the meeting agenda packet available prior to the meeting. Click here to access meeting agendas and minutes.

Written comments received after 3 p.m. Tuesday, May 30, 2023, will be published in an amended packet. All written comments must be received by 3 p.m. Friday, June 2, 2023.

Public comment may be given in person at the meeting on June 5.

First and Last Name*

Benjamin Trabing

Email Address*

trabing@ucar.edu

Are you a Town of Wellington Resident? *

- [x] Yes
- [ ] No

Address

3147 Alybar Dr. 7D, Wellington, CO, 80549

Public Comment for the Planning Commission June 5, 2023 Meeting

See attached pdf.

Optional File Attachment

Connel_Plant_Trabing.pdf

Optional File Attachment

Choose File No file selected

Optional File Attachment

Choose File No file selected

May 30, 2023

Dear Board of Trustees,

Thank you for considering comments from the community and I would like to voice my concern for the construction of the Connell Resources asphalt plant in the industrial zone northeast of the Wellington Community Park. First, I would like to mention that I am qualified to discuss the asphalt plant emissions and the impact on our community as I have a B.S. in meteorology from the University of Oklahoma and a M.S. and Ph.D. in atmospheric science from Colorado State University. As a researcher, I find it helpful to consider the number of peer-reviewed studies that have affirmed that asphalt plants emit toxic chemicals that are hazardous to people and animals. The toxic and flammable chemicals at asphalt plants are the reason why asphalt plants are classified as heavy industry and are required by many U.S. states to complete comprehensive studies of how far and in what direction emissions from the plant will travel to assess the risk to local communities. It would be a mistake to not consider the impacts that the asphalt plant would have to the health and safety of people in the residential areas around the proposed asphalt plant.

In a past meeting it was stated that the only pollution from the batch asphalt plant will be in the form of steam; however, this statement is misleading. The emissions from the plant due solely to burning natural gas will produce mainly carbon dioxide and water vapor (steam) although additional compounds such as carbon monoxide are also produced. In contrast, the purpose of burning natural gas is to heat the asphalt (also called bitumen) which does in fact emit harmful fumes. The emissions from heated asphalt are the main concern for the community because it contains several chemical compounds that are hazardous to people and animals.

When asphalt is heated, it releases an increasing amount of fumes into the atmosphere that contain health risks. These fumes include benzothiazole, polycyclic aromatic compounds (PAHs), volatile organic compounds (VOCs), Hydrogen Sulfide, and small particulate matter ($PM_{2.5}$). The amounts of these compounds will be dependent on the mixture of rock aggregates, liquid asphalt, and any solvents used by the plant. To get a sense of the health risks, a survey found that 45% of people living within 2640 ft suffered adverse health conditions within 2 years after the opening an asphalt plant in North Carolina. Strict Hydrogen Sulfide exposure limits are set for asphalt plant workers around the world; however, no such limits are set for the residential communities around asphalt plants. Hydrogen sulfide is both toxic to people and highly flammable which has been a contributing factor to explosions and fires at asphalt plants in the past. Although a well-regulated asphalt plant should have a minimal risk for fires and explosions, the possibility will never be zero which is why asphalt plants are a heavy industry and should not be near residential areas.

In addition to the immediate health risks from breathing in the hazardous chemicals emitted by asphalt plants, please consider that VOCs and other chemical compounds will also contaminate the soil in the area surrounding the plant. Another major waste product of asphalt plants is formaldehyde. Formaldehyde is a well-known carcinogen that is water soluble, meaning that it readily dissolves in water and will contaminate local groundwater. This puts the dog pond at the

community park at great risk of contamination with the concentration of cancerous chemicals continually building up over time as the asphalt plant operates.

Thank you again for considering my concern that the proximity of the proposed plant to the community park, neighboring residential communities, and Eyestone Elementary School poses a public health risk to our community. Asphalt plants are considered heavy industry because of the toxic and flammable chemicals used in daily operations. The pollutants from asphalt plants are airborne and a report from Berzeit University estimated that asphalt plant pollution can travel 1-1.5 miles from the source. My son, who attends Eyestone Elementary School and regularly plays at the community park, has asthma and will be at greater risk for respiratory distress due to the toxic air pollutants emitted by the proposed asphalt plant.

Sincerely,

Benjamin Trabing

Dr. Benjamin Trabing
(352)229-9108
trabing@ucar.edu