Challenging today.
Reinventing tomorrow.

Project Needs Assessment

Prepared By

Jacobs, Loveland, CO

Prepared For

Town of Wellington, CO

3735 Cleveland Ave, PO Box 127

Wellington, CO 80549

1. Application Information

- Entity name and address, Name and type of project

* System Facility Name: WELLINGTON, TOWN OF (David Myer) | Create New Facility

* Project: 141601W-B-Wellington, Town of 141601W-B

Facility/Property Address 1: PO Box 127

Facility/Property Address 2:

County:

City: Wellington

State: CO

Zip: 80549

Owner info

Troy Hamman
P.O. Box 127; Wellington, CO 80549
Email:hammantl@wellingtoncolorado.gov
Phone: (970) 568-3381

2. Executive Summary

The Town of Wellington provides service to areas experiencing substantial population growth which accelerates the need to expand treatment capacity. The organic loading to the facility has reached the permitted capacity. Improvements to the facility are required to meet more stringent discharge limits as well as to provide process equipment redundancy. The selected improvements for the WWTP include a new influent pump station, headworks building, step feed aeration basin, two secondary clarifiers, UV facility, two aerobic digesters, and dewatering facility. This alternative also includes process improvements to the existing secondary treatment system to meet anticipated effluent limits. The environmental and public health benefits will be higher effluent quality such as lower effluent biological oxygen demand, nitrogen, and phosphorus concentrations.

3. System Structure and Operation

Troy Hamman
P.O. Box 127; Wellington, CO 80549
Email:hammantl@wellingtoncolorado.gov
Phone: (970) 568-3381

3.2 Organizational Chart

Attachment 2

3.3 Current Operator in Responsible Charge (ORC)

Current Operator in Responsible Charge
Richard Lee Hopp
Cert. #- CWP-XA-00030-0399 (1704)
Cert. Exp. Date- 03/27/2022

3.4 Operator Certification

Yes, the facility currently staffs two operators who currently hold B licenses and are working towards achieving A certifications prior to the expansion being completed and brought on line. We also have other operators who hold entry level certifications.

3.5 20-year Cash Flow Projection

Attachment 4

4. Project Purpose and Need

4.1 Compliance

Aside from an upset in the Spring of 2019, the Town has consistently met their current permit since it took effect in April 2018. The permit includes daily and monthly maximum limits for certain parameters, such as biological oxygen demand (BOD), total suspended solids (TSS), Total Ammonia, and E Coli. The current lowest limit for total ammonia occurs in August (1.9 mg N/L 30-day average) and there is no total inorganic nitrogen (TIN) limit. The anticipated discharge permit includes a reduced effluent ammonia concentration (e.g. 1.0 mg-N/L in August) and a daily maximum TIN limit of 8.5 mg-N/L. This change in permit is a significant driver of the project needs and necessitates new processes and advanced controls.

4.2 Existing Facility Limitations

The Headworks Building houses screening and grit removal equipment. The upper level space is fairly tight for maintenance of equipment and there is not room to add additional capacity.

The current aeration basin is a three-ring Orbal Oxidation Ditch with a total volume of 1 MG and eight disc aerators. Since there is only one aeration basin, the basin has not been taken down for inspection or full cleaning since it went on-line in 2003. Debris has accumulated in the basin which cannot be easily cleaned out. The mixed liquor recirculation pump has become plugged at times with rags from the aeration basin.

There are four existing secondary clarifiers. Algae growth within the uncovered effluent launders requires weekly cleaning which raises safety concerns for staff. Overall, the clarifiers are serviceable for future use.

The existing RAS/WAS pump room has access issues due to the current layout of process piping. This has led to safety concerns for staff.

The plant has four aerobic digester tanks. Valves and actuators freeze in the winter and disparate diffusers make aeration difficult to control.

Sludge dewatering is accomplished by a belt filter press located in the Sludge Dewatering Building. The belt filter press has been very reliable, but there is only one unit so no redundancy exists. The current air drying operation reduces the volume of solids that must be hauled off site but the process is weather-dependent during all portions of the year.

The Administration/Ultraviolet (UV) Building houses the Laboratory, Control Room, restroom, and UV disinfection process. The operator interface panel has lost some functionality and the technology is aging. Although the UV system meets current disinfection limits for current peak flows, there is not room for additional capacity. UV cassettes must be removed manually which leads to slipping concerns for staff.

4.3 Operations and Maintenance issues

The following equipment requires frequent maintenance and repairs: headworks screening equipment, cleaning the clarifier launders, the existing blowers for the aerobic digesters, the UV lamps. The following equipment is currently difficult to operate: accessing the RAS/WAS pumps, controlling the aerobic digesters airflow year-round, the digesters and drying beds during winter, and the administration building / lab space / UV room are crowded.

5. Existing Facilities Analysis

Existing permitted capacity:

0.9 MGD, 2627 lb BOD/d

5.1.1 Other Discharges

Boxelder Sanitation District WWTF is the only other discharge to this stream segment, COSPCP13c.

5.1.2 Service Area

The Town's existing Wastewater Utility Service Area (WUSA) and growth management area (GMA) are defined as part of the NFRWQPA's Areawide Water Quality Management Plan and are located in Larimer County. The boundaries of the existing collection system are from south of E County Road 66 to north of E County Road 58 and east of N County Road 9 to west of N County Road 5.

The Town of Wellington currently has 4,103 residential taps. There are 69 homes which are not connected to the Wellington WWTP which leaves 4,034 total residential taps on the Town's wastewater collection system. Thus, the WWTP services approximately 10,246 residents. In addition, there are 146 commercial/industrial taps.

The 2020 average and max month (30-d running average) daily flow and load from the service area were 0.62 and 0.70 million gallons per day and 1,730 and 3,980 pounds BOD/day.

5.1.3 Facilities layout

The headworks building contains one 6-mm mechanical bar screen, one 25-mm manual bar rack, one screenings press, one vortex grit separator, one grit pump, one grit cyclone and classifier, one grit and screenings dumpster, and an automatic composite sampler. The capacity of the head works is 2.25 MGD peak hour flow.

The influent pump station contains 4 submersible pumps (3 duty + 1 standby). The firm pumping capacity is 1.73 MGD.

The 3-ring Orbal Oxidation Ditch has a total volume of 1 MG and 8 disc aerators for oxygen transfer. There is an internal recycle from the inner-most ring to the outer-most ring at 1,300 gpm. The loading capacity of the basin has been confirmed with a process model to be the same as the permitted capacity, 2,627 lb BOD/d.

The four existing secondary clarifiers are fed by a four-gate splitter box. All four clarifiers are 35' diameter. The solids loading rate capacity is 29 lb/d/ft2 under maximum month conditions.

The aerobic digesters have three blowers (2 duty and 1 standby) with a capacity of 1,900 SCFM each. The four aerobic digesters have a total volume of 0.512 MG.

The dewatering facility contains a progressing cavity transfer pump, a DynaBlend emulsion polymer feed system and a one-meter belt filter press. The hydraulic and solids loading of the belt filter press are roughly 100 gpm/m and 1500 lb/hr/m. The facility has 45,000 ft2 of sludge drying area.

The administration / UV building houses the Laboratory, Control Room, restroom, and UV disinfection process. The UV system consists of four horizontal UV lamp banks and two UV channels. The hydraulic capacity of the UV system is 2.25 MGD peak hour flow.

5.1.4 Existing PFD

Attachment 5

5.1.5 Wastewater Flows

In 2019 the daily influent flow ranged from 0.50 to 0.80 MGD. The peak hour of the past 5 years was 2.06 MGD. The 30-day rolling average influent flow ranged from 0.55 to 0.70 MGD. The 30-day rolling average of the historical raw influent wastewater flow is used to evaluate trends and to calculate the maximum month flows for a given year. In the Fall of 2019, there were many days that exceeded 80% of the permitted flow (720,000 gal/d). The residuals flow from the seasonally used groundwater nanofiltration water treatment plant was shut off during the winters of 2017/18 and 2019/20; the corresponding drop in the wastewater influent attributed to the nanofiltration Water Treatment Plant (WTP) residual flow is on the order of 0.15 MGD. Aside from the flows from the WTP, the service area is mainly residential, with little commercial or industrial flows currently.

In 2019 the annual average, maximum month, maximum week, maximum day and peak hour flows were: 0.63, 0.71, 0.73, 0.77, and 1.39 MGD. The flows are very stable and do not indicate any significant infiltration and inflow.

The influent characteristics are typical of a residential community with water-conservation efforts. These attributes can lead to stronger municipal wastewater.

5.1.6 Treatment Appropriateness

Yes, the current treatment processes are appropriate for treating the current influent flows and loads with the current discharge permit. If the influent flows and loads increase at all, which they are expected to do, the facility will begin to exceed its capacity.

5.1.7 20 Year Capacity

No, the facility does not have the capacity for the next 20 years. The Town of Wellington has experienced higher than anticipated population growth in recent years and the facility is nearly at its treatment capacity. Also, the preliminary effluent limits are more strict than the existing wastewater treatment is capable to meet.

5.1.8 Current Operation Controls

The current operational controls are appropriate for the existing discharge permit. Some processes are difficult to control due to equipment limitations, such as controlling airflow between aerobic digesters with different types of aeration diffusers. The following controls are successfully used to meet the permits: Aeration control with disc aerators and water level, flow splitting mixed liquor between four existing secondary clarifiers, chemical addition for filament control as needed, and wasting control to maintain a suitable SRT.

5.2 – Collection System

Not applicable.

6. Facility Planning Analysis

6.1.1 New Project Map

Attachment 7

6.1.2 208 Plan

Yes. The Town of Wellington's wastewater utility service area (WUSA) is within the 208 planning area of the North Front Range (NFR) Water Quality Planning Association. The Town is in the process of updating its wastewater utility plan. The update is in review with NFR currently. Once the update is complete, this project will be identified in the overall areawide 208 plan.

6.1.3 Were Local and Regional Planning Efforts Considered

Wellington's Comprehensive Plan adopted by the Town's board was considered. Findings of the recently completed master plans of the Town's collection system and WWTP were also considered into the design planning.

The Town of Wellington Comprehensive Plan was adopted by the Town's Planning Commission on August 2, 2021. The plan is a guiding document crafted through community input to provide a 20+ year vision for the Town's future. The goal of comprehensive planning is to align that vision with expected growth of the community, ensuring the community's values, resources, and infrastructure are properly planned. This planning process included a review of all facets of the community, including: managing growth; land use and development patterns; major infrastructure and facilities planning; attraction of commercial development (including development and redevelopment downtown); resource allocation (including looking at recommendations to maximize water supply); transportation; park and open space management; and regional coordination.

The Town completed a Wastewater Treatment Master Plan in December 2020. The Master Plan was produced in association with the Wastewater Collection Master Plan which was finalized in July 2021. The Wastewater Treatment Master Plan included the following:

- Review of existing flows and loads
- Summary of existing facilities
- Projection of future flows and loads
- Identification of future treatment needs
- Recommended capital improvement plan

Consolidation

Yes, consolidation with nearby facilities was considered. The nearest facility to the Wellington WWTP is 8.8 miles away and owned by Boxelder Sanitation District. The wastewater service areas of the Town of Wellington and Boxelder Sanitation District border each other at the south end of the Town's service area. The cost of laying such long collection lines through the Boxelder service area would be substantial (in the approximate range of $30 million to $40 million). In addition, the Boxelder Sanitation District just completed a significant facility expansion from 3

MGD to 4.6 MGD for the price of $32.7 million to meet its own growing need. Consolidating with Wellington would require another expansion as the Wellington flow would take up the new capacity at Boxelder. The next nearest facility is the City of Fort Collins WWTP across the Poudre River. Collection piping would have to be routed through Boxelder's service area to get to the City of Fort Collins' plant and would include a crossing under the Poudre River which would incur even higher costs. For these reasons, consolidation with other nearby entities is not recommended.

6.2 Population Growth

66,235 gpd

The Town's vision is that purposeful development decisions will result in balanced population growth over the next 20-plus years, resulting in a population of approximately 25,000 in 2040. To achieve this, master and financial planning efforts for the Town's water and wastewater collection/treatment system have been ongoing, evaluating the needed infrastructure and treatment capacity based on the growth projections provided in Attachment B. These projections were developed by the Town's planning staff to provide more purposeful development decisions that would result in a population of approximately 25,000 in 2040, consistent with the numbers used in the Town's master plans for both its collection system and wastewater treatment plant. Planning efforts are also evaluating the longer-range population needs of the community and including considerations for future plant expansions that will preserve the Town's ability to continue to grow while ensuring that capital improvements in the short term are constrained to availability of resources and reasonable funding.

Identify waste load projections for major effluent parameters such as BOD, TSS, ammonia, phosphorus, metals, etc.

The Town developed official population projections for each year for the next 20 years for planning purposes. This projection is provided in attachment 8. Historical population and influent data and calibrated collection system analysis were used to develop flow projections based on population growth. The projected BOD, TSS, Ammonia, and phosphorus loads are described in Attachment 16. The 2040 loads are projected as 5,955 lb BOD/d, 5,310 lb TSS/d, 700 lb NHx-N/d, and 165 lb TP/d.

Town is not anticipating an increase in metal loads or any additional major effluent parameters other that what is currently being sent to the plant. Commercial establishments such as restaurants and breweries may come online during the next 20 years; however, the Town is expecting to have pretreatment requirements in place prior to that. Sample ports will also be considered to monitor wastewater flows directly from individual future commercial establishments. There are currently no major industrial discharges to the system, and any future industrial dischargers would be subject to pretreatment requirements and installation of sampling ports.

7. Assessment of Alternatives

7.1 New Orbal

Description - Similar performance as the existing Orbal oxidation ditch was assumed. This prescribes a 1.4 MG Orbal oxidation ditch with either disc aerators or fine-bubble diffusers.

Capital and O&M costs – The estimated capital cost for this alternative for secondary treatment was $7.4 million. The estimated annual O&M cost was $241,000 which included energy for aeration, mixing and pumping, chemical usage, and an additional operator.

Advantages and disadvantages - The advantage of this alternative is that it would use existing technology which could streamline maintenance. The disadvantages of this alternative are that is has a larger footprint due to the shallow operating depth, does not solve any of the current operational issues of the existing Orbal such as poor settling sludge, and provides less process control than other alternatives. This alternative does not easily lend itself to further expansions without building another separate basin which would limit space on site for other future construction.

7.2 New Conventional Activated sludge basin

Description - The second treatment alternative is a 1.4 MG conventional activated sludge tank with fine-bubble diffused aeration, dedicated anoxic zones, and an internal recycle system. New blowers would be housed in a new RAS / WAS pump station.

Capital and O&M costs - The estimated capital cost for this alternative for secondary treatment was $6.5 million. The estimated annual O&M cost was $183,000 which included energy for aeration, mixing and pumping, and an additional operator.

Advantages and disadvantages - The advantages to this alternative are that is has smaller footprint than an Orbal oxidation ditch, it would be easy to expand for future phases with common wall construction, it has dedicated anoxic zones which reduce the likelihood of filamentous bacteria, thus improving settleability and clarifier capacity, and it permits more process control flexibility for staff. The disadvantage of this alternative is that it adds to the complexity of plant maintenance (additional process equipment to maintain).

7.2 New Step Feed Activated sludge basin

Description - The third alternative builds upon the benefits of the conventional activated sludge alternative with the addition of the ability to step feed influent. A step feed system introduces influent to the aeration basin at multiple points in the basin which spreads out the oxygen demand and reduces overall basin volume.Capital and O&M costs - The estimated capital cost for this alternative for secondary treatment was $5.4 million. The estimated annual O&M cost was $183,000 which included energy for aeration, mixing and pumping, and an additional operator.

Advantages and disadvantages - The benefits of this alternative are an even smaller footprint (though with more internal walls), higher solids inventory possible without overloading clarifiers by storing sludge in first pass, improved denitrification without supplemental carbon, and greater nutrient removal reliability because higher inventory protects against peak loads and wet weather events. The disadvantage of this alternative is the increased operational complexity compared to the other alternatives.

Attachment 9: Additional Alternatives Considered

8. Selected Alternative

8.1 Recommended Alternative Justification

Based on the lower cost estimates, smaller estimated footprint, and higher operational efficiency, the Conventional Activated Sludge with Step Feed option is recommended for the liquid stream improvement. The selected alternative also includes a new Headworks building with greater redundancy, two new secondary clarifiers, modification of the existing Orbal to meet anticipated discharge permits, a new UV facility, expanded aerobic digesters, and a new dewatering facility to provide redundancy and room for expansion.

8.2 – Technical Description and Design Parameters

- The Influent Pump Station houses submersible pumps and wet wells that pump the raw wastewater to the headworks facility. The design capacity for pumps (3 duty + 1 standby) is 1.7 MGD each.
- The Headworks Building houses mechanical screening, grit removal equipment, and an influent flow meter and sampler. The mechanical screens' (1 duty + 1 standby) peak hour capacity is 4.84 MGD each. The grit removal system will be a vortex type with design flow capacity of 4.84 MGD.
- The secondary treatment system consists of modifications to the existing Orbal system (0.12 MG additional volume) and a new Step Feed Activated sludge system (1.35 MG). The system utilizes anaerobic, anoxic, and aerated zones to meet the new preliminary effluent limits. Major equipment include internal Mixed Liquor Recycle pumps (2 in the new basin with 1,100 gpm capacity and 1 existing in the Orbal), compressors (1 duty +1 standby) for anoxic mixing, and high speed turbo blowers (1 large duty + 1 large standby + 1 small duty) with a firm capacity of 2,820 scfm for aeration.
- The new Step Feed basin is followed by 2 new, circular center-feed secondary clarifiers that are 45' in diameter. Both the old and new clarifiers will be fit with launder covers. The pumps for this system include 1 scum pump (50 gmp capacity), 2 duty + 1 standby RAS pumps (520 gpm total capacity) and 1 duty + 1 standby WAS pumps (35 gpm capacity).
- The UV facility houses 1 duty and 1 future channel to accommodate vertical UV lamp banks. The flow capacity is 4.84 MGD peak hour flow and meets a minimum UV dose of 30 mJ/cm2.
- The biosolids treatment consists of Aerobic Digestion and dewatering. The Aerobic Digesters (0.38 MG existing and 0.26 MG new) meet a minimum of 480 degree C – days and have positive displacement blowers (3 existing and 5 new) with a combined firm capacity of 6,335 scfm for aeration. Dewatering is accomplished by a new screw press with a rated capacity of 595 lb/hr and 84.9 gpm.

8.3 New PFD

Attachment 10

8.4 – Appropriateness of Treatment Technologies

The proposed processes were recommended in the recently completed WWTP master plan after thoroughly reviewing incoming flows and loads for present and future. Technologies for this facility were evaluated based on their ability to meet the proposed discharge limits as reliably and efficiently as possible. Process model calibration was used to assess the characteristics of the influent to the WWTP, evaluate the ability of proposed technologies to handle projected flow and load increases, and to develop control strategies for maintaining consistent effluent quality. The proposed treatment processes are industry standard, commonly used, and appropriate to meet discharge limits given the anticipated influent wastewater quality. The design contains flexibility and backup systems in case of plant upsets due to sudden industrial slug loads, such as swing aeration zones for additional ammonia removal, back up chemical feeds for settleability and phosphorus removal and denitrification, and step feed capability to retain biomass during a high flow event. The selected technologies provide redundancy in case of equipment failure for reliable treatment.

8.5 - Environmental Impact

Because all work for the WWTP improvements would take place within the Town's existing property for the plant, no direct impacts to sensitive resources are anticipated. Based on the project scoping letters sent to agencies in July 2021, the State Historic Preservation Officer (SHPO) indicated the project would have no adverse effect to historic resources; the United States Fish & Wildlife Service (USFWS) provided a No Effect determination for federally listed species; and the United States Army Corps of Engineers (USACE) confirmed a Clean Water Act permit is not needed for the project. Structure elevations in the project design place structures above the base flood elevation of the effective floodplain and WWTP improvements are outside the preliminary floodplain. Larimer County has indicated a CLOMR/LOMR for the project will not be needed. Within the planning area, secondary impacts associated with future development served by the WWTP are possible, but not unknow at this time. Policies in the Town's Comprehensive Plan 2021 will serve to reduce potential secondary impacts through higher-density residential, preservation of agricultural land, and preservation of open space along natural stream corridors.

8.6 – Land Requirements

All work and new structures for the WWTP expansion would be contained within an area that is currently owned by the Town. No new land or easements would need to be acquired. The existing access road to the site would be maintained.

8.7 – Construction Challenges

There are no significant construction or operational challenges expected at this time. A geotechnical report provided soil bearing capacities and over-excavation recommendations. A high groundwater table may occur during the spring, so the contractor will time excavations and the need for groundwater pumping accordingly.

8.8 – Operational Aspects

CDPHE – include staffing for O&M, 24-hour notification and ORC requirements

It is expected that the proposed design will require one additional person for the staff to accomplish operation and maintenance. The following treatment processes will require certain operator certification classes for a facility with 1.75 MGD rated capacity:

- Preliminary treatment – mechanical screening and grit removal require Class B
- Secondary Treatment – activated sludge (step feed and oxidation ditch) require Class B
- Secondary Clarification – secondary clarifiers require Class B
- Advanced Treatment – a suspended growth system with dedicated anaerobic reactors meant to facilitate biological phosphorus removal requires Class A
- Disinfection – UV radiation requires Class B
- Effluent Discharge – receiving stream requires Class C
- Solids Handling – aerobic digestion and mechanical dewatering with polymer addition require Class B

Thus Class A certification will be required for this facility due to advanced treatment requirements in order to achieve the preliminary effluent limits.

Process control complexities include:

- aeration and mixing control via blowers, compressors, and disc aerators to maintain dissolved oxygen setpoints and anoxic / anaerobic conditions in the oxidation ditch, step feed basin and aerobic digesters.
- SRT, internal mixed liquor return, and step feed flow splitting controls via gates and pumps on VFDs to maintain optimal conditions for denitrification with minimal supplemental carbon.
- DO, pH, ORP, TSS, NO3, and NHx instrumentation that are required to inform the above mentioned controls will require routine maintenance.

Controls and procedures for alerting operation personnel of treatment challenges include:

- Influent flow meters and influent samplers to indicate changes in influent quality
- High flow level alarms in pump stations throughout the facility to indicate equipment failure
- 24-hr notification of motor failures of major equipment
- Flow-paced dosing controls when chemical feeds engaged

8.9 –Capital Costs

Capital costs obtained from the Town’s CMAR Contractor (Moltz Construction) at the 30% design level are presented below.

Total Construction Costs (includes General, Site Civil, Yard Pipe, Headworks, Influent Pump Station, Aeration Basin, Secondary Clarifier Splitter Bos, Secondary Clarifiers 5 & 6, Step Feel Process Building, Orbal Anaerobic Selector Box, UV & Blower Building, Aerobic Digesters 5 & 6, Existing Digesters 1 – 4, Admin Building, and Lab & Control Building): $34,845,025.

VE Savings: $1,842,300.

Subtotal: $33,002,725.

Construction Manager Fee (6.5%): $2,145,177

Subtotal: $35,147,902

Bonds & Insurance (1%): $351,479

Total: $35,499,938

Contingency (10%): $3,549,938

Total Including Contingency: $39,049,319

Cost table:

Secondary: 72%

Advanced 27.5%

Reuse 0.5%

Everything else 0%

Provide an estimate of projected increase in avg monthly user charges

Rate increases are based on an assumed variable growth percentage. Since 2014 the Town has experienced an average growth rate of approximately 6%. Until the new plants (both WTP and WWTP) are constructed and operational in 2024, the Town plans to limit growth to approximately 3% through the issuance of building permits and coordination with local developers (300 residential permits issued through 2023). Following 2024, the fees are based on an assumed growth rate of approximately 4.5% with a yearly growth rate decrease of about 0.1%.

8.10 – Green Project Reserve

The following green components will be incorporated into the selected alternative:

- Proposed pumps and blowers will be equipped with variable frequency drives to increase operation efficiency.
- Fine bubble diffusers in the new Step Feed Basin which have higher oxygen transfer efficiency for given electrical demand.
- Dedicated anoxic and anaerobic zones in the Step Feed basin will facilitate denitrification and biological phosphorus removal without the use of supplemental carbon or metal salts.
- The existing Orbal® train will also have a dedicated anaerobic zone and regions of high and low aeration to promote nutrient removal. Implementation of denitrification to the system will reduce the overall oxygen demand and energy use.
- The lower Total Nitrogen and Total Phosphorus effluent will lower the nutrient load on the receiving water.
- Efficient irrigation of site with moisture sensors
- Installation and use of non-potable water system to reduce demand on Town water.

- Use of native seed in landscaping
- Addition of Permeable pavement and removal of some existing impervious pavement to reduce urban runoff
- Water efficient plumbing and components (water heater, toilets, shower heads etc)
- LEED building components where possible (skylights, windows, insulation, translucent panels, etc.)
- Use of recycled materials (e.g. reuse of excavated dirt as backfill)
- Recycling concrete and asphalt demo material

8.11 – Environmental Checklist

Attachment 12

8.12 – Project Implementation Schedule

Attachment 13

Summary:
Request PELs 11/2020
Site app submittal 9/2021
PDR BODR submittal 12/2021
Final plans and specs submittal 3/22
Discharge permit
Misc permits
Public meeting date TBD
Loan app submittal: 1/2022
Ad for bids pub date 1/2021
Construction contract award date 6/2021
Construction completion date: 2/2024

9. Projecting Water Flows Method 1

Assumptions/Data			Information Source
Current System Population	10431	People	Colorado State Demograp
Current Service Area Population (If providing water to neighboring community)		People	
Population Growth Rates	4.2	% increase/year	The Town of Wellington a
Average Daily per Capita Flow Rate	60.6	Gallons per capita day	Wellington WWTP Masterp
Average Day Maximum Month per Capita Flow Rate	68	Gallons per capita day	Wellington WWTP Masterp
Maximum Daily per Capita Flow Rate	76	Gallons per capita day	estimated for this form b
Peak Hour Factor	3.1		Wellington WWTP Masterp
Average Influent BOD5 Concentration	320	mg/L	Wellington WWTP 2019 D/
Average Day Maximum Month Influent BOD5 Concentration	430	mg/L	Wellington WWTP 2019 D/

Year	System Population	Service Area Population (if different)	Average Daily Flow	Maximum Daily Flow	Peak Hour Flow	Average BOD5 Loading (pounds per day)
+0	0	0	0.63	0.77	1.39	1666
+5	13459		0.81	0.91	2.52	2139
+10	16812		1.01	1.13	3.13	2672
+15	20602		1.23	1.38	3.82	3275
+20	24647		1.47	1.65	4.57	3918

10. Projecting Water Flows Method 2

Not selected.

Attachment 1 – Engineer Seal

Jacobs
2725 Rocky Mountain Avenue
Suite 330
Loveland, CO 80538
Phone: 720.286.6024

September 27, 2021

Mark Henderson
Grants and Loans
CDPHE
4300 Cherry Creek Drive South
Denver, CO 80246-1530

Subject: Project Needs Assessment for Town of Wellington WWTP Expansion and Improvements Project

Dear Mark:

We are submitting the Project Needs Assessment for review by the CDPHE Grants and Loans Unit. Please let Heather Stewart (Heather.Stewart10@jacobs.com) or myself know if you have any questions or comments.

Sincerely,

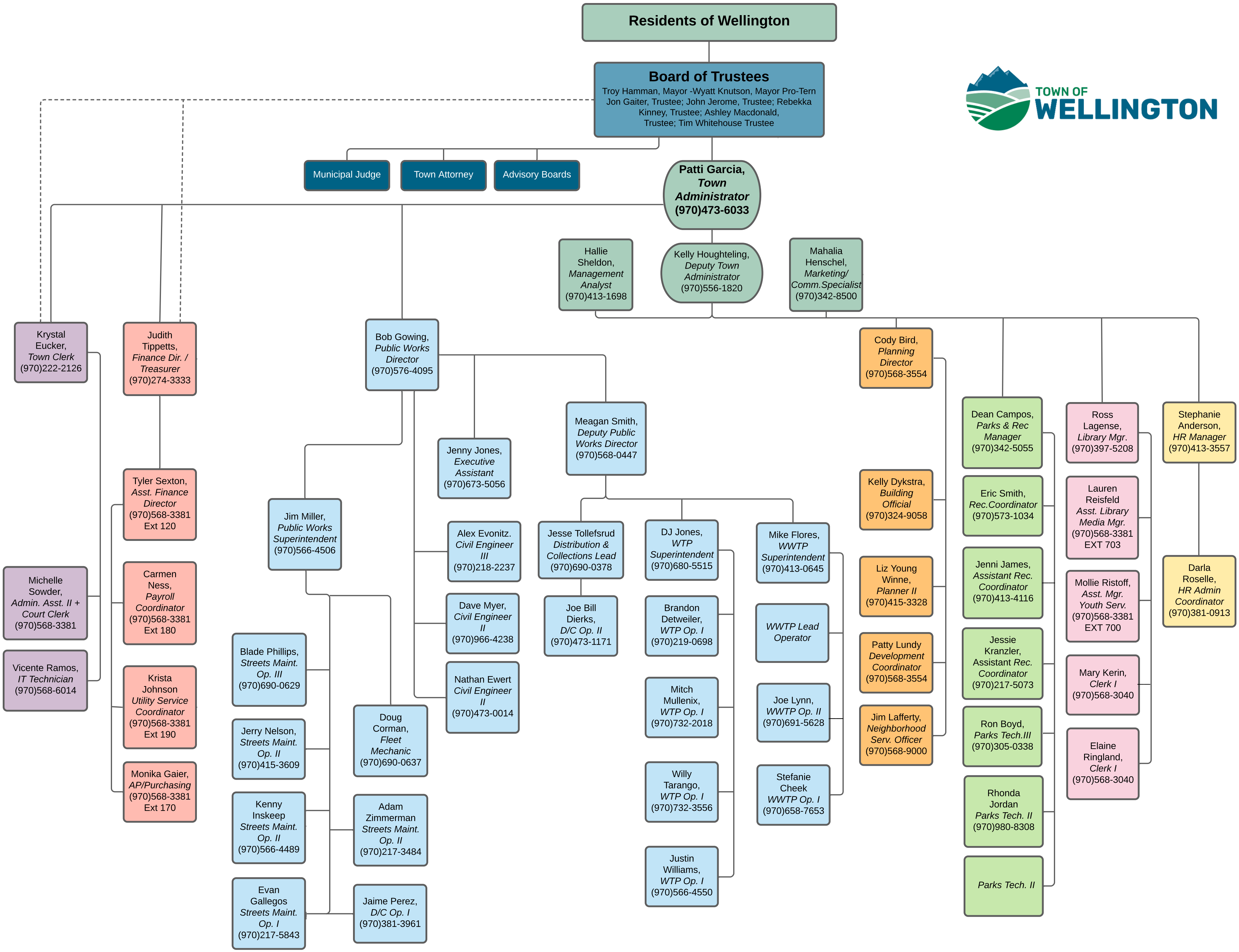
Jacobs Engineering Group Inc.

Kile E. Snider, P.E.
Project Manager

COLORADO REGISTERED
KILE E. SNIDER
31201
9/27/2021
PROFESSIONAL ENGINEER

Cc: Dave Myer/Town of Wellington
Heather Stewart/Jacobs

Attachment 2 – Org Chart



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Krystal Eucker, Town Clerk (970)222-2126
Michelle Sowder, Admin. Asst. II + Court Clerk (970)568-3381
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Mitch Mullenix, WTP Op. I (970)732-2018
Willy Tarango, WTP Op. I (970)732-3556
Justin Williams, WTP Op. I (970)566-4550
Mike Flores, WWTP Superintendent (970)413-0645
WWTP Lead Operator
Joe Lynn, WWTP Op. II (970)691-5628
Stefanie Cheek WWTP Op. I (970)658-7653
Cody Bird, Planning Director (970)568-3554
Kelly Dykstra, Building Official (970)324-9058
Liz Young Winne, Planner II (970)415-3328
Patty Lundy Development Coordinator (970)568-3554
Jim Lafferty, Neighborhood Serv. Officer (970)568-9000
Dean Campos, Parks & Rec Manager (970)342-5055
Eric Smith, Rec.Coordinator (970)573-1034
Jenni James, Assistant Rec. Coordinator (970)413-4116
Jessie Kranzler, Assistant Rec. Coordinator (970)217-5073
Ron Boyd, Parks Tech.III (970)305-0338
Rhonda Jordan Parks Tech. II (970)980-8308
Parks Tech. II
Ross Lagense, Library Mgr. (970)397-5208
Lauren Reisfeld Asst. Library Media Mgr. (970)568-3381 EXT 703
Mollie Ristoff, Asst. Mgr. Youth Serv. (970)568-3381 EXT 700
Mary Kerin, Clerk I (970)568-3040
Elaine Ringland, Clerk I (970)568-3040
Stephanie Anderson, HR Manager (970)413-3557
Darla Roselle, HR Admin Coordinator (970)381-0913

Attachment 3 – Duty Delegation

TOWN OF WELLINGTON

September 3, 2021

Delegation of Duties:

The delegation of duties at the Town of Wellington Wastewater Facility starts with the superintendent of operations working one-on-one with the lead operator to ensure compliance is continually meet. The lead operator works with lower-level operators to get individuals lined out to perform a variety of task on a daily, weekly, and monthly basis. Duties consist of collecting samples to perform process control laboratory analysis, collecting samples to deliver to certified laboratory for compliance testing, preventative/corrective maintenance, dewatering, general housekeeping, along with other task that arise during day-to-day operations.

One general task that is performed by plant operators to ensure the facility's compliance is a rotational 24/7 on-call schedule. Each operator performs this duty for a 7-day period and is expected to respond for every call after hours.

Respectfully,

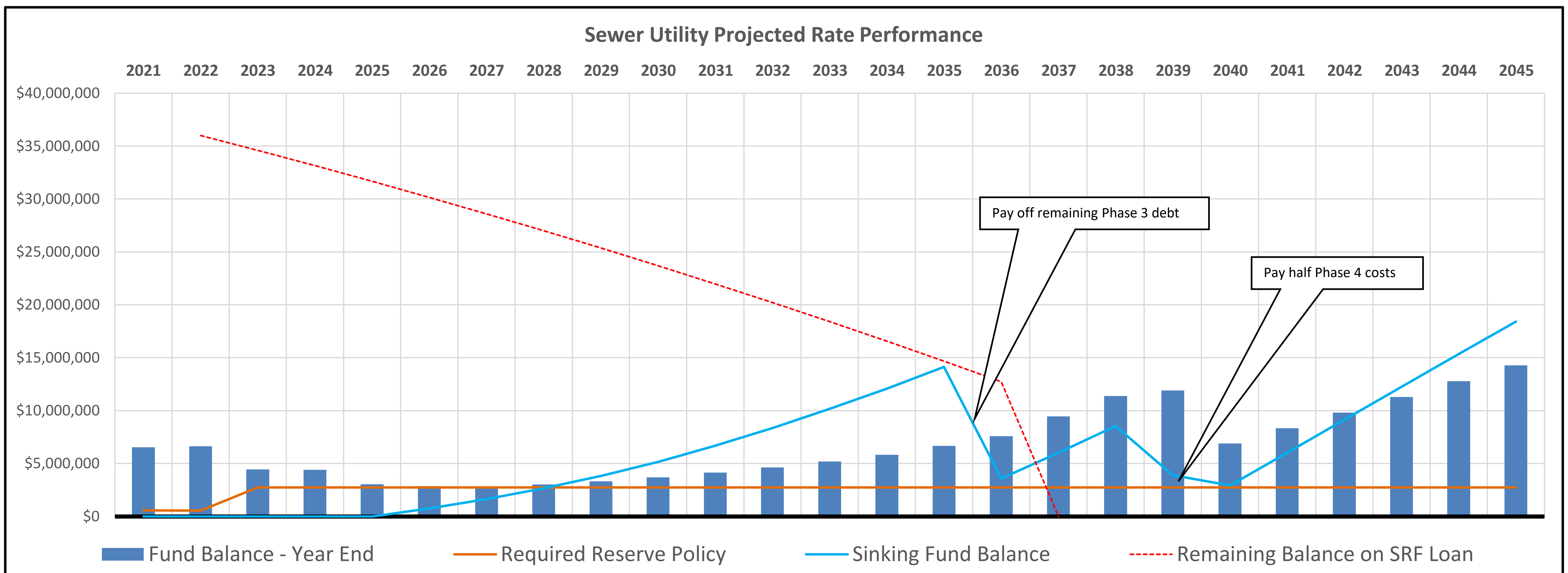
Mike Flores- CWP
Wastewater Superintendent
Town of Wellington, CO
(970) 413-0645
floresma@wellingtoncolorado.gov

Attachment 4 – Proposed Rate Changes

Option 3: Recommended

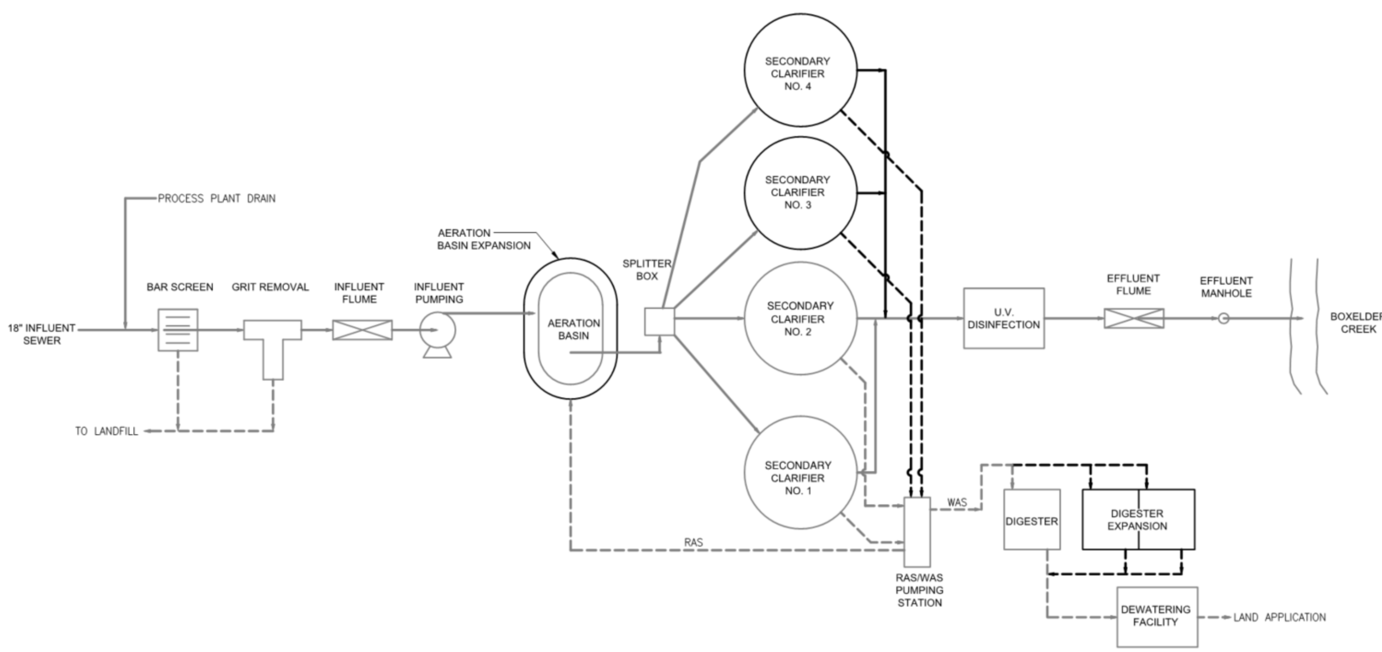
Item	Current Rates	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Impact Fees	$7,500	$7,500	$9,700	$10,000	$10,300	$10,600	$10,900	$11,200	$11,500	$11,800	$12,100	$12,400
Sewer Base Rates	$20.63	$20.63	$36.00	$38.00	$41.00	$43.00	$45.00	$45.00	$45.00	$45.00	$45.00	$45.00
Sewer Usage Rates (per 1,000 gal)	$6.50	$6.50	$13.00	$14.50	$16.50	$18.50	$20.50	$20.50	$20.50	$20.50	$20.50	$20.50
			Reserve Met	Reserve Met	Reserve Met	Reserve Met	Reserve Met	Reserve Met	Reserve Met	Reserve Met	Reserve Met	Reserve Met

Item	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Impact Fees	$12,700	$13,000	$13,300	$13,600	$13,900	$14,200	$14,500	$14,800	$15,100	$15,400	$15,700	$16,000
Sewer Base Rates	$45.00	$45.00	$45.00	$45.00	$45.00	$45.00	$45.00	$45.00	$45.00	$45.00	$45.00	$45.00
Sewer Usage Rates (per 1,000 gal)	$20.50	$20.50	$20.50	$20.50	$20.50	$20.50	$20.50	$20.50	$20.50	$20.50	$20.50	$20.50
	Reserve Met	Reserve Met	Reserve Met	Reserve Met	Reserve Met	Reserve Met	Reserve Met	Reserve Met	Reserve Met	Reserve Met	Reserve Met	Reserve Met



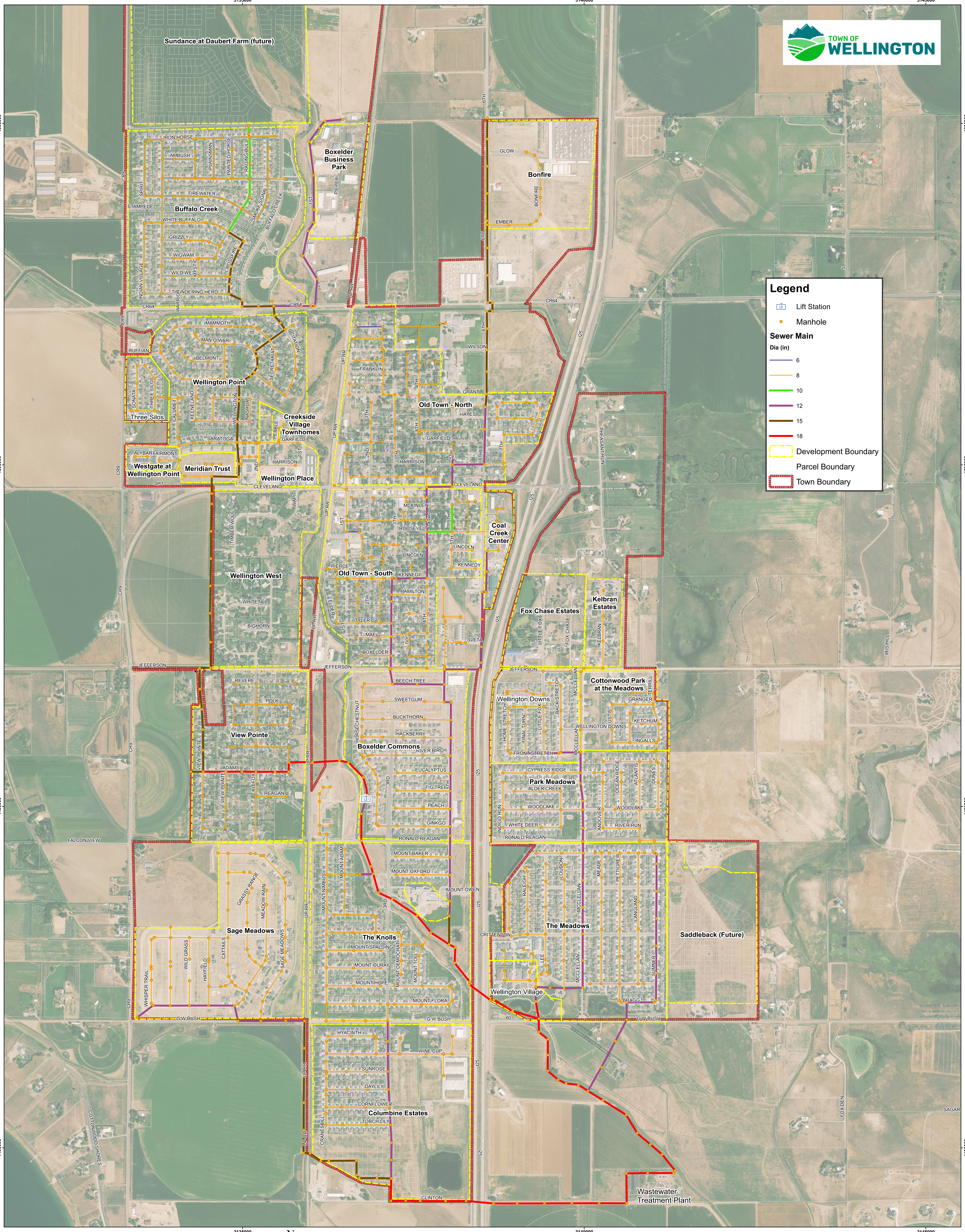
2044	2045
$16,300	$16,600
$45.00	$45.00
$20.50	$20.50
Reserve Met	Reserve Met

Attachment 5 – Process Flow Diagrams



PROCESS PLANT DRAIN
18" INFLUENT SEWER
BAR SCREEN
GRIT REMOVAL
INFLUENT FLUME
INFLUENT PUMPING
TO LANDFILL
AERATION BASIN EXPANSION
AERATION BASIN
SPLITTER BOX
RAS
SECONDARY CLARIFIER NO. 4
SECONDARY CLARIFIER NO. 3
SECONDARY CLARIFIER NO. 2
SECONDARY CLARIFIER NO. 1
RAS/WAS PUMPING STATION
WAS
U.V. DISINFECTION
EFFLUENT FLUME
EFFLUENT MANHOLE
BOXELDER CREEK
DIGESTER
DIGESTER EXPANSION
DEWATERING FACILITY
LAND APPLICATION

Attachment 6 – Collection System Map



InfoMaption Inc.

N
W E
S

0 500 1,000 2,000 3,000 4,000 Feet

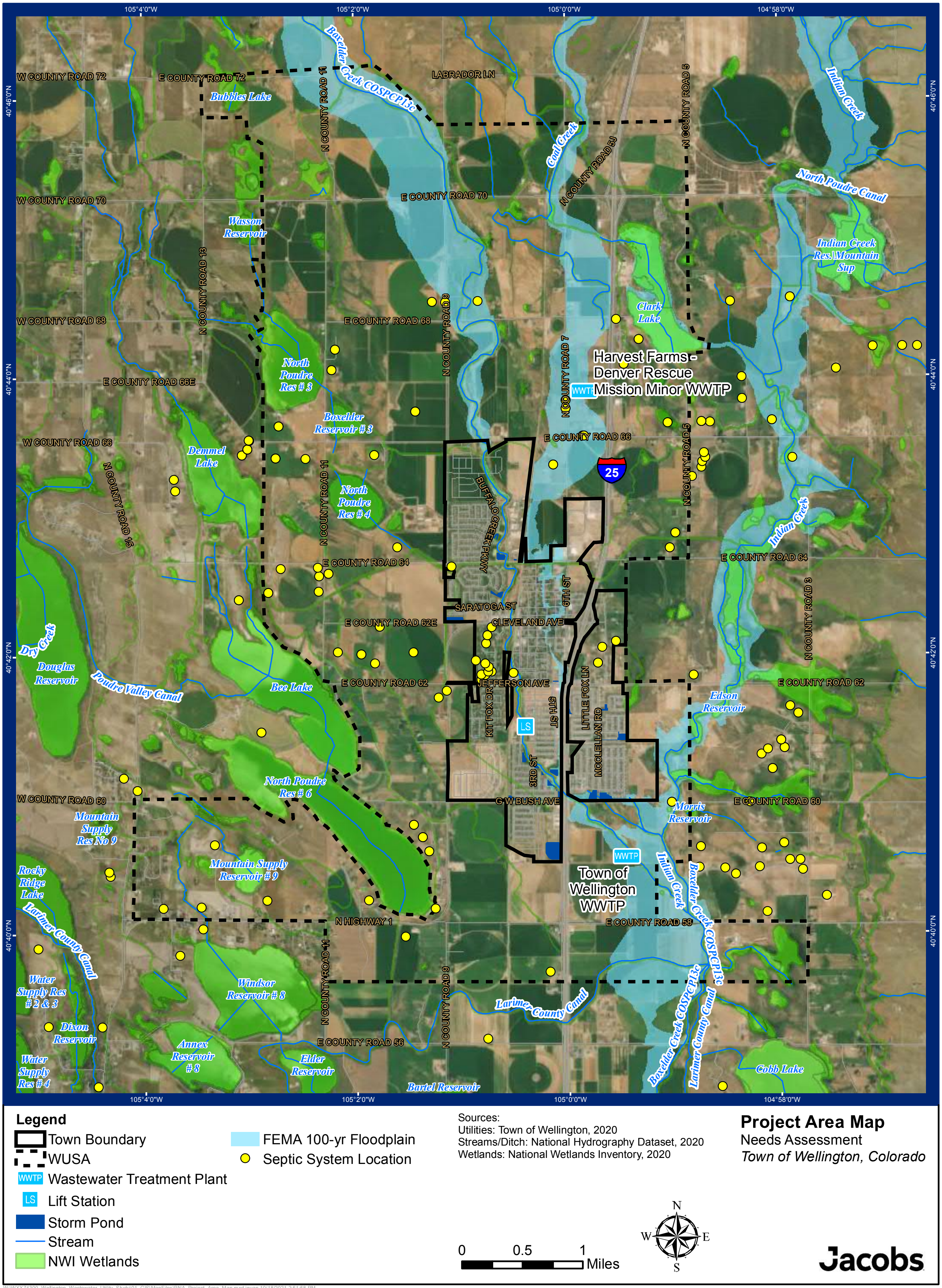
1 inch = 400 feet

Coordinate System: NAD 83 Colorado State Plane North

Town of Wellington Sanitary Sewer System Map

Prepared 11/3/2020

Attachment 7 – Project Area Map



105°4'0"W
105°2'0"W
105°0'0"W
104°58'0"W
40°46'0"N
40°44'0"N
40°42'0"N
40°40'0"N
W COUNTY ROAD 72
E COUNTY ROAD 72
LABRADOR LN
Bubbles Lake
Boxelder Creek COSPCP13c
N COUNTY ROAD 11
N COUNTY ROAD 5
Indian Creek
Coal Creek
N COUNTY ROAD 5J
North Poudre Canal
W COUNTY ROAD 70
E COUNTY ROAD 70
Wasson Reservoir
Indian Creek Res.\Mountain Sup
N COUNTY ROAD 13
Clark Lake
W COUNTY ROAD 68
E COUNTY ROAD 68
N COUNTY ROAD 9
N COUNTY ROAD 7
North Poudre Res # 3
Harvest Farms - Denver Rescue Mission Minor WWTP
WWTP
E COUNTY ROAD 66E
Boxelder Reservoir # 3
E COUNTY ROAD 66
W COUNTY ROAD 66
Demmel Lake
25
N COUNTY ROAD 15
North Poudre Res # 4
BUFFALO CREEK PKWY
Indian Creek
E COUNTY ROAD 64
E COUNTY ROAD 64
6TH ST
SARATOGA ST
CLEVELAND AVE
E COUNTY ROAD 62E
N COUNTY ROAD 3
Dry Creek
Douglas Reservoir
Poudre Valley Canal
Bee Lake
E COUNTY ROAD 62
JEFFERSON AVE
E COUNTY ROAD 62
Edson Reservoir
KIT FOX DR
LS
5TH ST
LITTLE FOX LN
MCCLELLAN RD
3RD ST
North Poudre Res # 6
W COUNTY ROAD 60
G W BUSH AVE
E COUNTY ROAD 60
Morris Reservoir
Mountain Supply Res No 9
Mountain Supply Reservoir # 9
WWTP
Town of Wellington WWTP
Rocky Ridge Lake
Indian Creek
Boxelder Creek COSPCP13c
Larimer County Canal
N HIGHWAY 1
E COUNTY ROAD 58
Water Supply Res # 2 & 3
Windsor Reservoir # 8
N COUNTY ROAD 11
N COUNTY ROAD 9
Larimer County Canal
Boxelder Creek COSPCP13c
Larimer County Canal
Dixon Reservoir
Annex Reservoir # 8
E COUNTY ROAD 56
Water Supply Res # 4
Elder Reservoir
Bartel Reservoir
Cobb Lake
Legend
Town Boundary
WUSA
WWTP Wastewater Treatment Plant
LS Lift Station
Storm Pond
Stream
NWI Wetlands
FEMA 100-yr Floodplain
Septic System Location
Sources:
Utilities: Town of Wellington, 2020
Streams/Ditch: National Hydrography Dataset, 2020
Wetlands: National Wetlands Inventory, 2020
0
0.5
1
Miles
N
W
E
S
Project Area Map
Needs Assessment
Town of Wellington, Colorado
Jacobs

Attachment 8 – Population Projections

Table 1-1. Historical and Projected Town Population

Year	Population	Change in Population Annual	Population Growth (%)
*2013**	6,669		
*2014**	7,090	421	6%
*2015**	7,665	575	8%
*2016**	8,294	629	8%
*2017**	9,430	1,136	14%
*2018**	9,900	470	5%
*2019**	10,431	531	5%
2020	11,415	983	9%
2021	11,802	387	3%
2022	12,119	317	3%
2023	12,375	256	2%
2024	12,855	480	4%
2025	13,459	604	5%
2026	14,085	626	5%
2027	14,732	648	5%
2028	15,403	670	5%
2029	16,096	693	5%
2030	16,812	716	4%
2031	17,544	731	4%
2032	18,289	746	4%
2033	19,048	759	4%
2034	19,820	771	4%
2035	20,602	783	4%
2036	21,396	793	4%
2037	22,198	802	4%
2038	23,008	810	4%
2039	23,825	817	4%
2040	24,647	822	3%

**2013-2019 Population from the State Demographers Office, Department of Local Affairs.*

Attachment 9 – Additional Alternatives Considered

Additional Alternatives considered for Wellington WWTP Improvements

There were two alternatives for biosolids treatment considered.

Alternative for Biosolids 1:

Expansion of the existing aerobic digesters

Description: To achieve a minimum of 400 degree-days, additional tank volume of 600,000 gallons is required. Also, the existing and new digesters should be covered with concrete covers to maintain 20 degrees C in winter. Stabilization in the aerobic digesters should be achieved to avoid excessive odor generation.

Additional blower capacity will be required for the new tank volume. The new blowers will be housed in a new blower building near the new tanks. Telescoping decanting valves with motorized operators will be installed in both the new and existing tanks. Submersible sludge transfer pumps will be installed in the new tanks.

Cost: The estimated capital cost for this alternative for biosolids treatment was $6.7 million. The estimated annual O&M cost was $196,000 which included energy for aeration, mixing and pumping

Advantages and Disadvantages: The advantage of this option is the simpler operation required (less dedicated operator time) and lower capital cost. The disadvantages are a larger footprint required for the basins and higher sludge production to be hauled.

Alternative for Biosolids 2:

ATAD (Autothermal Thermophilic Aerobic Digestion)

Description: ATAD systems operate at higher temperatures (50 to 60 degrees C) than conventional aerobic digestion which reduces the required SRT, produces Class A solids, and provides a greater reduction in solids. ATAD systems typically produce drier dewatered cake than conventional aerobic digestion also.

Current ATAD systems are termed “second generation” ATAD and have better mixing and process control that have resulted in higher volatile solids reduction (VSR), lower product volume, less odor generation, and less sidestream impacts. Although ATAD has a sole provider, the “second generation” ATAD process has been installed at over 62 installations in the United States including the following Colorado installations: Edwards, Fruita, St. Vrain Sanitation District, and South Fort Collins Sanitation District.

The ATAD first and second stage reactors can be retrofit into one of the larger and one of the smaller existing digester tanks taking up half of the existing volume. The remainder of the tanks could be reserved for Phase 4. ATAD equipment (pumps, blowers, and heat exchangers) would be housed in a building adjacent to the reactors. Additionally, sludge thickening is required to approximately 5 to 6 percent prior to introduction of solids to the ATAD first stage reactor. For this evaluation, rotary drum thickeners (RDTs) are assumed as the sludge thickening technology. Odor control is also required for scrubbing the air in the ATAD reactors. A water scrubber and a biofilter are assumed for this purpose.

Cost: The estimated capital cost for this alternative for biosolids treatment was $9.9 million. The estimated annual O&M cost was $247,000 which included energy for aeration, mixing, pumping, thickening, and an additional operator.

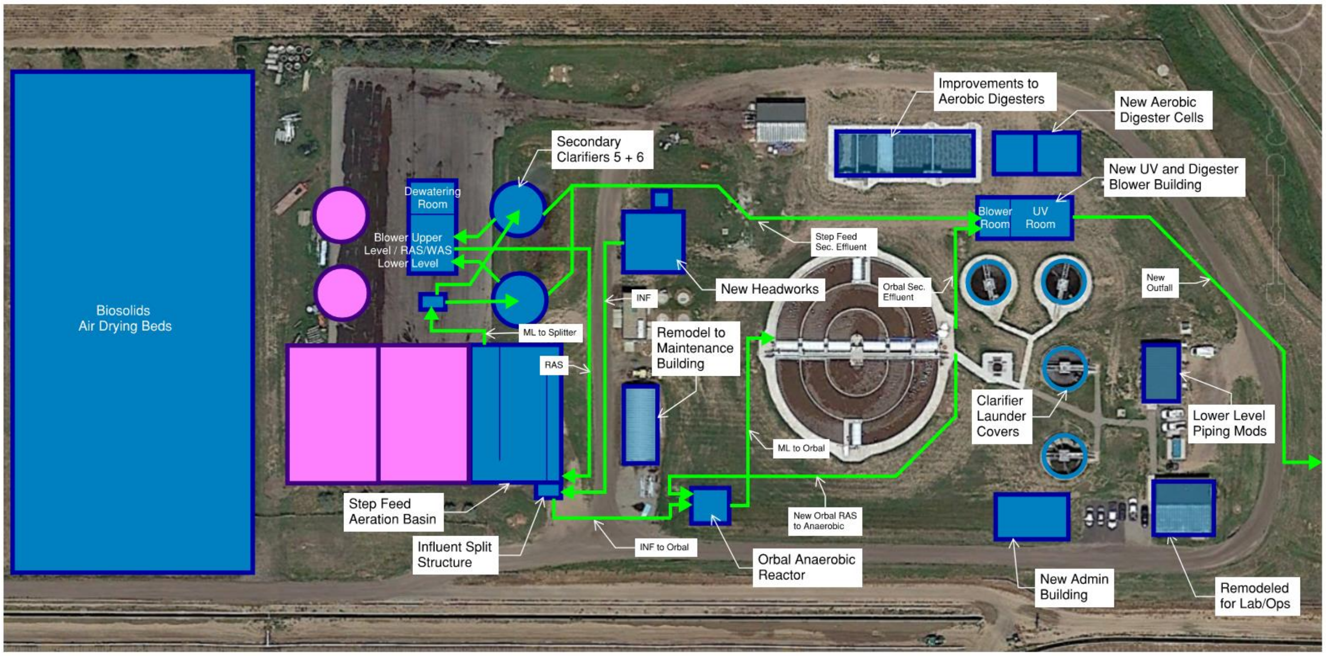
Advantages and Disadvantages The advantages are reduced sludge production and dryer solids, higher biosolids quality (Class A), and utilizes the existing digester volume. The disadvantages are the increased O&M demand on staff and the higher capital cost.

Conclusion

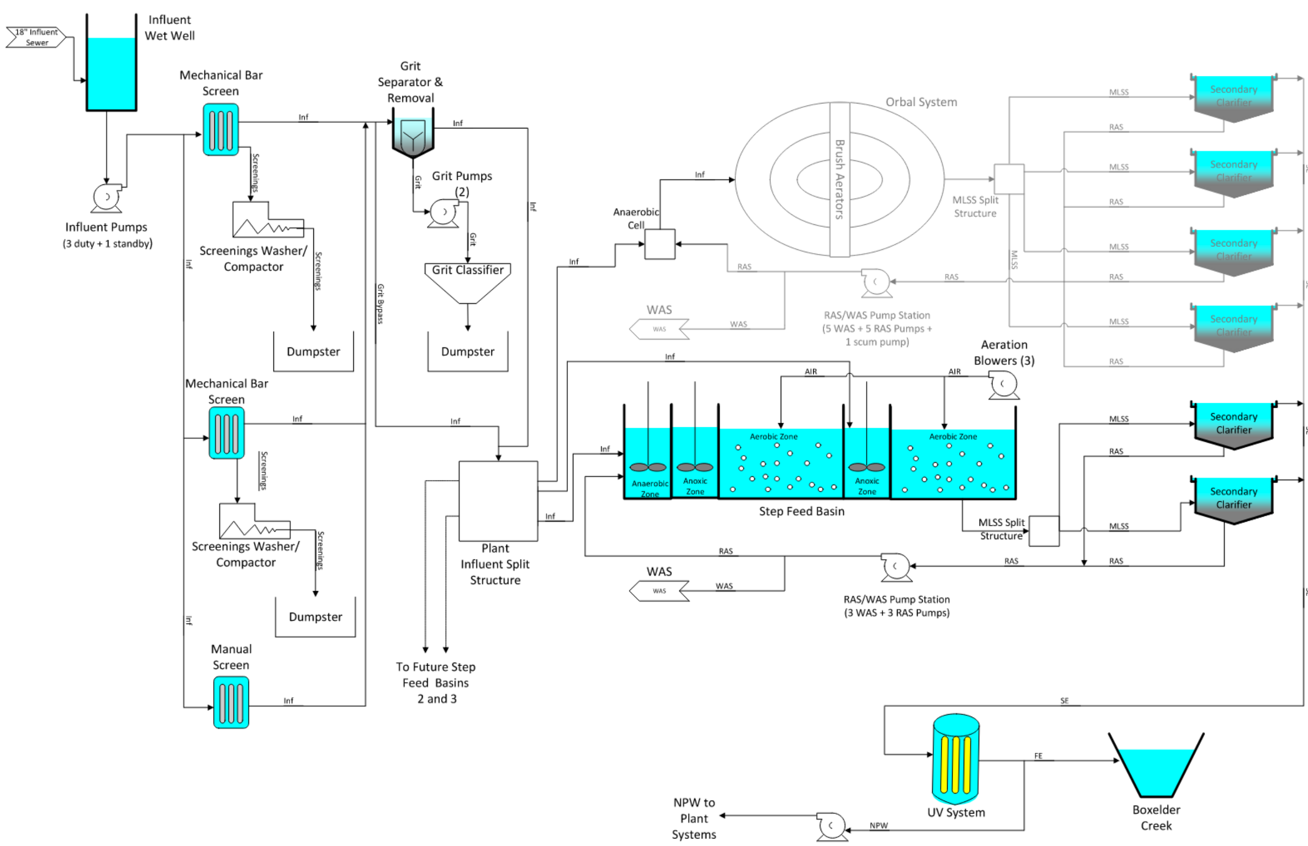
The cost of additional equipment and operator time required for operation of ATAD outweighed the savings of concrete and greater sludge hauling of the aerobic digestion option. Expansion of existing aerobic digesters with improvements was selected.

Attachment 10 – Proposed Process Flow Diagram

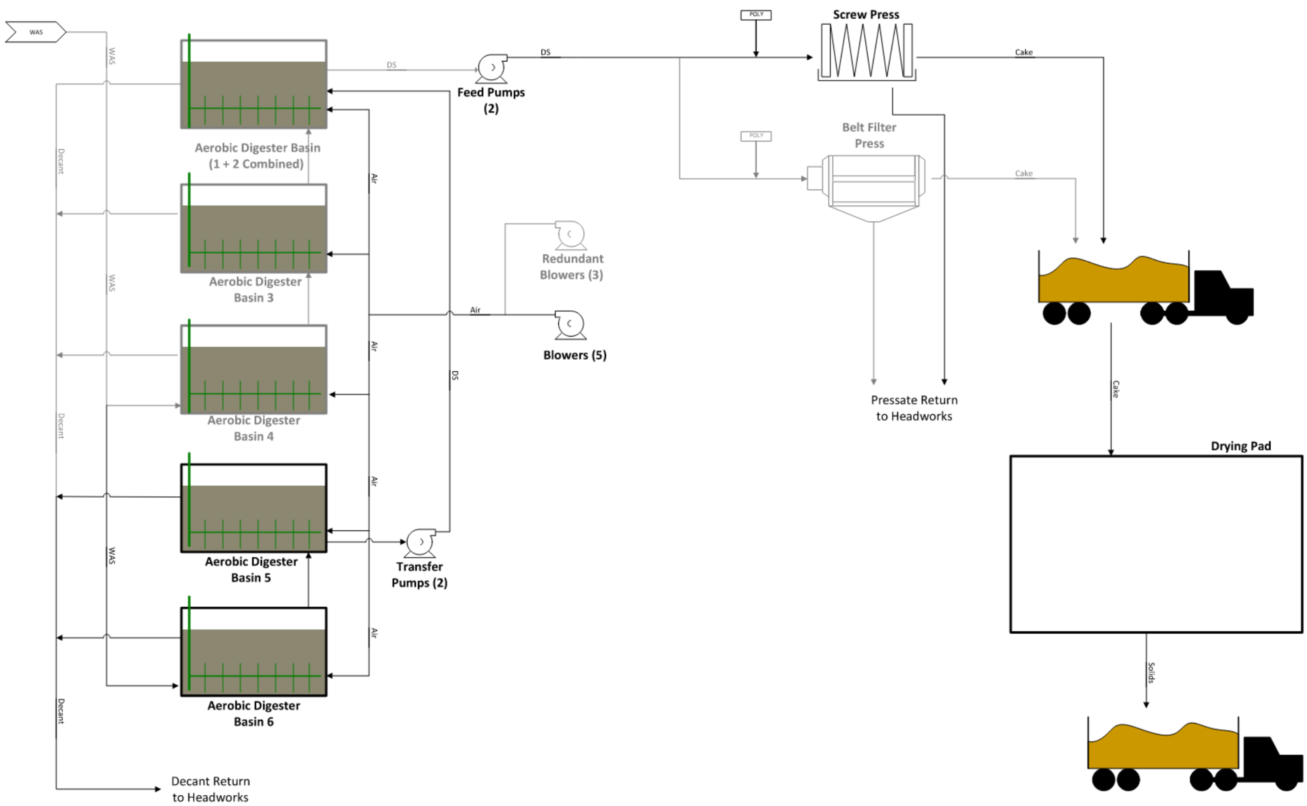
Proposed Site Layout for Phase 3 Expansion



Liquids Process Flow Diagram for Phase 3 Expansion



Solids Process Flow Diagram for Phase 3 Expansion



Attachment 12 – Environmental Checklist

COLORADO
Department of Public Health & Environment

ENVIRONMENTAL CHECKLIST

Use the Discussion and References space at the end of each section to document your responses. For example, explain how you determined the level of impact and document the reasoning if checking PA (possible adverse) for any resource. Attach additional pages if necessary.

1. Brief project description, including identification of selected alternative:

   Wastewater treatment plant (WWTP) expansion 6190 NE Frontage Road, Wellington. The project would increase the plant capacity to 1.75 mgd and includes new influent screening, grit removal, influent pumping, and UV disinfection; additional aeration, clarification, aerobic digestion, sludge dewatering, and administration facilities.

2. Describe if the project will improve or maintain water quality, and if the project addresses a TMDL, and/or Watershed Management Plan.

   Improvements would reduce nitrogen and phosphorus concentrations in the effluent to Boxelder Creek. The project addresses anticipated limits (from the CDPHE Preliminary Effluent Limits) for Total Inorganic Nitrogen (TIN), ammonia as nitrogen, E. coli, and Total Residual Chlorine (CDPHE 2021a)

3. Provide latitude and longitude of the proposed project (if a transmission / distribution / collection line identify the center point not the whole line):

   40°40'32.96"N / 104°59'30.03"W

4. Provide discharge (WW) or source (DW) information: N/A ☐

   Current effluent requirements for the WWTP are outlined in CDPS Permit Number CO0046451 for discharge to Boxelder Creek; these requirements are expected to be in effect through May 31, 2023. The allowable effluent

5. Provide NPDES/PWSID number:

   CDPS Permit Number CO0046451

6. Provide primary waterbody name and waterbody ID, secondary name (if available), and State designated surface water use:

   Boxelder Creek, 00180469, Agriculture, Aquatic Life Warm Water-Class 2, and Recreation (EPA 2021)

7. Did your analysis consider how this project impacts community planning efforts in other areas (i.e. transportation, housing, etc.)?

The WWTP expansion is consistent with the Town's projected future rates of growth (Town of Wellington 2021b).

Y = Yes N = No PA = Possible Adverse

1. Physical Aspects - Topography, Geology and Soils

Y ☐	N ☑	PA ☐	a. Are there physical conditions (e.g., steep slopes, shrink-swells soils, etc.) that might be adversely affected by or might affect construction of the facilities?
Y ☐	N ☑	PA ☐	b. Are there similar limiting physical conditions in the planning area that might make development unsuitable?
Y ☐	N ☑	PA ☐	c. Are there any unusual or unique geological features that might be affected?
Y ☐	N ☑	PA ☐	d. Are there any hazardous areas (slides, faults, etc.) that might affect construction or development?

Discussion and References:

Construction is within existing WWTP plant site with no known issues.

2. Climate

Y ☐	N ☑	PA ☐	a. Are there any unusual or special meteorological constraints in the planning area that might result in an air quality problem?
Y ☐	N ☑	PA ☐	b. Are there any unusual or special meteorological constraints in the planning area that might affect the feasibility of the proposed alternative?

Discussion and References:

The closest city to the planning area is Fort Collins, approximately 13 miles to the south. Fort Collins has an average high temperature of 64 degrees Fahrenheit and

3. Population

Y ☐	N ☑	PA ☐	a. Are the proposed growth rates excessive (exceeding State projections, greater than 6% per annum for the 20 year planning period)?
Y ☐	N ☑	PA ☐	b. Will additional growth be induced or growth in new areas encouraged as a result of facilities construction?
Y ☑	N ☐	PA ☐	c. Will the facilities serve areas which are largely undeveloped areas at present?

Discussion and References:

Projected growth rates from 2021 to 2040 range from 2 percent to 5 percent (Town of Wellington 2021b). The existing wastewater treatment plant (WWTP) operates very

4. Housing, Industrial and Commercial Development and Utilities

Y ☐	N ☑	PA ☐	a. Will existing homes or business be displaced as a result of construction of this property?
Y ☐	N ☑	PA ☐	b. Will new housing serviced by this facility affect existing facilities, transportation patterns, environmentally sensitive areas, or be in special hazard or danger zones?
Y ☐	N ☑	PA ☐	c. Will new housing create strains on other utilities and services - policies, power, water supply, schools, hospital care, etc.?

Discussion and References:

No existing homes would be displaced as a result of the project. Anticipated residential development is expected to occur in the relatively undeveloped Growth Management

5. Economics and Social Profile

Y	N	PA		
☐	☑	☐	a.	Will certain landowners benefit substantially from the development of land due to location and size of the facilities?
☐	☑	☐	b.	Will the facilities adversely affect land values?
☐	☑	☐	c.	Are any poor or disadvantaged groups especially affected by this project?

Discussion and References:

A WWTP has existed at the current location since 2003 and was later expanded in 2016. Improvements to the existing WWTP would be made to meet compliance for

6. Land Use

Y	N	PA		
☐	☑	☐	a.	Will projected growth defeat the purpose of local land use controls (if any)?
☐	☑	☐	b.	Is the location of the facilities incompatible with local land use plans?
☐	☑	☐	c.	Will inhabited areas be adversely impacted by the project site?
☐	☐	☑	d.	Will new development have adverse effects on older existing land uses (agriculture, forest land, etc.)?
☐	☑	☐	e.	Will this project contribute to changes in land use in association with recreation (skiing, parks, etc.), mining or other large industrial or energy developments?

Discussion and References:

The Town of Wellington established a GMA and other land use control measures to promote an urban footprint that is “small and contained” and “preserves valuable

7. Floodplain Development

Y	N	PA		
☑	☐	☐	a.	Does the planning area contain 100 year floodplains?
				If yes -
☑	☐	☐	b.	Will the project be constructed in a 100 year floodplain?
☐	☑	☐	c.	Will the project serve direct or indirect development in a 100 year floodplain anywhere in the planning area?

Discussion and References:

The southeast portion of the WWTP site is within the preliminary 100-year floodplain of Boxelder Creek (FEMA 2020). Development affecting the designated 100-year

8. Wetlands

Y	N	PA		
☐	☑	☐	a.	Does the planning area contain wetlands as defined by the U.S. Fish and Wildlife Service?
				If yes -
☐	☑	☐	b.	Will any structure of the facility be located in wetlands?
☐	☑	☐	c.	Will the project serve growth and development which will directly or indirectly affect wetlands?

Discussion and References:

The project will not directly impact wetlands. It is unknown at this time if future development served by the WWTP will directly or indirectly affect wetlands

9. Wild and Scenic Rivers

Y	N	PA		
☐	☑	☐	a.	Does the planning area contain a designated or proposed wild and scenic river?
				If yes -
☐	☑	☐	b.	Will the project be constructed near the river?

Y ☐ N ☑ PA ☐ c. Will projected growth and development take place contiguous to or upstream from the river segment?

Y ☐ N ☑ PA ☐ d. Will the river segment be used for disposal of effluent?

Discussion and References:

No wild and scenic rivers in planning area.

10. Cultural Resources (Archeological/Historical)

Y ☑ N ☐ PA ☐ a. Are there any properties (historic, architectural, and archeological) in the planning area which are listed on or eligible for listing on the National Register of Historic Places?

If yes -

Y ☐ N ☑ PA ☐ b. Will the project have direct or indirect adverse impacts on any listed or eligible property?

Discussion and References:

No direct impacts would occur to listed or eligible properties. The planning, design, and

11. Flora and Fauna (including endangered species)

Y ☑ N ☐ PA ☐ a. Are there any designated threatened or endangered species or their habitat in the planning area?

Y ☐ N ☑ PA ☐ b. Will the project have direct or indirect adverse impacts on any such designated species?

Y ☐ N ☑ PA ☐ c. Will the project have direct or indirect adverse impacts on fish, wildlife or their habitat including migratory routes, wintering or calving areas?

Y ☐ N ☑ PA ☐ d. Does the planning area include a sensitive habitat area designed by a local, State or Federal wildlife agency?

Discussion and References:

Potential suitable habitat for the Preble's meadow jumping mouse and Ute ladies'-tresses orchid is present within the planning area along wetland and riparian

12. Recreation and Open Space

Y ☐ N ☑ PA ☐ a. Will the project eliminate or modify recreational open space, parks or areas of recognized scenic or recreational value?

Y ☐ N ☑ PA ☐ b. Is it feasible to combine the project with parks, bicycle paths, hiking trails, waterway access and other recreational uses?

Discussion and References:

The project would occur entirely within the existing property boundary of the WWTP facility. Land uses would remain the same and would not eliminate or modify recreational

13. Agricultural Lands

Y ☑ N ☐ PA ☐ a. Does the planning area contain any environmentally significant agricultural lands (prime, unique, statewide importance, local importance, etc.) as defined in the EPA Policy to Protect Environmentally Significant Agricultural Lands dated September 8, 1978?

Y ☐ N ☑ PA ☐ b. Will the project directly or indirectly encourage the irreversible conversion of Environmentally Significant Agricultural Lands to uses which result in the loss of these lands as an environmental or essential food production resource?

Discussion and References:

The project will not directly result in the conversion of agricultural land. The WWTP will serve existing and planned development within the Town's growth management area (GMA), but is not a catalyst for growth. The Town’s future land use map indicates

14. Air Quality

Y	N	PA		
	✔		a.	Are there any direct air emissions from the project (e.g., odor controls, sludge incinerator) which do not meet Federal and State emission standards contained in the State Air Quality Implementation Plan (SIP)?
✔			b.	Is the project service area located in an area without an approved or conditionally approved SIP?
✔			c.	Is the increased capacity of the project greater than 1 mgd?
	✔		d.	Do the population projections used in the facilities plan exceed the Sate or area wide projections in the SIP by more than 5%?
	✔		e.	Does the project conform to the requirements of the SIP? (See EPA regulations under Section 316 of the Clean Air Act.)
	✔		f.	Is the project inconsistent with the SIP of an adjoining State that may be impacted by the Project?
	✔		g.	Does the project violate national ambient Air Quality Standards in an attainment or unclassified area?
	✔		h.	Will the facilities create an odor nuisance problem?

Discussion and References:

The Planning Area (Town of Wellington GMA) does not have a SIP. All Colorado communities are currently in attainment of all National Ambient Air Quality Standards

15. Water Quality and Quantity (Surface/Groundwater)

Y	N	PA		
	✔		a.	Are present stream classifications in the receiving stream being challenged as too low to protect present or recent uses?
	✔		b.	Is there a substantial risk that the proposed discharge will not meet existing stream standards or will not be of sufficient quality to protect present or recent stream uses?
	✔		c.	Will construction of the project and development to be served by the project result in non-point water quality problems (sedimentation, urban stormwater, etc.)?
	✔		d.	Will water rights be adversely affected by the project?
	✔		e.	Will the project cause a significant amount of water to be transferred from one sub-basin to another (relative to the 7-day, 10 year flow of the diverted basin)?
	✔		f.	Will stream habitat be affected as a result of the change in flow or stream bank modification?
	✔		g.	Are stream conditions needed for deciding upon the required limitations inadequately specified in the 208 Plan? If so, have the wasteload allocations calculations been performed and approved by the State and EPA?
✔			h.	Is an Antidegradation Review required?
	✔		i.	Will the project adversely affect the quantity or quality of a groundwater resource?
	✔		j.	Does the project adversely affect an aquifer used as a potable drinking water supply?
	✔		k.	Are there additional cost effective water conservation measures that could be adopted by community to reduce sewage generation?

Discussion and References:

See Attachment 2 for responses.

16. Public Health

Y	N	PA		
	✔		a.	Will there be adverse direct or indirect noise impacts from the project?
	✔		b.	Will there be a vector problem (e.g., mosquito) from the project?

Y ☐ N ☑ PA ☐ c. Will there be any unique public health problems as a result of the project (e.g., increased disease risks)?

Discussion and References:

This is in existing WWTP plant surrounded by agricultural land. The few rural residences in the vicinity are at least 1,500 feet away from the plant. The upgraded plant will not

17. Solid Waste (Sludge Management)

Y ☐ N ☑ PA ☐ a. Will sludge disposal occur in an area with inadequate sanitary landfills or on land unsuitable for land application?

Y ☐ N ☑ PA ☐ b. Are there special problems with the sludge that makes disposal difficult (hazardous, difficult to treat)?

Y ☐ N ☑ PA ☐ c. Is the technology selected for sludge disposal controversial?

Discussion and References:

The Town contracts with a third-party composting company (MacDonald Farms, then A-1 Organics) that is is the business of composting biosolids and other organic waste and

18. Energy

Y ☐ N ☑ PA ☐ a. Are there additional cost effective measures to reduce energy consumption or increase energy recovery which could be included in this project?

Discussion and References:

High-efficiency motors and variable frequency drives will be used to minimize energy consumption. In addition, the Town is pursuing Green Project Fund (GPR) initiative as

19. Land Application

Y ☐ N ☑ PA ☐ a. Has a new or unproven technique been selected?

Y ☐ N ☑ PA ☐ b. Is there considerable public controversy about the project?

Y ☐ N ☑ PA ☐ c. Will the project require additional water rights or impact existing water Rights?

Y ☐ N ☑ PA ☐ d. Is the project multi-purpose?

Discussion and References:

The project is needed to increase capacity, meet more stringent effluent requirements, and replace aging infrastructure.

20. Regionalization

Y ☐ N ☑ PA ☐ a. Are there jurisdictional disputes or controversy over the project?

Y ☐ N ☑ PA ☐ b. Is conformance with the 208 plan in question?

Y ☐ N ☑ PA ☐ c. Is the proliferation of small treatment plants and septic systems creating a significant health problem?

Y ☑ N ☐ PA ☐ d. Have inter-jurisdictional agreements been signed?

Discussion and References:

An intergovernmental agreement was signed in August 2001 between the Town and Boxelder Sanitation District that define wastewater service area boundary overlaps

21. Public Participation

Y ☐ N ☑ PA ☐ a. Is there a substantial level of public controversy?

Y ☑ N ☐ PA ☐ b. Is there adequate evidence of public participation in the project?

Discussion and References:

Town staff has given the Town Board regular project updates at public Town Board

22. Environmental Laws

Y ☐ N ☑ PA ☐ a. Does the project threaten to violate any State, Federal or local law or requirement imposed to protect the environment?

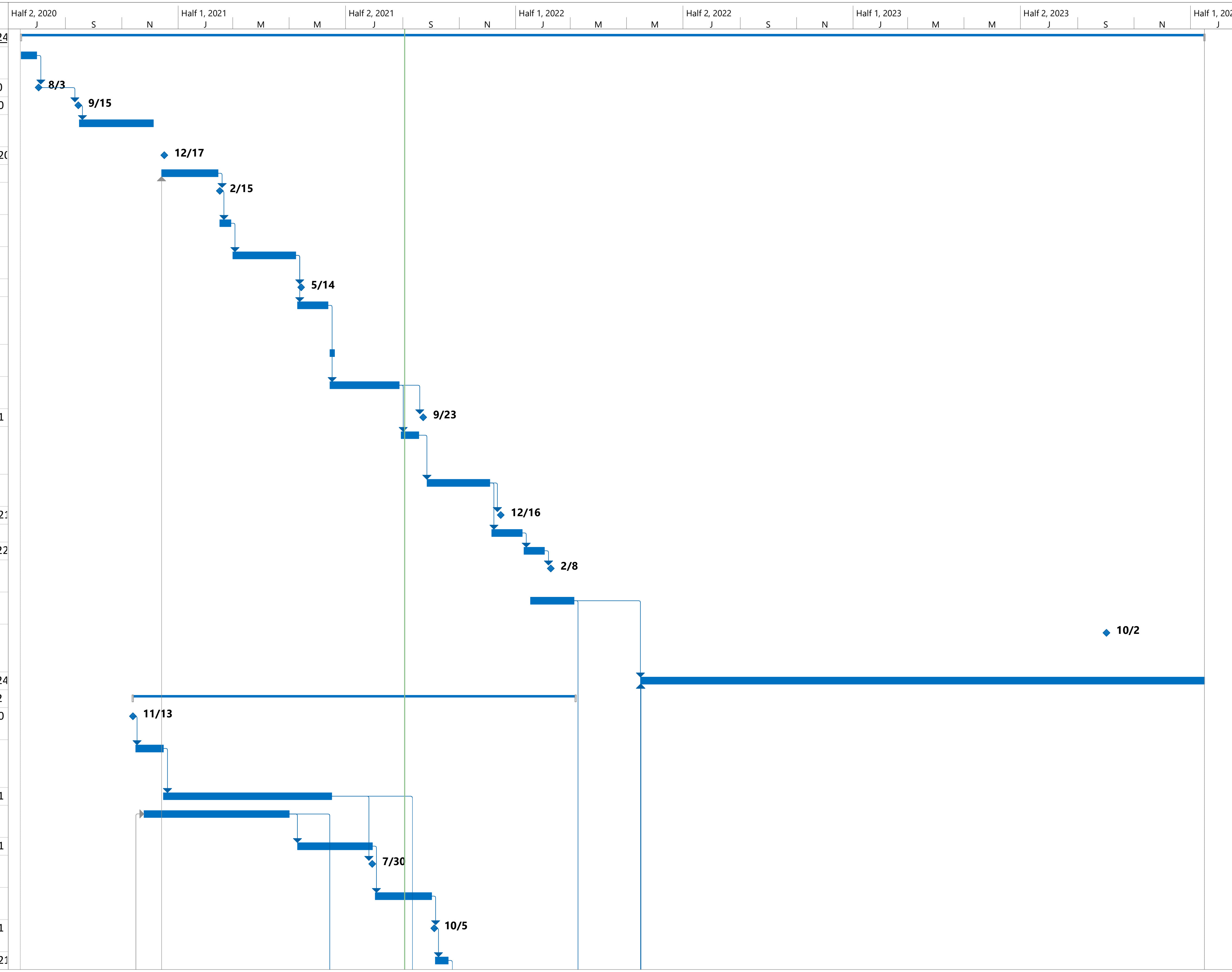
Discussion and References:

Prepared By: Laura Meyer, AICP, Jacobs
Name, Title, and Affiliation

Date: September 1, 2021

Attachment 13 – Implementation Schedule

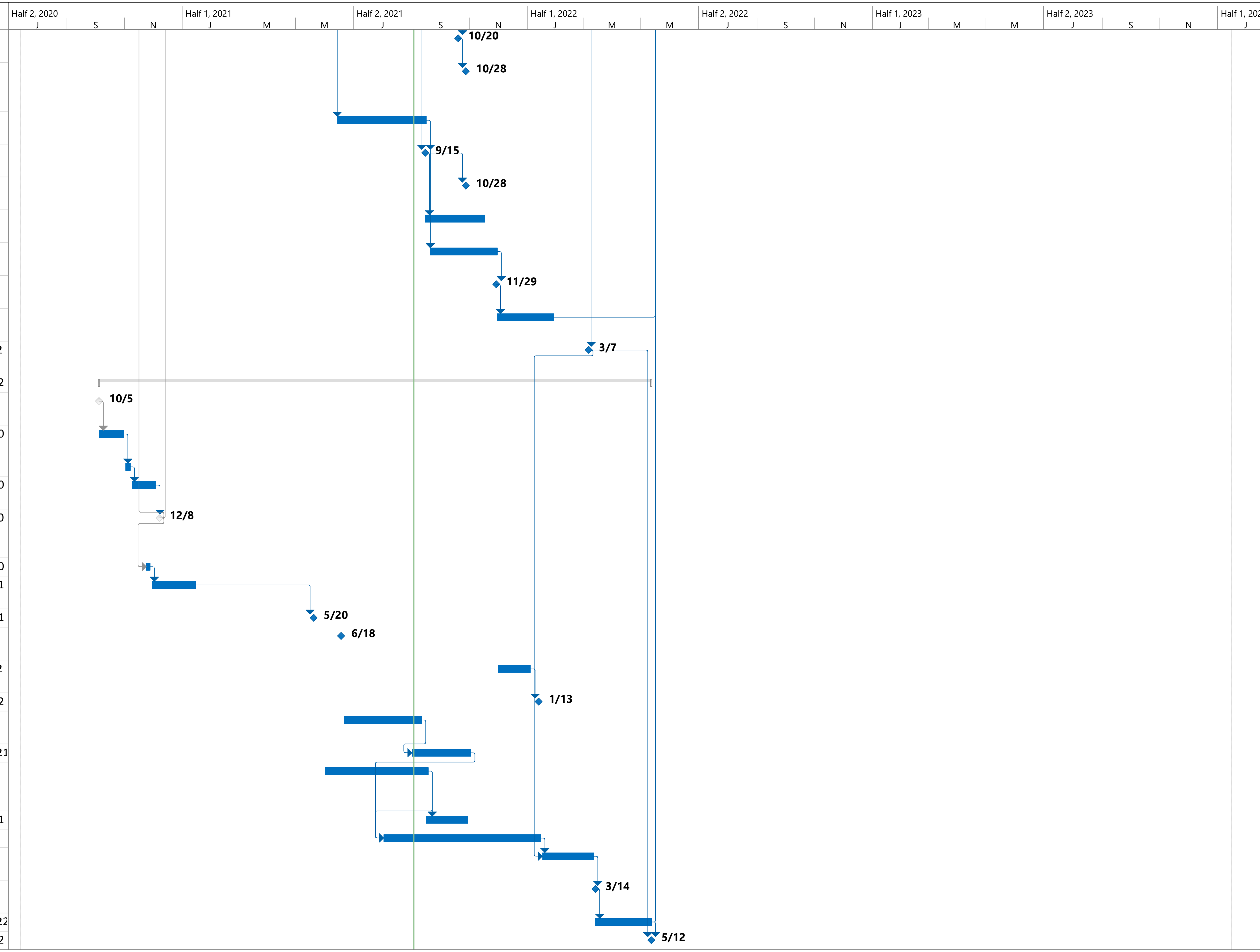
ID	Task Mode	Task Name	Duration	Start	Finish
1		Engineering/Construction	914 days	Wed 7/15/20	Mon 1/15/24
2		Deliver draft WWTP portion of Master Plan	13 days	Wed 7/15/20	Fri 7/31/20
3		Workshop with Town	0 days	Mon 8/3/20	Mon 8/3/20
4		Town Board Presentation	0 days	Tue 9/15/20	Tue 9/15/20
5		Finalization of WWTP porton of Master Plan	58 days	Wed 9/16/20	Fri 12/4/20
6		Design Kickoff Meeting	0 days	Thu 12/17/20	Thu 12/17/2
7		10% Design	45 days	Mon 12/14/2	Fri 2/12/21
8		Workshop to Present 10% Design	0 days	Mon 2/15/21	Mon 2/15/21
9		Town Confirmation of Design Definition	10 days	Mon 2/15/21	Fri 2/26/21
10		Submit 30% Design to Town and CMAR	50 days	Mon 3/1/21	Fri 5/7/21
11		30% Design Review Works	0 days	Fri 5/14/21	Fri 5/14/21
12		Complete Review of 30% Design and CMAR Cost Estimate	25 days	Mon 5/10/21	Fri 6/11/21
13		Potential Hold for Receipt of PELs	5 days	Mon 6/14/21	Fri 6/18/21
14		Submit 60% Design to Town and CMAR	55 days	Mon 6/14/21	Fri 8/27/21
15		60% Design Review Works	0 days	Thu 9/23/21	Thu 9/23/21
16		Complete Review of 60% Design and CMAR GMP Cost Estimate	15 days	Mon 8/30/21	Fri 9/17/21
17		Submit 90% Design to Town and CMAR	50 days	Mon 9/27/21	Fri 12/3/21
18		90% Design Review Works	0 days	Thu 12/16/21	Thu 12/16/2
19		Generation of GMP	25 days	Mon 12/6/21	Fri 1/7/22
20		Review CMAR GMP	16 days	Mon 1/10/22	Mon 1/31/22
21		Board Meeting to Approve GMP	0 days	Tue 2/8/22	Tue 2/8/22
22		Submit 100% Design to Town and CMAR	35 days	Mon 1/17/22	Fri 3/4/22
23		Submit Stormwater Management Plan for WWTP Site	0 days	Mon 10/2/23	Mon 10/2/23
24		Construction Phase	436 days	Mon 5/16/22	Mon 1/15/24
25		Regulatory	341 days	Fri 11/13/20	Mon 3/7/22
26		Submit Preliminary Effluent Limit Application	0 days	Fri 11/13/20	Fri 11/13/20
27		Review by CDPHE and Submit Preliminary Effluent Limit and Design	22 days	Mon 11/16/20	Tue 12/15/20
28		CDPHE Processing of PELs	130 days	Wed 12/16/2	Tue 6/15/21
29		Develop and Submit Draft Utility Plan Update to	113 days	Wed 11/25/20	Fri 4/30/21
30		Update Draft Utility Plan	59 days	Mon 5/10/21	Thu 7/29/21
31		Submit Draft Utility Plan Update to NFRWQPA	0 days	Fri 7/30/21	Fri 7/30/21
32		Review of Utility Plan by NFRWQPA review	45 days	Mon 8/2/21	Fri 10/1/21
33		Review Meeting with NFRWQPA	0 days	Tue 10/5/21	Tue 10/5/21
34		Utility Plan Edits	10 days	Wed 10/6/21	Tue 10/19/21



Project: Wellington WWTP Imp
Date: Fri 9/3/21

Task	Summary	Inactive Milestone	Duration-only	Start-only	External Milestone	Manual Progress
Split	Project Summary	Inactive Summary	Manual Summary Rollup	Finish-only	Deadline	
Milestone	Inactive Task	Manual Task	Manual Summary	External Tasks	Progress	

ID	Task Mode	Task Name	Duration	Start	Finish
35		Resubmit Utility Plan for Backcheck	0 days	Wed 10/20/21	Wed 10/20/21
36		Utility Plan Approval at Monthly Meeting of NFRWQPA	0 days	Thu 10/28/21	Thu 10/28/21
37		Develop Site Application Documents	68 days	Mon 6/14/21	Wed 9/15/21
38		Submit Site Application to NFRWQPA and CDPHE	0 days	Wed 9/15/21	Wed 9/15/21
39		Site Application Approval at NFRWQPA Monthly	0 days	Thu 10/28/21	Thu 10/28/21
40		Site Application Review and Approval by CDPHE	45 days	Wed 9/15/21	Tue 11/16/21
41		Develop Process Design Report Documents	51 days	Mon 9/20/21	Mon 11/29/21
42		Submit Process Design Report to CDPHE	0 days	Mon 11/29/21	Mon 11/29/21
43		PDR Review and Approval by CDPHE	44 days	Tue 11/30/21	Fri 1/28/22
44		Plans and Specifications Self-Cert Submission	0 days	Mon 3/7/22	Mon 3/7/22
45		Funding	418 days	Mon 10/5/20	Thu 5/12/22
46		Issue RFQ for Engineering Services	0 days	Mon 10/5/20	Mon 10/5/20
47		Receive SOQs for Engineering Services	20 days	Mon 10/5/20	Fri 10/30/20
48		Engineering Firm Selection	5 days	Mon 11/2/20	Fri 11/6/20
49		Finalization of Contract for Design and	19 days	Mon 11/9/20	Thu 12/3/20
50		Town Board Meeting Approval of Engineering Services Contract	0 days	Tue 12/8/20	Tue 12/8/20
51		SRF Prequalification Form	4 days	Tue 11/24/2	Fri 11/27/20
52		Prequalification SRF Agency Review	34 days	Mon 11/30/20	Thu 1/14/21
53		Preapplication Meeting	0 days	Thu 5/20/21	Thu 5/20/21
54		Prequalification Review Letter from CDPHE	0 days	Fri 6/18/21	Fri 6/18/21
55		Advertisement for Public Meeting	24 days	Wed 12/1/21	Mon 1/3/22
56		Public Meeting	0 days	Thu 1/13/22	Thu 1/13/22
57		Project Needs Assessment Submission	60 days	Mon 6/21/21	Fri 9/10/21
58		PNA Review by CDPHE	44 days	Wed 9/1/21	Mon 11/1/21
59		Environmental Assessment including Review Agency Referrals	79 days	Tue 6/1/21	Fri 9/17/21
60		EA Review by CDPHE	32 days	Thu 9/16/21	Fri 10/29/21
61		Loan Application	120 days	Mon 8/2/21	Fri 1/14/22
62		WAPA Review of Loan Application	40 days	Mon 1/17/22	Fri 3/11/22
63		WAPA Board Meeting - Loan Approval	0 days	Mon 3/14/22	Mon 3/14/22
64		Loan Execution	43 days	Mon 3/14/22	Wed 5/11/22
65		Fund Distribution	0 days	Thu 5/12/22	Thu 5/12/22



Project: Wellington WWTP Imp
Date: Fri 9/3/21

Task, Split, Milestone, Summary, Project Summary, Inactive Task, Inactive Milestone, Inactive Summary, Manual Task, Duration-only, Manual Summary Rollup, Manual Summary, Start-only, Finish-only, External Tasks, External Milestone, Deadline, Progress, Manual Progress

Attachment 15 – Cost and Effectiveness Certification

Cost and Effectiveness Certification

Project Name: PHASE 3 WASTEWATER TREATMENT PLANT IMPROVEMENTS AND EXPANSION

Borrower: TOWN OF WELLINGTON

As a condition for receiving assistance through the Colorado Water Pollution Control Revolving Fund (WPCRF), I certify that the cost and effectiveness evaluation has been performed per Section 602(b)(13) of the Water Resources Reform and Development Act of 2014 (WRRDA).

This cost and effectiveness evaluation included the following.

A. The borrower has studied and evaluated the cost and effectiveness of the processes, materials, techniques, and technologies for carrying out the proposed project or activity for which assistance is sought under this title; and

B. The borrower has selected, to the maximum extent practicable, a project or activity that maximizes the potential for efficient water use, reuse, recapture, and conservation; and energy conservation, taking into account:

  a. the cost of constructing the project or activity;
  b. the cost of operating and maintaining the project or activity over the life of the project or activity; and
  c. the cost of replacing the project or activity.

KILE E. SNIDER
Licensed Professional Engineer (Printed)

12/2/2021
Date

COLORADO REGISTERED PROFESSIONAL ENGINEER KILE E. SNIDER 31231
12/2/2021

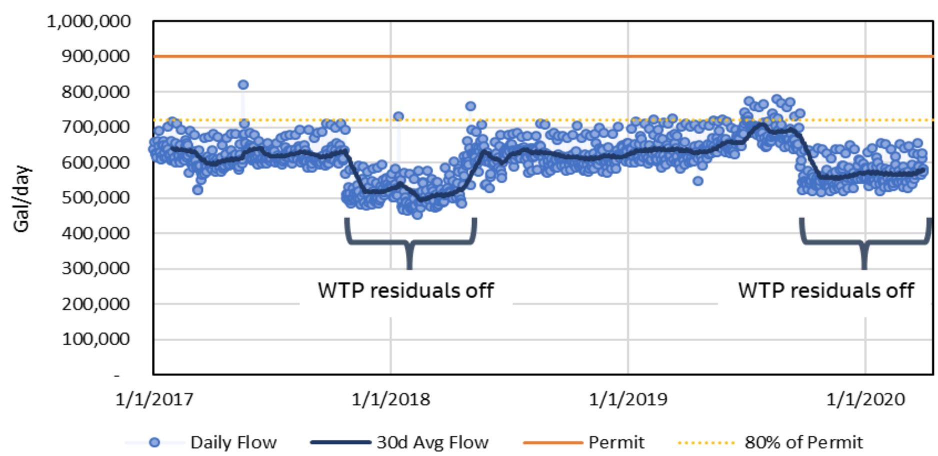
Signature and Stamp of Licensed Professional Engineer

Attachment 16 – Description of Flow Projections

1 Flows and Load Peak Factors

The recent daily influent flow measured at the Wellington WWTP is given in Figure 1-1 in gallons per day (gal/d). The rolling 30-day average is plotted alongside the daily data. The rolling average is used to evaluate trends and to calculate the current maximum month flows which are then used to project future values associated with population growth. In the Fall of 2019, there were many days that exceeded 80% of the permitted flow (720,000 gal/d). The seasonally used groundwater Nanofiltration Water Treatment Plant (WTP) discharges residuals to the WWTP. The Nano WTP was shut off during the winters of 2017/18 and 2019/20. The corresponding drop in the wastewater influent attributed to the Nano WTP residual flow can be seen in the figure. When the WTP residuals are not entering the WWTP, the WWTP staff have observed a drop in influent alkalinity and the nitrification performance is impacted.

Figure 1-1 Historical Influent Flow



The daily influent BOD and TSS loads are given in the figures below (Figure 1-2 and Figure 1-3). The BOD and TSS exhibit more variability than the influent flow to the plant. A significant number of observations in 2019 were greater than the permitted load of 2,627 lb BOD / day, particularly in the summer. The periodic trends in the TSS load correlate to that of the BOD load.

Figure 1-2 Historical Influent BOD Load

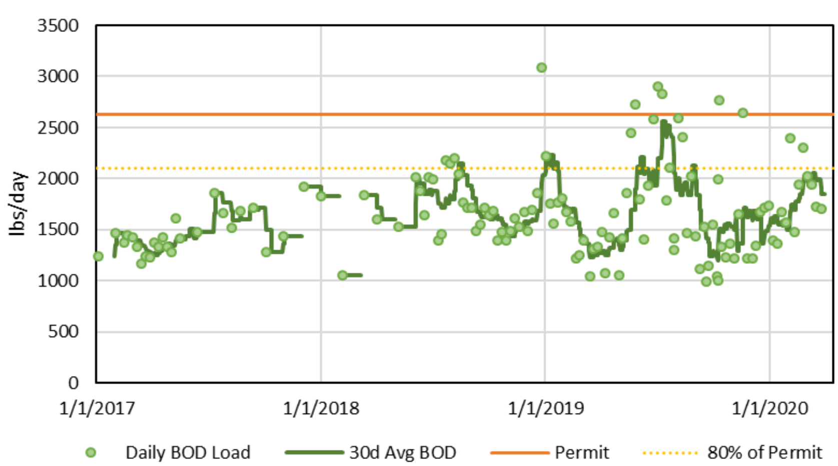
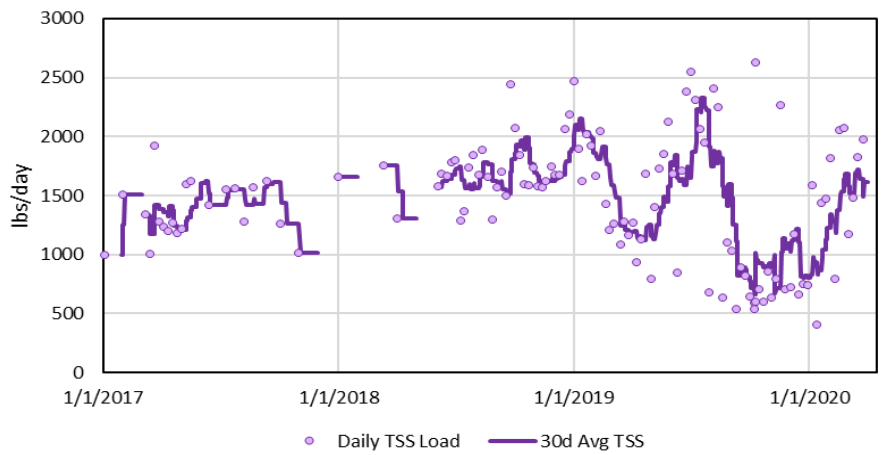


Figure 1-3 Historical Influent TSS Load

The current permit at Wellington has no TSS load limit.



1.1 Assessment of Inflow and Infiltration (I&I) and Per Capita Wastewater Flows

Current flows and loads at the WWTP were used to calculate the per capita flows and loads. The 2019 average daily BOD and TSS loads were divided by the population of 2019 to calculate the annual average load per capita. The ammonia and total phosphorus loads are based on the BOD loads and the ratio of ammonia to BOD and phosphorus to BOD during the influent special sampling campaign and recent historical data. The historic per capita rates are presented in Table 1-1.

Table 1-1 2019 Per Capita Flows and Loads

	Flow	BOD Load	TSS Load	NHx Load	TP Load	Population
Condition	gal/cap/day	lb/cap/day	lb/cap/day	lb/cap/day	lb/cap/day	
Annual Average	60.6	0.16	0.129	0.024	0.004	10,431
Maximum Month	68	0.245	0.223	0.037	0.007	

Historical flows and loads were used to establish peaking factors which provide insight into the collection system I&I. The projected Maximum Month loads for a given year is based on the predicted population of that year, multiplied by the Annual Average load per capita, multiplied by the Maximum Month to Annual Average peaking factor. The peaking factors (ratios of peak values to average values) used for this Plan are based on the 95th percentile of the historical ratios between Maximum Month and Annual Average flows, loads, and temperature. For flow, the Peak Day and Peak Hour peaking factors were also calculated. The peaking factor definitions are given in Table 1-2 and the values are given in Table 1-3.

Table 1-2 Peaking Factor Terms

Term	Definition
AA	Annual Average
MM	Maximum Month (maximum value for 30-day running average or 11/12th percentile of annual data.
PD	Peak Day (maximum value in annual daily data or 364/365th percentile of annual data)
PH	Peak Hour (maximum value in annual hourly data)

Table 1-3 Historic and Recommended Peaking Factors for Influent Flows and Loads

Peaking Factors	MM:AA	PD:AA	MM:AA	MM:AA	MM:AA
Constituent	Flow	Flow	BOD	TSS	Temp
2017	1.06	1.19	1.33	1.19	0.73
2018	1.09	1.25	1.23	1.17	0.68
2019	1.12	1.22	1.54	1.73	0.74
Recommended for Design	1.12	1.25	1.52	1.68	0.68

Peaking Factors	PH:AA
Constituent	Flow
2017	3.42
2018	2.28
2019	2.15
2020	2.14
Recommended for Design	3.1

For BOD and TSS, the historical peaking factors increased as the influent variability increased. The flow, on the other hand, is very stable aside from seasonal residual discharges from the Nanofiltration Water Treatment Plant changes. Looking at the historical influent flow in Figure 1-1, there does not appear to be significant inflow and infiltration (I&I) into the collection system which create significant wet weather flow peaks. The Peak Hour flow peaking factor for design is based on the 90th percentile of the 2017-2020 hourly flow peaking factors; 2020 data was included to make use of recent collection system monitoring and modeling.

2 Population Projection

The 2019 population for the Town of Wellington was 10,431. The Town produced an annual population growth estimate for the Comprehensive Plan for the next 20 years. The actual rate of growth is less critical to the planning process than the projected buildout population, although growth rate clearly impacts the timing of the phased expansions.

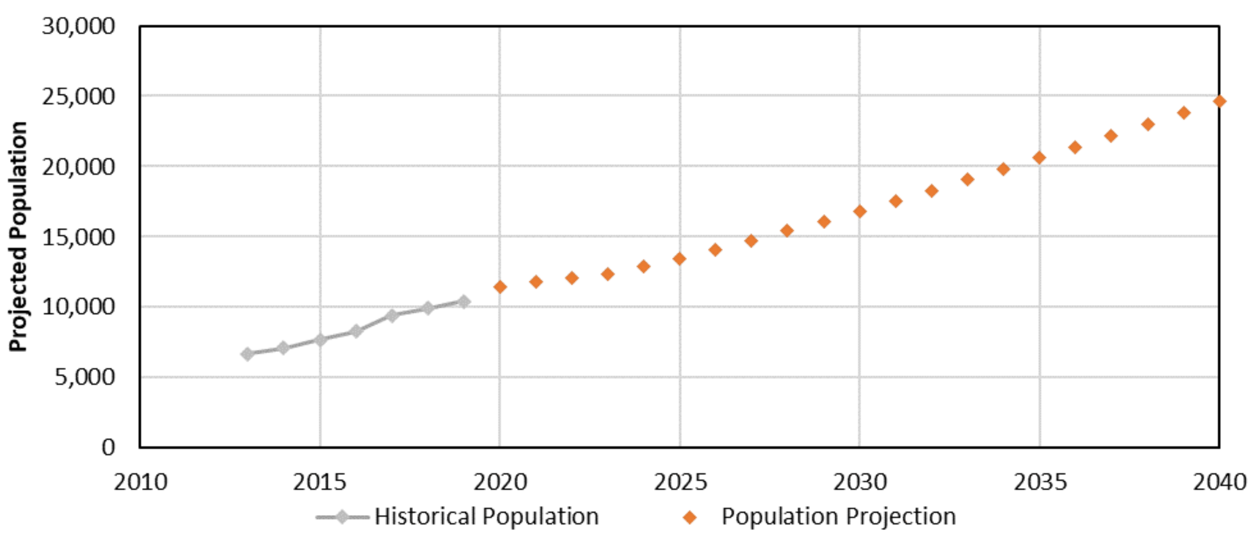
Table 2-1 and Figure 2-1 illustrate the Town's projected population estimates. These annual growth rates are assumed for planning purposes beginning in 2020, however, actual growth in residential population and commercial customers is expected to vary based on development within the Town's service area. Based on the population projections and the flow and load projection analysis described in later sections, phasing recommendations were developed. Historical and proposed plant expansion phases are shown in Table 2-1 below.

Table 2-1. Projected Town Population

Year	Population	Change in Population Annual	Population Growth (%)
2020	11,415	983	9%
2021	11,802	387	3%

2022	12,119	317	3%
2023	12,375	256	2%
2024	12,855	480	4%
2025	13,459	604	5%
2026	14,085	626	5%
2027	14,732	648	5%
2028	15,403	670	5%
2029	16,096	693	5%
2030	16,812	716	4%
2031	17,544	731	4%
2032	18,289	746	4%
2033	19,048	759	4%
2034	19,820	771	4%
2035	20,602	783	4%
2036	21,396	793	4%
2037	22,198	802	4%
2038	23,008	810	4%
2039	23,825	817	4%
2040	24,647	822	3%

Figure 2-1. Historical and Projected Population for the Town of Wellington



3 Wastewater Flow and Load Projections for Wellington

The Town desires additional capacity for civic and industrial water uses in the future. To accommodate this, the following projected per capita flow was developed during the Collection System Masterplan. The projected Maximum Month flow is based on the following calculation:

Flow = 54 gpcd * pop'l in 2019 + 66 gpcd * new pop'l since 2019 + 0.15 MGD from Nano Plant

This approach increases the flow per capita in the collection system for growth post 2019, as requested by the Town. This increase in flow per capita is reasonable given that the Town currently has relatively few non-residential dischargers, but has an intention to encourage more civic, commercial and industrial growth. The flow discharged from the Nano Plant is independent of population, and thus remains a constant in these flow projections.

The future per capita flow contributions are summarized in Table 3-1.

Table 3-1 Future Per Capita Flows

	2019 Population	New Population since 2019	Nanofiltration plant discharges
Unit	gal/cap/day	gal/cap/day	MGD
Maximum Month Flow Contribution	54*	66*	0.15

**This includes industrial, commercial, civic, and residential*

The projected Maximum Month flow for a given year is based on the predicted population of that year in the formula above; the Annual Average flow is calculated from the Maximum Month flow divided by the Maximum Month to Annual Average peaking factor for flow.

The projected Maximum Month loads for a given year are based on the predicted population of that year, multiplied by the Annual Average load per capita, multiplied by the Maximum Month to Annual Average peaking factor for each load. The projected maximum month flows and loads for the planning period are given in Table 3-2.

Table 3-2. Projected Maximum Month Flows and Loads

Year	Flow (MGD)	BOD (lb/d)	TSS (lb/d)	NHx* (lb/d)	TP *(lb/d)
2019	0.71	2,557	2322	279	59
2020	0.70	3,978	3420	324	76
2025	0.91	3,252	2,899	382	90
2030	1.13	4,062	3,622	477	112
2035	1.38	4,978	4,438	585	138
2040	1.65	5,955	5,310	700	165

**The current and projected Ammonia and Phosphorus loads are based on ratios to the BOD load during the special sampling campaign in October 2019 and additional data collection in 2020.*

3.1.1 Projected I&I Analysis

There are currently no indications of significant I&I in the influent to the wastewater treatment plant and this is not expected to change significantly in the future. It is assumed that the Town will continue to manage the wastewater collection system to minimize I&I.