2022 Warrant – Project Descriptions

Article 04: WWTF Upgrades

Project Background:

The Wastewater Treatment Facility (WWTF) has historically been operated using only one of two available treatment carousels at a time. As flows continue to increase at the WWTF, we are approaching the limit of capacity for a single carousel. Additionally, the seasonal nature of flows at the WWTF means that only during peak flows (summer tourism) are we approaching the need to operate both carousels at the same time. The current two-carousel system is not meant to regularly swap between one- and two-carousel operation and doing so causes significant upset to the treatment process and weeks of dedicated labor from Precinct staff. This project seeks to investigate providing additional capacity within a single carousel through operational changes and equipment modifications.

Project Details:

Each Carousel currently uses one mechanical rotor to provide both mixing (moving the water through the system) and aeration (adding oxygen to facilitate microbes removing pollution). The west carousel was upgraded in 2012 to a higher efficiency system using the same mechanical rotor principals, and supplemental aeration capacity (via submerged air diffusers) was added in hopes of increasing overall treatment capacity. While the mechanical rotor upgrades did provide energy savings and operational flexibility, the supplemental air portion does not work as designed and actually causes reverse water flow in parts of the treatment system.

This proposed project will look at upgrading, at a minimum, the east carousel with mixing and aeration systems that will provide operational flexibility, additional single-carousel capacity, and hopefully, additional energy savings. Also included is potential replacement of the WWTF backup generator, which is now 24 years old, non-compliant with current air emissions standards, and experiencing potential motor issues.

Project Phases:

- Capacity Study & Evaluation of Alternatives
  This phase is already underway. Preliminary modeling results show there is likely as much as 50% more capacity available in a single carousel. Evaluation of replacement alternatives for the original backup generator for the WWTF is also included in this study. Evaluation of alternatives for upgrades is ongoing.
- Final Design & Construction
  This phase would provide final design and construction of the recommended alternatives for the east carousel, as well as modifications to the west carousel to fix the issues with the 2012 upgrade if budget allows.

Project Funding

- Capacity Study & Evaluation of Alternatives
  Funding for this phase from CRF has already been approved by the Commission. It is included again in the Warrant Article so that the Precinct receives authority from voters to accept up to $100,000 in Planning Grant funds through NHDES. The cost of this phase will not exceed the $100,000 available through NHDES.
- Final Design & Construction
  The estimated cost for this phase is $2.99 Million. The Precinct submitted a pre-application for a Clean Water SRF loan/grant through NHDES in 2021. Given the current availability of federal funding, the Precinct will receive $1,106,300 in ARPA grant and principal forgiveness *before* an additional 20% State Aid Grant. Depending on energy efficiency potential, an additional portion of the project up to $200,000 may receive grant funding through NHDES Energy Efficiency Grant program. Replacement of the backup generator may also be eligible for a 50% federal grant independent of SRF funding.

Net project cost after anticipated grants and principal forgiveness should be in the $1.5 million range, effectively netting the project 50% grant funding. CVFD project share estimated at 30% of net Precinct cost based on 2021 CVFD flows.

Estimated Financial Impact

Estimated Project Cost ~$2,990,000
This project would be tax-funded. Assuming 20-year bond at 2.5% through SRF and based on current (2021) valuations, after receiving principal forgiveness and grant funds and accounting for CVFD's 30% share of the payment, the net tax impact is projected to be in the ballpark of $0.09.

Recommendation

The Precinct should move forward with this project and approve borrowing on the 2022 Warrant. This additional single-carousel capacity will be incredibly valuable to the Precinct immediately and over the coming decades, and it makes sense to take advantage of the available federal funding.

Article 02: Wastewater Sludge Dryer

Project Background:

The Precinct has long had a relationship with the Town of Conway regarding disposal of the sludge produced at the WWTF. Essentially, the Town takes the sludge from the WWTF at its landfill free of charge in exchange for the Precinct taking the landfill leachate free of charge.

Recent developments in PFAS legislation potentially threaten the Precinct's ability to accept leachate from the Town landfill. On top of that, the Town has had difficulty handling the

volume of sludge produced as loadings at the WWTF have increased and on February 2, 2022, notified the Precinct that they can only accept 40% of our sludge over the course of the year. In short, there are several issues that may challenge the future of the "disposal swap" agreement.

This disposal swap agreement has financially benefitted both the Town and the Precinct for many years since the cost of trucking and disposal for both sludge and leachate at other locations would add significant expense to both the Precinct's and Town's operating budgets. Using recent sludge disposal pricing received, the cost of disposal for the total quantity of sludge generated at the WWTF is approximately $400,000 ($280K Precinct share, $120K CVFD share) per year. The Town would also incur significant cost – likely in the same ballpark as sludge disposal - for leachate disposal if this arrangement went away.

Project Details:

This project aims to investigate the feasibility of adding a sludge dryer to the WWTF, and, if financially feasible, design and install a sludge drying process. There are several potential benefits to drying sludge on-site. Right now, our sludge averages around 20% solids, meaning that 80% of our sludge is water. If we can remove most of this excess water:

- Drier sludge is much easier for the Town to handle at the landfill. Think about shoveling mud vs. shoveling sand – it's the same principle.
- By removing water, we reduce the volume and weight of sludge. This would likely allow us to continue disposing of all sludge at the Town landfill since this takes up less volume and benefits the Town in the long run by saving landfill capacity.
- If we need to dispose of sludge at an alternate location (as the Town recently informed us, we must start disposing of 60% of our sludge elsewhere), using a sludge dryer essentially cuts the volume of sludge down to 20% of current volume. This reduces the number of times we need to haul sludge, reducing labor demands and trucking costs as well as ultimate disposal costs.
- The sludge dryer produces what's known as "Class A Biosolids". This is essentially what's in the bag when you buy Milorganite fertilizer at the hardware store. We may be able to dispose of biosolids at no cost to the Precinct in this case, even if we lose free access to the Town landfill, eliminating disposal costs.

Sludge Dryers also come with potential downsides:

- They are energy intensive and expensive to operate. Preliminary estimates put additional fuel use at about 600 – 700 gallons per week (No. 2 fuel oil). Most dryer installations make use of natural gas, but that's not an option here. We are looking into electric heat pump options to try and take advantage of solar production.
- Like any additional equipment of this scale, a dryer comes with additional O&M cost and labor demand.

The project will likely also require a building addition to house the sludge dryer and will require additional sludge storage facilities – those costs are included in the estimate below.

Project Phases:

- Planning
  The initial planning phase is ongoing. There is still work to be done to explore alternatives and financial feasibility.
- Preliminary Design
  The preliminary design phase would dig deeper into selecting a recommended alternative and providing preliminary design drawings. Verification of operational and financial feasibility would be key parts of this phase.
- Final Design & Construction
  This phase will not be undertaken unless the results of the financial feasibility portion of the previous phases were favorable.

Project Funding

Estimated Project Cost: $10,000,000

NH Clean Water SRF funding recommended. Estimated grant and principal forgiveness portion may be as high as 50% (30% principal forgiveness plus 20% SAG), plus eligibility for planning component with additional principal forgiveness up to $100,000. Net project cost estimated around $5 million. CVFD project share estimated at 30% of net Precinct cost. Overall project funding is a bit more complicated for this project, though, because the Town of Conway may be involved in the project to some degree since sludge disposal at the Town landfill is tied to their leachate disposal at the WWTF. As the project advances, discussion will continue about potential cost sharing approaches. Currently, it would break down like this:

- Estimated debt payment on $5M over 20 years @ 2.5% is ~ $320K, while annual O&M are estimated at $205K for a total annual cost of $525K
- Precinct share is $367.5K, CVFD share is $157.5K.
- Potential Town contribution as well, to be investigated further as part of financial feasibility analysis.

Estimated Financial Impact

This project would be tax-funded (debt) and operating budget funded (O&M). Assuming 20-year bond at 2.5% through SRF and based on current (2021) valuations, after receiving principal forgiveness and grant funds and accounting for CVFD's 30% share, the Precinct's net tax impact would be in the neighborhood of $0.30. Annual O&M costs added to the budget would be around $143K after accounting for CVFD's 30% share. Both of those costs are without any Town contribution considered.

Recommendation

Even though we are still in the project development phase and working to fully develop the financial feasibility, it makes sense to place this article on the 2022 Warrant for approval. NCWP will submit an SRF pre-application in June to get on the funding list while waiting for more data to come back from the planning phase. It is recommended we continue funding the planning costs in-house for the time being – they will be eligible for principal forgiveness

and grant reimbursement if we end up moving forward with the project. After continuing our due diligence over the next year, if the project economics prove unfavorable, we have the option of declining SRF funding – but we may never have the opportunity to get the large share of federal funding again if we miss out on it now.

Article 03: Saco River Erosion Mitigation

Project Background:

The WWTF sits adjacent to the bank of the Saco River. Over decades, the Saco has been eroding its bank at the northern end of the WWTF property. The Precinct and NHDES have been working to identify risks to the WWTF and to develop/implement mitigation strategies to stop the riverbank erosion in this area. In 2021, the Precinct received $75,000 in planning funds from NHDES to begin the investigation.

Project Details:

Historical aerial photography shows that the Saco River has consistently moved toward the northern end of the WWTF since 1939. In order to protect the infrastructure at the WWTF, a fluvial geomorphology consultant has been retained to survey and study the reach of the Saco River adjacent to the WWTF. Based upon the results of that initial study, alternatives will be evaluated to stop the migration of the Saco. Following public input, the preferred alternative will be selected and implemented.

Project Phases:

Phase I – River Study and Modeling
This first phase of the project is underway. Interfluve was retained by the Precinct to perform a full survey of the river near the WWTF and develop a hydraulic model of that reach. That model can be used to predict erosion and risk to infrastructure and to propose potential alternatives to mitigate erosion risk. We anticipate completion of this phase in Spring 2022.

Phase II – Feasibility Assessment and Preliminary Design
Interfluve will evaluate the design alternatives presented at the end of Phase I. This process will include additional subsurface investigation, additional modelling, a series of public meetings to provide feedback from all river users, and 75% project design. If approved, this phase would likely be completed in early 2023. Estimated Phase II cost ~ $200,000.

Phase III Permitting and Final Design
After selection of the recommended alternative, permitting and final design will occur. If approved, this phase would likely be completed by fall 2023. Estimated Phase III cost ~ $105,000

Phase IV – Construction of Chosen Alternative
The chosen alternative will be put out to bid for construction in winter 2023/2024 for construction in 2024. Estimated construction cost ~ $7,500,000

Project Funding

Estimated Project Cost is $7,805,000
Indications are that this project will score very well with CWSRF and receive funding through that program. It is estimated that as much as 50% may be covered by grant and principal forgiveness, and Phase II may also receive "planning grant" funds up to $100,000. Using those assumptions, the estimated net cost to the Precinct will be in the ballpark of $3.8 million. CVFD project share estimated at 30% of net Precinct cost. We will also be investigating the potential for FEMA "pre-disaster mitigation funds" for additional offset of project costs – if this project qualifies, the cost to the Precinct would be further reduced.

Costs used in this estimate are based on recent projects of similar size and scope, but the alternative selected will greatly influence the final cost. Construction cost will be a key factor in selecting an alternative to move forward during Phase II.

Estimated Financial Impact

This project would be tax-funded. Using a 20-year SRF note at 2.5% and based on current (2021) valuations, after receiving principal forgiveness and grant funds and accounting for CVFD's 30% share, the net tax impact is projected to be around $0.23.

Recommendation

The Precinct should move forward with this project and approve borrowing on the 2022 Warrant. This project directly impacts the long-term viability of the WWTF location, and frankly, there is no other place for the WWTF to move should the Saco continue eroding the riverbank in our direction. It is critical for the Precinct to take advantage of federal funds for a project of this scale and importance.

Article 05: Country Road Sewer

Project Background:

Residents of the Village at Kearsarge requested that the Precinct investigate adding sewer to the remainder of the development, specifically the southern section accessed by Country Road. A portion of this area is identified in the wastewater master plan as a sewer priority area for groundwater protection. The Commission approved funding for HEB Engineers to evaluate the feasibility and cost of adding sewer to this area. That study has been completed.

Project Details:

The project would involve final design and construction of a sewer system for the lower Country Road portion of the Village at Kearsarge.

Project Phases:

Final Design and Permitting

HEB Engineers would be contracted to perform final design, permitting, and easement layout for the project. Estimated cost of this phase is $128,250.

Construction
The completed design would be put out to bid for construction. Estimated construction cost is $1,258,280.

Project Funding

Estimated Project Cost is $1,390,530.
Sewer extension projects are rarely funded by NHDES SRF, but we will still submit an application since SRF is the best game in town currently. For such a project, RD may provide funding but the percentage of grant funding is likely little or none. The project may also be locally financed or financed through NH Municipal Bond Bank without the potential for federal funding requirements adding cost.

Estimated Financial Impact

This project would be tax-funded. Assuming a 20-year note through NHMBB at 4% and based on current (2021) valuations, the estimated tax impact is in the neighborhood of $0.14.

Recommendations

This project has been brought forward by voters of the Precinct and is supported by the wastewater master plan as a sewer priority area. It is recommended that this project be placed on the 2022 Warrant for consideration by the voters.

Article 06: Water Pressure Zones Connection

Project Background:

The Precinct has two pressure zones in its water distribution system. The two zones can generally be described as the "High Pressure Zone" (HPZ) and "Low Pressure Zone" (LPZ). The HPZ includes everything from Artist Falls Road to the north and uses the Hurricane tank for pressure and storage; the LPZ includes everything south of Artist Falls Road and uses the Pine Hill tank for pressure and storage. 86.4% of the Precinct's water supply is connected to the HPZ (Wells 3, 4, 5, & 6); 13.6% of the Precinct's water supply is connected to the LPZ (Well 2R). Meanwhile, 60% of water usage in the Precinct occurs from the LPZ. Currently only a single 12" pipe connects the HPZ to the LPZ. That pipe crosses Kearsarge Brook above an historic stone-arch culvert and could be susceptible to damage from severe weather flooding events. The Precinct has previously recognized the need to provide a redundant connection between the HPZ and LPZ and taken some steps toward establishing that connection by installing large water main in the vicinity of Cranmore to the north and Artist Falls Road to the south.

Project Details:

A redundant cross-country pipeline would be installed from the intersection of Old Bartlett Road and Skimobile Road to the north, and Artist Falls Road to the south. The water main

would be located in an easement generally along the existing electricity transmission line corridor. This redundant line provides protection to the LPZ should the single existing connection be damaged for any reason.

Project Phases:

Phase I – Planning & Preliminary Engineering:
Currently underway, the Precinct has retained Wright-Pierce and HEB Engineers to survey the proposed route of the redundant pipeline, lay out a potential easement, and prepare a preliminary design. Upon completion of the planning phase the Precinct will have easements ready to go, 60% design drawings, and a construction cost estimate. Phase I cost: $47,000.

Phase II – Final Design & Permitting:
The Precinct will continue to work with Wright-Pierce and HEB to finalize any easement acquisition, obtain project permits, and complete project design. Phase II Cost: $60,000

Phase III – Construction
Final design documents will be put out to bid for construction. Phase III Cost: $1,218,000

Project Funding

Estimated Project Cost: $1,278,000
This project may qualify for DWSRF funding through the State. If it does, the Precinct may receive up to 50% grant and principal forgiveness, plus additional grant toward the planning portion already paid for. If it does not, we anticipate applying to the Drinking Water Groundwater Trust Fund and other entities with the goal of receiving 25% or more grant funding. If DWGTF funding is received, estimated net cost to the Precinct is $960,000.

Estimated Financial Impact

Projects of this kind have historically been tax-funded. Assuming DWGTF (worst-case scenario) 20-year note at 2.5% and based on current (2021) valuations, after receiving grant funds the net tax impact is projected to be around $0.09.

Recommendation

The Precinct should move forward with this project and approve borrowing on the 2022 Warrant. This project has been identified as a critical need for redundancy and resiliency of the Precinct's water distribution system.

Article 13: Water Energy Efficiency Upgrades

Project Background:

The 2018 Energy Audit through NHDES identified several improvements that could be made to reduce energy costs. Among those recommendations were the addition of heat pump units at each of the well buildings to reduce electricity consumption during the day, when

electricity rates are highest (the Precinct has special "time of day" rates at its older well buildings with reduced electricity rates at night).

Project Details:

This project would design and install heat pumps at each well building, including Well 4/5 Control Building; Well 3 bunker; Well 6 building; Well 3/6 Control Building; Kearsarge Estates Booster Station; and the Well 2R Control Building. In addition, a rooftop solar array would be designed and constructed for the Well 2R Control Building (NH Electric Co-op no longer offers time-of-day rates for new facilities) to reduce electricity cost.

Project Phases:

Phase I – Heat Pump Design/Install
An RFP would be put out to design and install heat pumps at the well buildings above.
Estimated cost of Phase I ~ $66,000

Phase II – Design and Construction of Well 2R Control Building
An RFP would be put out to design and install a solar array at the Well 2R Control Building.
Estimated cost of Phase II ~ $60,000

Project Funding

Total Project Cost is $126,000.
The Precinct has applied to the NHDES Sustainability Grant Program (essentially an expansion of the old Asset Management Grant Program) for these projects. If selected, the Precinct will receive 50% grant toward implementation. The remaining funds are to be allocated from the operating budget (Heat pumps) and Green Energy Capital Reserve (Solar) – currently shown in operating budget.

Estimated Financial Impact

This project would be funded in the operating budget and capital reserve funds. No tax impact or water rate increase is expected.

Recommendation

The Precinct should move forward with this project and approve receipt of Sustainability Grant Funds on the 2022 warrant. These projects will return electricity savings that will help keep rates lower in the future.

Article 14: Water Asset Management Project

Project Background:

The Precinct has historically taken advantage financial incentives from the State to develop its asset management program. For 2022, the State has significantly expanded its Asset Management Grant offerings under the new name "Sustainability Grant Program". The Precinct has applied for three total Sustainability Grants, including the previously described

"Water Building Energy Efficiency Upgrades". The additional two projects listed here are eligible for 100% State funding and have therefore been separated from the energy efficiency project for clarity.

Project Details:

The Precinct has applied for a full water audit and continuation of its existing asset management efforts.

Project Phases:

Water Audit

The Precinct will receive a full water audit from a consultant selected by NHDES. The audit will account for all water produced, sold, and unaccounted for. Recommendations will be provided to the Precinct on how to reduce unaccounted for water. Cost of Water Audit Phase is $20,000.

Asset Management

Data Collection: To continue previous asset management work the Precinct will collect data on vertical assets (like pump stations) including condition assessments and risk assessments.
CMMS Purchase & Installation: The Precinct will select, purchase, and begin implementation of a CMMS (Computerized Maintenance Management Software) platform. The goal is to find a single solution that will work across water and wastewater operations to track asset condition, maintenance, work orders, inventory, and capital planning. Precinct staff has already been demoing software platforms.
Cost of Service Review: It has been many years since the Precinct has reviewed its rate structure, especially with respect to buy-in fees. Given the recent investments in water infrastructure including Well 2R, the Well 3/6 Control Building, and other pending projects, it is important that these costs are accounted for as new development comes online.
Update of Capital Improvements Program (CIP): The Precinct has completed much of its original master plan projects. This task will look at existing trends and update future needs.
High-Pressure Zone Evaluation: If there are funds remaining, the Precinct will look at improvements that may be made to the High-Pressure-Zone to serve customers more appropriately at both higher and lower elevations.

Cost of Asset Management Phase is $100,000.

Project Funding

Estimated Project Cost is $120,000. The entire amount will be reimbursable through the Sustainability Grant Program.

Estimated Financial Impact

This project would be user fee funded – 100% reimbursement is expected from the State.

Recommendation

The Precinct should move forward with this project and approve receipt of Sustainability Grant Funds on the 2022 warrant. These projects will return long term value at no net cost to the Precinct.

Article 15: Barnes Road Water Main Replacement

Project Background:

2022 will see construction begin on the proposed Market Basked project. As part of that project, the developer will be moving MacMillan Lane and associated water main, as well as installing new 8" ductile iron pipe from the former Barnes Road / MacMillan Lane intersection to the east, connecting back into Common Court east of the new Market Basket building. Currently, there is a section of old 6" cast iron pipe between Route 16 and the Barnes Road / MacMillan Lane intersection. Following Market Basket work, the Town plans to overlay the entirety of Barnes Road. It makes sense for the Precinct to replace the old cast iron pipe before the Town repaves Barnes Road.

Project Details:

The section of old 6" cast iron pipe between Route 16 and the Barnes Road / MacMillan Lane intersection will be replaced with new 8" ductile iron pipe.

Project Phases:

Work will occur in a single construction phase.

Project Funding

Project Cost is $96,000 based on pre-purchased pipe and bid pricing received for pipe installation.

Estimated Financial Impact

This project will be funded entirely from water capital reserve funds.

Recommendation

Given the coming work and Town paving schedule, the Precinct should move forward with this project in 2022.

Article 17: HVAC Building Modifications

Project Background:

The HVAC system for the Administration Building of the WWTF is approaching 25 years old. When originally constructed, the HVAC equipment was placed within the attic before the roofing structure was installed around it. As a result, access to the HVAC system is limited and replacement of aging parts requires partial removal of the WWTF roof. The heat exchanger coils have experienced multiple leaks in recent years and are in need of replacement.

Project Details:

To facilitate replacement of the failing heat exchangers, a section of the roof will be removed and attic space will be expanded. This will provide working room needed for repair of existing equipment and space for future replacement of the entire HVAC system when it reaches the end of its useful life.

Project Phases:

Work will occur in a single construction phase.

Project Funding

Project Cost is $140,000 based on estimates provided by Bergeron Technical Services.

Estimated Financial Impact

This project will be funded from Conway Village Fire District interconnect funds as well as a proportional share funded directly by CVFD per the Inter-Municipal Agreement.

Recommendation

Given the recent failures of existing heat exchanger equipment and need for replacement, it is recommended that this project move forward immediately.

Article 20: Pine Hill Franchise Area

Project Background:

A developer is purchasing and developing land on either side of Eagles Way and has requested water and sewer service from the Precinct. A portion of this development will be outside of the Precinct boundaries. Opening the Precinct Charter to expand boundaries is not recommended and so applying for a Franchise Area from NH PUC is the alternative option.

Project Details:

The Precinct will apply to NH PUC for a franchise area consisting solely of the lots within the proposed Pine Hill development to be served by water and sewer. Since we will charge these customers the same rate as customers within Precinct bounds, the Precinct will not be subject to PUC regulation.

Project Funding

There will be some cost to the Precinct for legal work to secure the Franchise area, however, those costs are unknown at this time.

Estimated Financial Impact

The Franchise Area application work will be funded from the water and sewer operating budgets initially. The developer will be requested to reimburse the Precinct for the actual cost of securing the Franchise Area.

Recommendation

This development provides additional water & sewer revenue to the Precinct, as well as adding to the Precinct's tax base. It is recommended that the application for this Franchise Area be approved.