



TECHNICAL MEMORANDUM

To: Dawn Grantham, Crestline Sanitation District
Author(s): Phil Giori, PE (Dudek)
Date: 1/23/2024
Subject: Master Plan and CIP Update

1 Introduction

The District previously contracted with Dudek to prepare a comprehensive Master Plan Update in 2018, which assessed District facilities, capacity, and provided recommendations for capital improvement projects, schedules, and cost estimates to guide the next 7 years of infrastructure improvement needs. Since 2018, the District has completed or is in the process of completing several projects, including an \$11M upgrade to the Huston Creek WWTP which will include a new primary clarifier, sludge handling and dewatering facilities, trickling filter recirculation pump replacement, and upgrades to the existing electrical service and provision of backup power for the facility.

These improvement needs were identified in the 2018 Master Plan as a top priority, and now that they are near completion, the District is in need of updating the CIP projects, schedules, and cost estimates to better reflect current engineering and construction costs, which have escalated due to inflation and supply chain constraints since 2020. The facilities assessment component of the previous master plan is not updated in this Master Plan and CIP update, as much of the evaluation is still relevant and does not require comprehensive update for another 5-10 years. Ultimately, the Master Plan Update is intended to inform and guide future rate studies and evaluate the potential need and extent of rate increases that may be required for the District to support their Capital Improvement Program and continue to provide high quality services for their customers and community.

1.1 Objectives

This Master Plan and Capital Improvement Plan update identifies, prioritizes, and budgets recommended capital improvement projects for the District. The CIP establishes immediate to long-term recommended projects and planning budgets for the District and includes an annual escalation of project costs to account for cost increases in professional services and construction due to inflation. The development of the CIP project recommendations is based on the analysis completed for the 2018 Master plan, with updates founded on input from District staff regarding changes in observed condition, process performance, and risk and reliability. Updates include new projects, updates to the priority and scheduling of previously identified projects, scope, and cost updates. The new CIP recommendations serve to aid the District in completing a new rate study to maintain funding requirements for infrastructure improvements.

1.2 Methodology

Through multiple workshops with the District, new projects were identified for inclusion in the District's CIP while existing project scopes were confirmed, modified, and/or updated to reflect current facilities needs and new developments.

Budgetary Cost Estimating

A budgetary cost is estimated for each defined project. The cost estimates are based on anticipated construction cost values with a contingency and "soft cost" (e.g. planning, design, administrative) multipliers added to define a total "project cost".

Estimates of probable construction costs include consideration of:

- Vendor quotes and published catalog costs for major equipment and mechanical components. Material and equipment quotes. Multipliers for delivery, in-field services, installation, tools, parts, labor, and contractor overhead and profit are applied to derive an installed unit cost.
- Parametric unit cost values derived from recent similar projects for demolition, piping, civil work, and electrical work. Scaling factors are applied to adjust for size and complexity.
- Unit cost factors developed for specific components of the project, as applicable.
- Annual escalation rate to account for inflation is included on all projects at an assumed rate of 3% per year.
- Project costs developed in 2018 with the previous Master Plan are updated using the Engineering News Record's (ENR) Construction Cost Index (CCI) (see section 1.1.2) for scope elements of the project that remain unchanged.

Cost Indices

In developing project cost estimates, it is common to use historical data from similar projects, (e.g. detailed cost estimates, bids from constructed projects). To be relevant to the immediate project, the date and geographical region of the cost data must be considered. The industry standard barometer of changes in construction market conditions over time is the Engineering News Record's (ENR) Construction Cost Index (CCI). This index is computed from constant quantities of structural steel (weighted 15%), Portland cement (2%), lumber (10%), and common labor (73%) in 20 cities, the average of which is considered to be the national average and based on a value of 100 in 1913 (Sanks, 852). Similarly, the CCI is regionalized using the Los Angeles ENR-CCI index. Construction estimates are normalized in time by proportioning values to the index existing at the time of the estimate or bid. Where applicable, the cost estimates for the recommended projects in this CIP are normalized to the Los Angeles ENR-CCI for September 2023 of 15,157.5 to represent present dollars.

Contingency

Project contingencies are applied to cover uncertainties in the estimating practice including unknown or unforeseen costs. Industry standard contingencies can range from 10% to 35%, depending on the confidence level of the estimate (i.e., project stage, risk, scope development, engineering constraints, etc.). Unless noted otherwise, a 35% contingency is added to the estimated project costs herein.

Implementation Costs

Implementation cost allowances (a.k.a. “soft costs”) are included in the project estimates for costs directly associated with delivering a project from planning through construction that are not included in the construction estimate (i.e. planning, design, permitting, construction management/inspection, project administration, and commissioning and closeout). Projects with lower construction costs tend to have a larger percentage of project delivery (soft) costs, while the larger projects tend to have a smaller percentage of soft costs. This is primarily due to the economy of scale associated with projects.

Table 1.1 presents the project implementation allowances (soft cost) classification system utilized in the CIP recommendations. Each project is assigned a “Soft Cost Class” of A, B, C, or D, depending on the project size and complexity. Projects that do not fit into one of these four classifications are listed as “Project Specific”, and soft costs are assigned based on recent similar projects and experience.

Table 1.1 Summary of Soft Cost Classification System

Soft Cost Class	Category	% of Construction Cost	Comments
A	Engineering	8%	Projects that are relatively simple (e.g. long pipelines, large pond liners, large (+\$300k) equipment replacement) and/or larger (e.g. full treatment plant design), possibly with repetitive aspects.
	CM & ESDC	15%	
	Administration	2%	
	Total Soft Costs	25%	
B	Engineering	10%	Projects of average size and/or complexity (e.g. new pump stations, sand filters redesign, equipment replacement)
	CM & ESDC	18%	
	Administration	3%	
	Total Soft Costs	31%	
C	Engineering	15%	Complex and/or small projects (e.g. electrical upgrades, SCADA upgrades, small pump station replacement/rehab)
	CM & ESDC	20%	
	Administration	5%	
	Total Soft Costs	40%	
D	Engineering	5%	District replaced/installed equipment (e.g. small pump replacement, instrument replacement projects) that do not require engineering design.
	CM & ESDC	5%	
	Administration	5%	
	Total Soft Costs	15%	

Engineering = Study, Preliminary, and Final Design
CM = Construction Management (Contract management and inspection)
ESDC = Engineering Services During Construction
Administration = District administrative and legal costs

Prioritization

CIP project recommendations are grouped into three categories: immediate works (recommend initiating project within 0-2 years), mid-term (recommend initiating project within 2-6 years), and long-term (recommend initiating

project in 7+ years). Priorities are assigned to projects based on workshops held with District staff to discuss the needs and urgency associated with each project.

2 CIP Recommendations

The following section describes recommended capital improvement projects to be included in the District's 10-year CIP. New recommended CIP projects are identified to address the reliability, performance, and capacity deficiencies identified through workshops with key District staff. Certain projects maintained from the 2018 Master Plan and CIP are re-prioritized as required to represent current priorities and needs. Each CIP project should be evaluated relative to the most current data and information available prior to implementation to verify if the project is the best solution for the District at that time, or if the scope should be adjusted.

2.1 Ongoing / Completed Projects

Since the 2018 Master Plan, the District has either completed or are actively completing the following projects identified in the 2018 Master Plan:

- Huston Creek WWTP Primary Clarifier Replacement
- Huston Creek WWTP Biosolids Dewatering Upgrade
- Huston Creek WWTP Emergency Generator
- Collection System Inflow and Infiltration Analysis (Flow Metering)
- Seeley Creek WWTP Emergency Storage Pond (Design only)

2.2 CIP Overview

The District's wastewater system is categorized into the following facilities:

- Collection System
- Huston Creek WWTP
- Seeley Creek WWTP
- Cleghorn WWTP

The Cleghorn WWTP is broken out separately from the other District facilities due to its unique funding arrangement. The District operates and maintains the plant for California State Parks and therefore, improvements to the Cleghorn WWTP are funded by the State and not District ratepayers.

A summary CIP table with each recommended project and implementation schedule is shown in Figure 1. Project summary sheets are included in Section 3 and include relevant details and cost breakdown for each project.

Figure 1. CIP Summary Table

Project No.	Project Name	Priority	CIP Budget for Fiscal Year Ending In											Total				
			2025	2026	2027	2028	2029	2030	2031	2032	2033	2034+						
HC-1	Huston Creek WWTP Retaining Wall	Immediate Works (0-2 Years)	\$ 531,000														\$ 531,000	
CS-1	Collection System Flow Data Analysis and Hydraulic Model Updates	Immediate Works (0-2 Years)	\$ 135,000															\$ 135,000
SC-1	Seelye Creek WWTP Access Road Assessment	Immediate Works (0-2 Years)	\$ 95,000															\$ 95,000
SC-2	Seelye Creek WWTP Primary Clarifier Condition Assessment	Immediate Works (0-2 Years)	\$ 142,000															\$ 142,000
HC-3	Houston Creek WWTP Ongoing Facility Safety Upgrades	Immediate Works (0-2 Years)	\$ 60,000	\$ 346,000														\$ 406,000
HC-4	Houston Creek WWTP Access Road Replacement	Immediate Works (0-2 Years)	\$ 365,000	\$ 2,131,000														\$ 2,496,000
SC-7	Seelye Creek Primary Clarifier Upgrade	Immediate Works (0-2 Years)		\$ 150,000	\$ 870,000													\$ 1,020,000
SC-3	Seelye Creek WWTP Primary ODS Electrical Upgrade	Immediate Works (0-2 Years)		\$ 39,000	\$ 228,000													\$ 267,000
LS-1	Lake Gregory Wet Well Capacity Upgrade	Mid-Term (2-6 Years)		\$ 118,000	\$ 690,000													\$ 808,000
SC-5	Seelye Creek WWTP Access Road Replacement	Mid-Term (2-6 Years)		\$ 684,000	\$ 3,993,000													\$ 4,677,000
SC-4	Seelye Creek WWTP Well Construction	Mid-Term (2-6 Years)		\$ 89,000	\$ 516,000													\$ 605,000
SC-6	Seelye Creek WWTP Ancillary Systems Upgrade	Mid-Term (2-6 Years)		\$ 102,000	\$ 594,000													\$ 696,000
HC-2	Nutrient Management Study	Mid-Term (2-6 Years)		\$ 304,000														\$ 304,000
HC-5	Huston Creek Primary Clarifiers Structural Assessment	Mid-Term (2-6 Years)		\$ 228,000														\$ 228,000
HC-6	Huston Creek Primary Clarifier Replacement	Long-Term (7+ Years)																\$ 7,567,000
District Total			\$ 1,328,000	\$ 2,666,000	\$ 1,900,000	\$ 4,874,000	\$ 1,642,000	\$ 1,642,000	\$ 1,554,000	\$ 1,601,000	\$ 1,649,000	\$ 1,698,000	\$ 1,698,000	\$ 1,698,000	\$ 1,698,000	\$ 1,698,000	\$ 19,977,000	
Cleghom WWTP Project Recommendations (State Funded)																		
CL-1	Cleghom WWTP Concrete Structures Rehabilitation	Immediate Works (0-2 Years)	\$ 323,000															\$ 323,000
CL-2	Cleghom WWTP Sludge Wasting and Clarifier Upgrades	Mid-Term (2-6 Years)		\$ 34,000	\$ 195,000													\$ 229,000
CL-3	Cleghom WWTP Oxidation Ditch Upgrade	Mid-Term (2-6 Years)		\$ 144,000	\$ 839,000													\$ 983,000
CL-4	Cleghom WWTP Headworks Upgrade	Mid-Term (2-6 Years)			\$ 444,000	\$ 2,592,000												\$ 3,036,000
CL-5	Cleghom WWTP On-Site Generation System Upgrade	Long-Term (7+ Years)																\$ 149,000
Cleghom Total (State Funded)			\$ 323,000	\$ -	\$ 34,000	\$ 330,000	\$ 1,283,000	\$ 2,592,000	\$ -	\$ 22,000	\$ 127,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4,720,000	
Combined Total (State & District Funded)			\$ 1,651,000	\$ 2,666,000	\$ 1,934,000	\$ 5,213,000	\$ 2,925,000	\$ 3,657,000	\$ 1,554,000	\$ 1,623,000	\$ 1,776,000	\$ 1,698,000	\$ 1,698,000	\$ 1,698,000	\$ 1,698,000	\$ 1,698,000	\$ 24,697,000	

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Based on the recommended CIP, the District requires approximately \$25 million over the next 10 years for infrastructure improvements, distributed between 20 planned projects. The largest proportion of infrastructure improvements are anticipated to be for the Huston Creek and Seeley Creek WWTPs, which are the largest District facilities. Nine new projects have been identified since the 2018 Master Plan, of which six have been prioritized as Immediate Works (0-2 years) and require near-term attention. In total, nine of the planned projects are recommended to be initiated within the next two years, the majority of which are located within Huston Creek WWTP and Seeley Creek WWTP. This may present a challenge for staff to administrate and manage this many projects in a short period of time, therefore, the District may consider consolidating multiple projects that involve similar professional services expertise to reduce administrative burdens and consolidate the number of consultants and contractors required for project implementation.

2.1 Deferred Projects

Of the remaining projects from the 2018 Master plan, one project was specifically re-prioritized and deferred to a lower priority to allow for new, higher priority projects to be implemented first. The project that has been re-prioritized and deferred to future years is:

- **HC-6: Huston Creek WWTP Primary Clarifier Replacement.** This project is intended to replace the two existing primary clarifiers after the new primary clarifier is put online. Based on discussions with the District, this project can be deferred with maintenance to the existing equipment to allow for higher priority projects to be implemented first.

2.1 Aborted Projects

Two projects from the 2018 Master plan have been removed from the recommended 10-year CIP due to regulatory uncertainty. The projects that have been removed from the recommended CIP and may be re-considered at a later date include:

- **HC-7: Huston Creek WWTP Biological Treatment Upgrade:** This project is intended to upgrade the Huston Creek WWTP biological treatment process to comply with anticipated future regulatory updates, specifically for nutrient removal. Currently, there is not a known timeline for regulatory changes. A nutrient management study (HC-2) is recommended to evaluate options in anticipation of future regulatory changes, however, these changes are not anticipated to be enacted within the 10-year CIP timeframe.
- **SC-8: Seeley Creek WWTP Emergency Storage Pond:** The design for this project was previously completed, however, the District has not received approval from the Regional Board and the US Forest Service to complete this project. The project can be implemented if approval is obtained. At this time, it is uncertain if the project will ever be approved for implementation.

2.2 New Projects

Since the 2018 Master Plan, new projects have been identified during workshops with key District staff and added to the CIP based on recent developments and infrastructure needs. Each of the new projects identified which were not previously included in the 2018 Master Plan are outlined below, including a description of the project drivers and project priority.

2.2.1 HC-1: Huston Creek Retaining Wall

The retaining wall extending from the secondary sludge pump room north toward the emergency storage tank is observed to be in poor condition and failing. Continued failure and erosion of the retaining wall due to storm events could undermine the access road and potentially the secondary sludge pump room itself. These failures could have major consequences to maintaining treatment and access to this area of the plant, and therefore needs to be addressed as a top priority project.

2.2.2 CS-1: Collection System Flow Data Analysis and Hydraulic Model Updates

The District has captured years of flow data from the collection system after installing flow meters in their system to monitor inflow and infiltration. However, the data has not yet been analyzed to determine the extent of I/I and whether or not the District's ongoing CIPP rehabilitation projects have had a meaningful impact on I/I reduction in the collection system. In addition to needing to analyze the recent 5 years' worth of flow data, the District needs to update the hydraulic model created with the 2018 Master Plan, evaluate the I/I reduction progress and assess where additional pipe rehabilitation is needed to reduce I/I to acceptable levels. I/I reduction is a continued high priority objective for the District, and therefore, updating the District's flow data analysis and locating areas where I/I is still an issue will allow the District to better focus investment in sliplining and achieve their I/I reduction goals.

2.2.3 SC-1: Seeley Creek WWTP Access Road Assessment

During the 2022 winter storms, Crestline experienced heavy rain and snow, the likes of which it hasn't seen in many years. The erosion caused by the storms are believed to have undermined and damaged areas of the access road infrastructure. Repairing and replacing the damaged access road is a high priority for the District since it is the only entrance and egress available to the plant. The assessment project would provide a detailed assessment of damages and improvements needed for the road and develop a plan for the repairs. Final design and construction of improvements would be completed as a second project.

2.2.4 HC-4: Huston Creek WWTP Access Road Replacement

Like Seeley Creek WWTP, the access road at Huston Creek WWTP was also damaged during the winter 2022 storms and had additional wear and tear from heavy construction equipment accessing the site for the ongoing Dewatering Building and Primary Clarifier project. After completion of the project, the access road will need to be repaired and repaved. This project is a high priority and is recommended for FY25.

2.2.5 SC-7: Seeley Creek WWTP Primary Clarifier Upgrade

The District has identified erosion and concerning soil conditions on the north side of the Seeley Creek WWTP Primary Clarifier. Recently, the primary clarifier skimmer arm has misaligned or become crooked and needs to be repaired. Staff are concerned this may have something to do with erosion undermining the structure. The structure should be inspected to determine if any differential settlement has occurred due to the erosion of the slope on the side of the clarifier. Due to the nature of the concerns, this is a high priority project that is recommended for investigation in FY25 and improvements, if necessary, in FY26.

2.2.6 SC-5: Seeley Creek WWTP Access Road Replacement

Following the Access Road assessment project, it is recommended to design and construct necessary improvements to the Seeley Creek WWTP Access Road as a high priority project. For planning purposes, this project is recommended for FY26.

2.2.7 HC-2: Nutrient Removal Study

The WWTPs currently do not have a nitrogen discharge limit in their Waste Discharge Requirements permit with the Regional Water Quality Control Board (RWQCB). However, it is expected that when Crestline's permit is eventually renewed, the RWQCB is likely to impose a 10 mg/L total nitrogen discharge limit for the District's effluent, similar to other local agencies such as Lake Arrowhead CSD. It is recommended that the District begin to study nutrient management alternatives, including the feasibility of performing nitrogen removal at each of their WWTPs or at a centralized location at Las Flores Ranch. Upon completion of the study, it is recommended that the District share the results and conclusions with the RWQCB, and proactively implement nutrient reduction measures, to the extent practical, ahead of future regulatory changes. This project is a medium priority project recommended for FY29.

2.2.8 HC-5: Huston Creek WWTP Primary Clarifiers Structural Assessment

The existing Huston Creek WWTP primary clarifiers were constructed in 1950. The existing clarifiers are at risk of failure from structural and geotechnical conditions, as the structures are over 70 years old and were constructed with thin (4") walls and a single layer of reinforcement. With the new primary clarifier in service, the existing clarifiers can be shut down and dewatered to perform a structural inspection and assessment to determine the feasibility of rehabilitation of the clarifiers or if full replacement is needed. This project is a medium priority project recommended for FY28.

2.2.9 HC-6: Huston Creek WWTP Primary Clarifiers Replacement

Depending on the outcomes and recommendations of the structural assessment project HC-5, section 2.2.8, the clarifiers will either need to be rehabilitated or be fully replaced. For the purposes of CIP planning, HC-6 was budgeted assuming full replacement of the two existing primary clarifiers due to their age and structural design. This project is a low priority project recommended for FY30 but is dependent on the outcome of HC-5.

3 Individual CIP Summary Sheets

Individual summary sheets of each project recommended in the District's 10-year CIP are included in the following pages. Refer to Figure 1 for the overall summary table and recommended scheduling for each project.

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Project No.	HC-1		
Project Name	Huston Creek WWTP Retaining Wall		
Description	The retaining wall extending from the secondary sludge pump room north toward the emergency storage tank is observed to be in poor condition and failing. Continued failure and erosion of the retaining wall due to storm events could undermine the access road and potentially the secondary sludge pump room itself. These failures could have major consequences to maintaining treatment and access to this area of the plant, and therefore, needs to be addressed as a top priority project.		
Priority	Immediate Works (0-2 Years)		
Project Need			
Reliability	<input checked="" type="checkbox"/>	Process Performance	<input type="checkbox"/>
Capacity	<input type="checkbox"/>	Regulatory	<input type="checkbox"/>
District Policy & Goals	<input type="checkbox"/>		
Project Cost			
Construction Cost			
Estimated Construction Cost		\$	300,000
Soft Costs			
<i>Classification 'B'</i>			
Engineering & Permitting	10% of construction cost	\$	30,000
CM & ESDC	18% of construction cost	\$	54,000
Administration	3% of construction cost	\$	9,000
Soft Cost Subtotal		\$	93,000
Contingency			
Contingency	35% of project cost	\$	138,000
Total Project Cost		\$	531,000

Project No.	CS-1		
Project Name	Collection System Flow Data Analysis and Hydraulic Model Updates		
Description	<p>The District has captured years of flow data from the collection system after installing flow meters in their system to monitor inflow and infiltration. This data has not yet been analyzed to determine the extent of I/I and whether or not the District's ongoing CIPP rehabilitation projects have been meaningfully reducing I/I in the collection system. The District needs an engineering firm to analyze the recent 5 years worth of flow data and update the hydraulic model created with the 2018 Master Plan and prepare a report on I/I reduction progress as well as where additional pipe rehabilitation is needed to reduce I/I to acceptable levels.</p> <p><u>Recommended Project:</u> Perform an engineering study including collection system flow data analysis, a sewer hydraulic model update, and provide recommendations for collection system areas which the District should focus on for annual CCTV inspections and CIPP rehabilitation projects.</p>		
Priority	Immediate Works (0-2 Years)		
Project Need			
Reliability	<input checked="" type="checkbox"/>	Process Performance	<input checked="" type="checkbox"/>
Capacity	<input checked="" type="checkbox"/>	Regulatory	<input checked="" type="checkbox"/>
District Policy & Goals	<input checked="" type="checkbox"/>		
Project Cost			
Construction Cost			
Estimated Construction Cost	N/A		
Soft Costs			
<i>Project Specific</i>			
Engineering & Permitting		\$	100,000
CM & ESDC		N/A	
Administration		N/A	
Soft Cost Subtotal		\$	100,000
Contingency			
Contingency	35% of engineering cost	\$	35,000
Total Project Cost		\$	135,000

Project No.	SC-1		
Project Name	Seeley Creek WWTP Access Road Assessment		
Description	<p>Staff have expressed concerns regarding the condition of the access road to the Seeley Creek WWTP. Previous large storms have affected the access road and an assessment is required to understand potential damages or areas of roadway that need to be repaired for safe vehicle access.</p> <p><u>Recommended Project:</u> Perform a roadway assessment to identify areas of repair needs and define a preliminary scope of work for roadway improvements.</p>		
Priority	Immediate Works (0-2 Years)		
Project Need			
Reliability	<input checked="" type="checkbox"/>	Process Performance	<input type="checkbox"/>
Capacity	<input type="checkbox"/>	Regulatory	<input type="checkbox"/>
District Policy & Goals	<input type="checkbox"/>		
Project Cost			
Construction Cost			
Estimated Construction Cost			N/A
Soft Costs			
<i>Project Specific</i>			
Engineering & Permitting		\$	70,000
CM & ESDC		N/A	
Administration		N/A	
Soft Cost Subtotal		\$	70,000
Contingency			
Contingency	35% of engineering cost	\$	25,000
Total Project Cost		\$	95,000

Project No.	HC-2		
Project Name	Nutrient Management Study		
Description	<p>None of the Crestline WWTP's currently have a nitrogen discharge limit in their Waste Discharge Requirements permit with the Regional Water Quality Control Board (RWQCB). However, it is expected that when Crestline's permit is eventually renewed, the RWQCB will impose a 10 mg/L total nitrogen discharge limit for the District's effluent, similar to other local agencies such as Lake Arrowhead CSD. It is recommended that the District begin to study nutrient management alternatives, including the feasibility of performing nitrogen removal at each of their WWTP's or at a centralized location at Las Flores Ranch. The goal of the study is to identify a cost-effective approach to managing nutrient removal requirements expected with the future permit update. Upon completion of the study, it is recommended that the District share the results and plan with the RWQCB and work toward proactively implementing nutrient reduction measures ahead of future regulatory changes.</p> <p><u>Recommended Project:</u> Prepare a Nutrient Management Study</p>		
Priority	Mid-Term (2-6 Years)		
Project Need			
Reliability	<input type="checkbox"/>	Process Performance	<input type="checkbox"/>
Capacity	<input type="checkbox"/>	Regulatory	<input checked="" type="checkbox"/>
District Policy & Goals	<input checked="" type="checkbox"/>		
Project Cost			
Construction Cost			
Estimated Construction Cost	N/A		
Soft Costs			
<i>Project Specific</i>			
Engineering & Permitting		\$	225,000
CM & ESDC		N/A	
Administration		N/A	
Soft Cost Subtotal		\$	225,000
Contingency			
Contingency	35% of engineering cost	\$	79,000
Total Project Cost		\$	304,000

Project No.	SC-2		
Project Name	Seeley Creek WWTP Primary Clarifier Condition Assessment		
Description	<p>The District has identified erosion and concerning soils conditions on the north side of the Seeley Creek WWTP Primary Clarifier. Recently, the primary clarifier skimmer arm has gotten out of alignment and needs to be repaired. The structure should be inspected to determine if any differential settlement has occurred due to the erosion of the slope on the side of the clarifier.</p> <p><u>Recommended Project:</u> Perform a structural assessment and erosion control study for the Seeley Creek WWTP primary clarifier. The study should recommend erosion control measures and/or structural improvements that may be necessary to protect the structure.</p>		
Priority	Immediate Works (0-2 Years)		
Project Need			
Reliability	<input checked="" type="checkbox"/>	Process Performance	<input type="checkbox"/>
Capacity	<input type="checkbox"/>	Regulatory	<input type="checkbox"/>
District Policy & Goals	<input type="checkbox"/>		
Project Cost			
Construction Cost			
Estimated Construction Cost			N/A
Soft Costs			
<i>Classification 'C'</i>			
Engineering & Permitting		\$	105,000
CM & ESDC		N/A	
Administration		N/A	
Soft Cost Subtotal		\$	105,000
Contingency			
Contingency	35% of engineering cost	\$	37,000
Total Project Cost		\$	142,000

Project No.	HC-3		
Project Name	Houston Creek WWTP Ongoing Facility Safety Upgrades		
Description	<p>Several failure modes at Houston Creek WWTP pose a safety risk to plant operations and maintenance staff. Structural failure of interior CMU walls in the chlorine contact basin, structural failure of the secondary effluent box, and grating failure in the headworks need to be addressed. Staff has stated that there are ongoing projects to address these failure modes. The ongoing project has the following general scope:</p> <p><u>Project:</u> Repair damaged concrete and corrosion on secondary effluent box. Patch structural failure of CMU interior walls of chlorine contact basin with concrete mortar or cedar wood or replace interior walls with new concrete. Repair damaged grating supports and rehabilitate concrete in influent channels or replace influent channel grating all-together, depending on condition.</p>		
Priority	Immediate Works (0-2 Years)		
Project Need			
Reliability	<input checked="" type="checkbox"/>	Process Performance	<input type="checkbox"/>
Capacity	<input type="checkbox"/>	Regulatory	<input type="checkbox"/>
District Policy & Goals	<input checked="" type="checkbox"/>		
Project Cost			
Construction Cost			
Estimated Construction Cost		\$	215,000
Soft Costs			
<i>Classification 'C'</i>			
Engineering & Permitting	15% of construction cost	\$	32,000
CM & ESDC	20% of construction cost	\$	43,000
Administration	5% of construction cost	\$	11,000
Soft Cost Subtotal		\$	86,000
Contingency			
Contingency	35% of project cost	\$	105,000
Total Project Cost		\$	406,000

Project No.	HC-4		
Project Name	Houston Creek WWTP Access Road Replacement		
Description	<p>The Huston Creek WWTP Access Road is in poor condition following the construction of the new dewatering building and primary clarifier. The access road needs to be re-graded and paved to provide safe vehicle access to the WWTP.</p> <p><u>Recommended Project:</u> Perform area-specific road improvements where slope stability and/or drainage is a concern. Provide new paving and guardrails as needed to restore safe access road conditions. Access road is approximately 3,600 feet and assumed 12' wide lane.</p>		
Priority	Immediate Works (0-2 Years)		
Project Need			
Reliability	<input checked="" type="checkbox"/>	Process Performance	<input type="checkbox"/>
Capacity	<input type="checkbox"/>	Regulatory	<input type="checkbox"/>
District Policy & Goals	<input type="checkbox"/>		
Project Cost			
Construction Cost			
Estimated Construction Cost		\$	1,411,000
Soft Costs			
<i>Classification 'B'</i>			
Engineering & Permitting	10% of construction cost	\$	141,000
CM & ESDC	18% of construction cost	\$	254,000
Administration	3% of construction cost	\$	42,000
Soft Cost Subtotal		\$	437,000
Contingency			
Contingency	35% of project cost	\$	647,000
Total Project Cost		\$	2,496,000

Project No.	SC-3		
Project Name	Seeley Creek WWTP Primary ODS Electrical Upgrade		
Description	An old but reliable single-duty ODS-style primary sludge pump sends primary sludge to the old holding tank. Conduit has failed, causing failure when water from lawn infiltrates into the panel. <u>Recommended Project:</u> Replace panel and conduit.		
Priority	Immediate Works (0-2 Years)		
Project Need			
Reliability	<input checked="" type="checkbox"/>	Process Performance	<input checked="" type="checkbox"/>
Capacity	<input type="checkbox"/>	Regulatory	<input type="checkbox"/>
District Policy & Goals	<input type="checkbox"/>		
Project Cost			
Construction Cost			
Estimated Construction Cost		\$	141,000
Soft Costs			
<i>Classification 'C'</i>			
Engineering & Permitting	15% of construction cost	\$	21,000
CM & ESDC	20% of construction cost	\$	28,000
Administration	5% of construction cost	\$	7,000
Soft Cost Subtotal		\$	56,000
Contingency			
Contingency	35% of project cost	\$	69,000
Total Project Cost		\$	266,000

Project No.	SC-4		
Project Name	Seeley Creek WWTP Well Construction		
Description	<p>Chlorinated secondary effluent first goes through a wye-strainer, then through cartridge filter, media filter, water softener, carbon filter, UV, RO, then into the on-site chlorine generation skid as supply water. The skid consists of one Micro-Chlor on-site generation unit capable of 100 lb/d chlorine dose. Salt bags are stored at the facility. Plant effluent is treated with a small RO unit to produce water for mixture with the salt in a brine tank. Chlorine is manually dosed, day-to-day operation. No effluent flow meter is installed.</p> <p><u>Recommended Project:</u> Drill well for reliable water supply to reduce risk of failure from the multitude of water treatment components. Well can be drilled adjacent to operations building to minimize pipe runs to on-site generation equipment.</p>		
Priority	Mid-Term (2-6 Years)		
Project Need			
Reliability	<input checked="" type="checkbox"/>	Process Performance	<input checked="" type="checkbox"/>
Capacity	<input type="checkbox"/>	Regulatory	<input checked="" type="checkbox"/>
District Policy & Goals	<input type="checkbox"/>		
Project Cost			
Construction Cost			
Estimated Construction Cost		\$	336,000
Soft Costs			
<i>Classification 'B'</i>			
Engineering & Permitting	10% of construction cost	\$	34,000
CM & ESDC	18% of construction cost	\$	60,000
Administration	5% of construction cost	\$	17,000
Soft Cost Subtotal		\$	111,000
Contingency			
Contingency	35% of project cost	\$	156,000
Total Project Cost		\$	604,000

Project No.	LS-1		
Project Name	Lake Gregory Wet Well Capacity Upgrade		
Description	<p>The Lake Gregory pump station wet well is under-sized and currently, layers of mitigation measures are in place to compensate for a limited hydraulic capacity of the wet well and lack of emergency storage. Mitigation measures already in place to avoid a spill include a backup force main, generator, automatic transfer switch, battery backup on the control system, and a standpipe for full lift station bypass pumping.</p> <p><u>Recommended Project:</u> Construct emergency storage capacity to allow for additional failure response time. Project assumes approximately 20,000 gallons of below-grade emergency storage capacity. Recommend this project if and when additional connections come on-line, as this will otherwise further decrease wet well detention time.</p>		
Priority	Mid-Term (2-6 Years)		
Project Need			
Reliability	<input checked="" type="checkbox"/>	Process Performance	<input type="checkbox"/>
Capacity	<input checked="" type="checkbox"/>	Regulatory	<input checked="" type="checkbox"/>
District Policy & Goals	<input type="checkbox"/>		
Project Cost			
Construction Cost			
Estimated Construction Cost		\$	428,000
Soft Costs			
<i>Classification 'C'</i>			
Engineering & Permitting	15% of construction cost	\$	64,000
CM & ESDC	20% of construction cost	\$	86,000
Administration	5% of construction cost	\$	21,000
Soft Cost Subtotal		\$	171,000
Contingency			
Contingency	35% of project cost	\$	210,000
Total Project Cost		\$	808,000

Project No.	SC-5		
Project Name	Seeley Creek WWTP Access Road Replacement		
Description	<p>Based on the outcomes of the Seeley Creek WWTP Access Road Assessment, road repairs and/or replacement is expected to bring the access road back to safe driving conditions.</p> <p><u>Recommended Project:</u> Perform area-specific road improvements where slope stability and/or drainage is a concern. Provide new paving and guardrails as needed to restore safe access road conditions. Road length is approximately 6,200 feet at assumed 12' wide lane.</p>		
Priority	Mid-Term (2-6 Years)		
Project Need			
Reliability	<input checked="" type="checkbox"/>	Process Performance	<input type="checkbox"/>
Capacity	<input type="checkbox"/>	Regulatory	<input type="checkbox"/>
District Policy & Goals	<input type="checkbox"/>		
Project Cost			
Construction Cost			
Estimated Construction Cost		\$	2,645,000
Soft Costs			
<i>Classification 'B'</i>			
Engineering & Permitting	10% of construction cost	\$	265,000
CM & ESDC	18% of construction cost	\$	476,000
Administration	3% of construction cost	\$	79,000
Soft Cost Subtotal		\$	820,000
Contingency			
Contingency	35% of project cost	\$	1,213,000
Total Project Cost		\$	4,677,000

Project No.	HC-5		
Project Name	Huston Creek Primary Clarifiers Structural Assessment		
Description	<p>The existing Huston Creek WWTP Primary clarifiers were constructed in 1950. The existing clarifiers are at risk of failure from structural and geotechnical conditions, as the structures are over 70 years old and were constructed with thin (4") thick walls. With the new primary clarifier in service, the existing clarifiers can be shut down and dewatered to perform a structural inspection and assessment to determine the feasibility of rehabilitation of the clarifiers or if full replacement is needed.</p> <p><u>Recommended Project:</u> Perform a structural inspection and assessment of the two existing primary clarifiers to determine the condition of the existing structure and equipment, and provide recommendations for rehabilitation and/or replacement.</p>		
Priority	Mid-Term (2-6 Years)		
Project Need			
Reliability	<input checked="" type="checkbox"/>	Process Performance	<input checked="" type="checkbox"/>
Capacity	<input checked="" type="checkbox"/>	Regulatory	<input type="checkbox"/>
District Policy & Goals	<input type="checkbox"/>		
Project Cost			
Construction Cost			
Estimated Construction Cost			N/A
Soft Costs			
<i>Project Specific</i>			
Engineering & Permitting		\$	169,000
CM & ESDC		N/A	
Administration		N/A	
Soft Cost Subtotal		\$	169,000
Contingency			
Contingency	35% of engineering cost	\$	59,000
Total Project Cost		\$	228,000

Project No.	SC-6		
Project Name	Seeley Creek WWTP Ancillary Systems Upgrade		
Description	<p>Plant compressed air is delivered to processes as-needed by local compressors around the plant. The system used to be one, large compressor, but underground air piping failed and the larger system was abandoned. High pressure effluent (HPE) feeds plant water for multiple uses around the plant. HPE is used for irrigation, hose bibs, feed water for on-site chlorine generation, and other uses. There is currently an HPE piping leak at an unidentified location(s).</p> <p><u>Recommended Project:</u> Establish permanent solutions for ex. smaller compressors. Locate leak, if possible, and replace HPE line(s) with new pipe. Consider installing pipe in an accessible concrete trench with trench plates for easier access for maintenance. Replace air compressor and air piping and install a vault</p>		
Priority	Mid-Term (2-6 Years)		
Project Need			
Reliability	<input checked="" type="checkbox"/>	Process Performance	<input checked="" type="checkbox"/>
Capacity	<input checked="" type="checkbox"/>	Regulatory	<input type="checkbox"/>
District Policy & Goals	<input type="checkbox"/>		<input type="checkbox"/>
Project Cost			
Construction Cost			
Estimated Construction Cost		\$	368,000
Soft Costs			
<i>Classification 'C'</i>			
Engineering & Permitting	15% of construction cost	\$	55,000
CM & ESDC	20% of construction cost	\$	74,000
Administration	5% of construction cost	\$	18,000
Soft Cost Subtotal		\$	147,000
Contingency			
Contingency	35% of project cost	\$	180,000
Total Project Cost		\$	696,000

Project No.	SC-7		
Project Name	Seeley Creek Primary Clarifier Upgrade		
Description	<p>The District has identified erosion and concerning soils conditions on the north side of the Seeley Creek WWTP Primary Clarifier. Recently, the primary clarifier skimmer arm has gotten out of alignment and needs to be repaired. The structure should be inspected to determine if any differential settlement has occurred due to the erosion of the slope on the side of the clarifier.</p> <p><u>Recommended Project:</u> Based on the outcomes of the structural assessment, construct improvements to the primary clarifier that may include structural rehabilitation / reinforcement, erosion control and slope stability improvements, and mechanical equipment replacement.</p>		
Priority	Immediate Works (0-2 Years)		
Project Need			
Reliability	<input checked="" type="checkbox"/>	Process Performance	<input type="checkbox"/>
Capacity	<input type="checkbox"/>	Regulatory	<input type="checkbox"/>
District Policy & Goals	<input type="checkbox"/>		
Project Cost			
Construction Cost			
Estimated Construction Cost		\$	539,000
Soft Costs			
<i>Classification 'C'</i>			
Engineering & Permitting	15% of construction cost	\$	81,000
CM & ESDC	20% of construction cost	\$	108,000
Administration	5% of construction cost	\$	27,000
Soft Cost Subtotal		\$	216,000
Contingency			
Contingency	35% of project cost	\$	264,000
Total Project Cost		\$	1,019,000

Project No.	HC-6		
Project Name	Huston Creek Primary Clarifier Replacement		
Description	<p>Depending on the outcomes of the structural assessment of the existing primary clarifiers, the clarifiers will either need rehabilitation or be fully replaced. For the purposes of CIP budgeting, we recommend the District anticipate full replacement of the two existing primary clarifiers due to their age and structural design. Additionally, the clarifiers were originally Imhoff-style, so they have side slopes that reduce their volume and performance relative to modern clarifier design.</p> <p><u>Recommended Project:</u> Replace the two existing 70+ year old primary clarifiers. Clarifier improvements project should also address rehabilitation and/or replacement of to the existing operations building adjacent to the clarifiers to bring the structure and spaces up to current building and seismic codes.</p>		
Priority	Long-Term (7+ Years)		
Project Need			
Reliability	<input checked="" type="checkbox"/>	Process Performance	<input checked="" type="checkbox"/>
Capacity	<input checked="" type="checkbox"/>	Regulatory	<input type="checkbox"/>
District Policy & Goals	<input type="checkbox"/>		
Project Cost			
Construction Cost			
Estimated Construction Cost		\$	4,004,000
Soft Costs			
<i>Classification 'C'</i>			
Engineering & Permitting	15% of construction cost	\$	601,000
CM & ESDC	20% of construction cost	\$	801,000
Administration	5% of construction cost	\$	200,000
Soft Cost Subtotal		\$	1,602,000
Contingency			
Contingency	35% of project cost	\$	1,962,000
Total Project Cost		\$	7,567,000

Project No.	CL-1		
Project Name	Cleghorn WWTP Concrete Structures Rehabilitation		
Description	<p>Oxidation ditch is an extended-aeration activated sludge process, which is a simple process designed with a long SRT designed to remove BOD. Liner is peeling, and bubbling out, and increasing corrosion potential to the concrete once it's breached. Basin discharge side of ditch experincing corrosion and degradation, especially in the "splash zone" by the aerator. Single-duty circular secondary clarifier functions to capture and settle sloughed solids from the trickling filter and return them to the primary clarifier. Liner is peeling off.</p> <p><u>Recommended Project:</u> Remove failed oxidation ditch and secondary clarifier liners, inspect structural integrity, rehab concrete, reline. Perform concrete rehab on basin discharge side of ditch.</p>		
Priority	Immediate Works (0-2 Years)		
Project Need			
Reliability	<input checked="" type="checkbox"/>	Process Performance	<input type="checkbox"/>
Capacity	<input type="checkbox"/>	Regulatory	<input type="checkbox"/>
District Policy & Goals	<input type="checkbox"/>		
Project Cost			
Construction Cost			
Estimated Construction Cost		\$	171,000
Soft Costs			
<i>Classification 'C'</i>			
Engineering & Permitting	15% of construction cost	\$	26,000
CM & ESDC	20% of construction cost	\$	34,000
Administration	5% of construction cost	\$	9,000
Soft Cost Subtotal		\$	69,000
Contingency			
Contingency	35% of project cost	\$	84,000
Total Project Cost		\$	323,000

Project No.	CL-2		
Project Name	Cleghorn WWTP Sludge Wasting and Clarifier Upgrades		
Description	<p>Cleghorn has a single duty racetrack-style oxidation ditch with a single mechanical brush aerator. Little to no process control exists for the activated sludge. DO is monitored but not used as a control parameter, and RAS pumps operate on a timer. Activated sludge wasting functions to remove aged biomass from the activated sludge for biomass control. Currently, no infrastructure mechanism is in place to facilitate sludge wasting, other than to manually draw off the RAS line and fill a tanker truck, which hauls the waste sludge to Houston Creek. This wasting process currently occurs approximately two times per year.</p> <p><u>Recommended Project:</u> Construct a sludge handling facility near the RAS pump station to allow for more consistent and reliable wasting operations. Construct a redundant RAS pump and pipe gallery configuration to facilitate wasting.</p>		
Priority	Mid-Term (2-6 Years)		
Project Need			
Reliability	<input checked="" type="checkbox"/>	Process Performance	<input checked="" type="checkbox"/>
Capacity	<input type="checkbox"/>	Regulatory	<input type="checkbox"/>
District Policy & Goals	<input type="checkbox"/>		
Project Cost			
Construction Cost			
Estimated Construction Cost		\$	121,000
Soft Costs			
<i>Classification 'C'</i>			
Engineering & Permitting	15% of construction cost	\$	18,000
CM & ESDC	20% of construction cost	\$	24,000
Administration	5% of construction cost	\$	6,000
Soft Cost Subtotal		\$	48,000
Contingency			
Contingency	35% of project cost	\$	59,000
Total Project Cost		\$	228,000

Project No.	CL-3		
Project Name	Cleghorn WWTP Oxidation Ditch Upgrade		
Description	<p>Oxidation ditch is an extended-aeration activated sludge process, which is a simple process designed with a long SRT. The activated sludge process is designed to remove BOD.</p> <p>Cleghorn has a single-duty racetrack-style oxidation ditch with a single mechanical brush aerator. It is powered by a 30-hp motor horizontally mounted across the width of the track. The brush aerator acts to mix, maintain velocity, and entrain DO into the activated sludge in the ditch.</p> <p><u>Recommended Project:</u> Add a second aerator for redundancy. Alternatively, consider changing aeration technology. Single-duty critical equipment carries high risk even when mitigation is in place.</p>		
Priority	Mid-Term (2-6 Years)		
Project Need			
Reliability	<input checked="" type="checkbox"/>	Process Performance	<input checked="" type="checkbox"/>
Capacity	<input type="checkbox"/>	Regulatory	<input type="checkbox"/>
District Policy & Goals	<input type="checkbox"/>		
Project Cost			
Construction Cost			
Estimated Construction Cost		\$	520,000
Soft Costs			
<i>Classification 'C'</i>			
Engineering & Permitting	15% of construction cost	\$	78,000
CM & ESDC	20% of construction cost	\$	104,000
Administration	5% of construction cost	\$	26,000
Soft Cost Subtotal		\$	208,000
Contingency			
Contingency	35% of project cost	\$	255,000
Total Project Cost		\$	983,000

Project No.	CL-4		
Project Name	Cleghorn WWTP Headworks Upgrade		
Description	<p>Plant influent flows through one bar screen, with 2-inch wide bar spacing, then through a channel Muffin Monster unit before flowing into the oxidation ditch. Influent contains higher levels of rags, debris, clothes, and other items found at a campsite, some of which can make it through the 2-inch bar screen. No engineered grit removal process exists at the plant. Grit is manually shoveled out of the influent channels and typically settles out near the screens or in the oxidation ditch. Spills could occur during high flow conditions. Collection system is owned, operated, and maintained by the State. Therefore, the District has limited information and control over the influent characteristics. Influent tends to vary widely depending on lift station activity, septic dumps, wet weather, holidays, and other factors.</p> <p><u>Recommended Project:</u> Remove Muffin Monster and install an automatic screenings unit in place of existing bar screen. Install grit removal system. If hydraulic capacity issue exists, enlarge influent channels or install new upsized channels. New screenings and grit removal will likely require low-head pumping system to account for hydraulic head losses through new equipment.</p>		
Priority	Mid-Term (2-6 Years)		
Project Need			
Reliability	<input checked="" type="checkbox"/>	Process Performance	<input checked="" type="checkbox"/>
Capacity	<input checked="" type="checkbox"/>	Regulatory	<input type="checkbox"/>
District Policy & Goals	<input type="checkbox"/>		
Project Cost			
Construction Cost			
Estimated Construction Cost		\$	1,606,000
Soft Costs			
<i>Classification 'C'</i>			
Engineering & Permitting	15% of construction cost	\$	241,000
CM & ESDC	20% of construction cost	\$	321,000
Administration	5% of construction cost	\$	80,000
Soft Cost Subtotal		\$	642,000
Contingency			
Contingency	35% of project cost	\$	787,000
Total Project Cost		\$	3,035,000

Project No.	CL-5		
Project Name	Cleghorn WWTP On-Site Generation System Upgrade		
Description	<p>Chlorine generation equipment consists of 1 Micro-Chlor onsite generation unit. Salt bags are stored at the facility. Potable water used for mixture with the salt in a brine tank. Chlorine is manually dosed day-to-day. Residual testing is done via grab sample. Skid failure could occur under a multitude of points, including brine tank. Manual operatoin with no control or flow-pacing.</p> <p><u>Recommended Project:</u> Replace existing Micro-Chlor OSG unit.</p>		
Priority	Long-Term (7+ Years)		
Project Need			
Reliability	<input checked="" type="checkbox"/>	Process Performance	<input checked="" type="checkbox"/>
Capacity	<input type="checkbox"/>	Regulatory	<input type="checkbox"/>
District Policy & Goals	<input type="checkbox"/>		
Project Cost			
Construction Cost			
Estimated Construction Cost		\$	96,000
Soft Costs			
<i>Classification 'D'</i>			
Engineering & Permitting	5% of construction cost	\$	5,000
CM & ESDC	5% of construction cost	\$	5,000
Administration	5% of construction cost	\$	5,000
Soft Cost Subtotal		\$	15,000
Contingency			
Contingency	35% of project cost	\$	39,000
Total Project Cost		\$	149,000