Gleneden Sanitary District

LINCOLN COUNTY, OREGON

Wastewater Treatment Plant

Facility Plan

March 2023

GLENEDEN GSD SANITARY DISTRICT

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Gleneden Sanitary District

LINCOLN COUNTY, OREGON

Wastewater Treatment Plant
Facility Plan

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0.00 EXECUTIVE SUMMARY

0.01 Purpose

This Executive Summary is a quick synopsis of the content included in the larger report. References have been made to the respective sections where additional detail can be found.

0.02 Background

The Gleneden Sanitary District (GSD) owns, operates, and maintains a wastewater collection system that serves unincorporated communities within Lincoln County along the central Oregon coast. The system was first placed into service in 1976 and covers the area between Salishan and Fogarty Creek.

The wastewater from the collection system is conveyed south to the Fogarty Creek State Recreational Area. A pump station within the state park parking lot pumps wastewater to the City of Depoe Bay collection system for treatment at the Depoe Bay Wastewater Treatment Plant. The District and City use these shared facilities according to an intergovernmental agreement (IGA) last updated in 1998 (Appendix A). The IGA requires GSD and the City to share financial responsibility for the joint facilities in proportion to the equivalent dwelling units served by each party. On March 1, 2022 the City of Depoe Bay issued a letter to the GSD enacting the termination clause in the IGA (Appendix B). Consequently, GSD must find an alternative means to treat wastewater beginning 5-years from the date of the IGA notice of termination, March 1, 2027.

GSD contracts with the Kernville-Gleneden Beach-Lincoln Beach (KGBLB) Water District to operate and maintain the wastewater collection system. This arrangement allows the two Districts to share staff, offices, vehicles and some materials, thereby controlling costs by avoiding unnecessary duplications. The Water District covers the area served by GSD, plus the Salishan Resort and private community, the Siletz Keys neighborhood, and the Kernville neighborhood areas.

0.03 Need for Planning Effort

Depoe Bay has made it clear that they are not interested in continuing to treat wastewater from GSD in the future. Several attempts have been made at negotiating with Depoe Bay to continue treating GSD wastewater without success. Although it is the desire of the District that the IGA with Depoe Bay can be renewed, they have acknowledged the need to prepare for developing an alternative means of wastewater treatment. This facility plan for wastewater treatment is intended to identify options for the District to develop alternative treatment means, support long-term planning for the District's wastewater treatment and collection systems, and provide guidance to the District by identifying the steps necessary for developing alternative treatment options.

The District will require funding support to design and construct any new treatment alternatives identified in this report. In order to meet the criteria of several of the most common funding agencies, including DEQ, Business Oregon, US Department of Agriculture (USDA) and the Rural Community Assistance Corporation (RCAC), it is necessary to develop a wastewater facility planning document to confirm that the proposed project protects public health and maintains a high quality of life, is environmentally sound, and is an efficient use of public funds. This document is being prepared to satisfy those requirements and has been developed to conform with *Preparing Wastewater Planning Documents and Environmental Reports for Public Utilities* (Business Oregon, USDA, RCAC, DEQ, 2019).

0.04 Purpose and Scope of Study

The purpose of this study is to identify and evaluate feasible wastewater treatment options to meet the District's projected service needs. This report builds upon the A*nalysis of Wastewater Options, Phase 1* (Harper Houf Peterson Righellis, Inc., 2020) (Appendix E), and, to avoid duplication of effort, draws upon information in that previous report.

0.05 Requirements for Wastewater Treatment Facilities

05.1 National Pollutant Discharge Elimination System (NPDES) Phase 1 Permit

A permit must be obtained from the Oregon Department of Environmental Quality (DEQ) to construct and operate a wastewater treatment plant in Oregon and to discharge treated effluent from the facility. DEQ issues two types of permits: 1.) an NPDES permit is required for wastewater treatment plants that discharge into surface waters, and 2.) a WPCF permit is required for facilities that recycle effluent according to DEQ regulations.

DEQ's authority to issue these permits is established in OAR 340-045. The permits are required to keep wastewater facilities in compliance with the Federal Water Pollution Control (Clean Water) Act and related State statutes. The conditions of operation described in the permits generally fall into the following categories:

- discharge flow rate limits
- pollutant concentration and total load limits
- biosolids pollutant concentrations and load limits for land application
- effluent monitoring and reporting
- biosolids monitoring and reporting
- minimum required training level for operators
- other general conditions of operation

The Depoe Bay wastewater treatment plant has been issued National Pollutant Discharge Elimination System (NPDES) Permit No. 101383 (Appendix D). GSD does not have its own NPDES permit but rather operates under the authority of the Depoe Bay permit. The IGA between the District and Depoe Bay obligates the District to construct and operate the District's collection system in accordance with DEQ rules and regulations.

05.2 Treatment Requirements

NPDES permits for a surface-water discharge contain effluent quality limitations that are either based on the receiving water body water quality standards or a minimum required treatment level. The effluent limits in the permit determine required wastewater treatment plant design criteria.

05.3 Effluent Water Quality Criteria

Current water quality standards for Oregon waters are published in OAR 340-041 and include both state-wide and basin-specific water quality criteria. GSD and the surrounding vicinity are located in the Mid-Coast Basin. This basin encompasses watersheds and near-shore ocean waters from the Salmon River north of Lincoln City, to streams in the Oregon Dunes National Recreation Area south of Florence.

Wastewater effluent quality criteria for each specific water body are impacted by the designated beneficial uses identified in the water quality standards for the respective water body. The beneficial uses DEQ has designated for water bodies in the Mid Coast Basin are summarized in Chapter 6.

05.4 Projected Population Methodology

The 2021 calculated population of the District is 4,770 people considering residential EDUs only. The residential equivalent population served by the District is estimated to be 4,886 people including all EDU's. This population was determined by multiplying the total number of EDUs by the average number of persons per household in unincorporated areas of Lincoln County (2.2 Persons Per Household) as reported in the 2010 U.S. Census (U.S. Census Bureau, 2021). This population estimate is slightly higher than the population estimates presented in the District's *2018 Wastewater Collection System Facilities Plan Update* which estimated the 2022 population for the District at 4,428 persons (Harper Houf Peterson Righellis, Inc., 2018).

The HHPR report assumed that the growth rates and the average persons per household was a blend between the two neighboring communities of Depoe Bay and Lincoln City. Consequently, their projections used the District's 2017 EDU count, an average number of persons per household of 2.0 persons, and an AAGR of 0.9% to estimate the 2022 population.

Depoe Bay's average persons per household is the lowest in all of Lincoln County and likely underrepresents the District. Therefore, we have chosen to use the average Lincoln County persons per household of 2.2 people. Similarly, the AAGR of Depoe Bay was the highest in all of Lincoln County and does not correspond well with the observed growth rate of the District. However, all of the Lincoln County communities along the coast showed positive growth over the past decade, while the non-coastal areas of the County showed no-growth or negative growth. We have therefore chosen to use an AAGR that corresponds to the District observed growth of 0.2% which is higher than the Outside UGBs AAGR of -0.1% but lower than the Depoe Bay AAGR during the same period of 0.8%. Therefore, the projected residential equivalent population of the District at the end of the planning period in the year 2040 is 5,085 people, corresponding to 2,335 EDUs. The 2021 PSU PRC forecast for Lincoln County is shown

TABLE 04-1 LINCOLN COUNTY POPULATION ESTIMATES

	Historical			Estimates		Forecast			
Location	**2000**	**2010**	**AAGR (2000-2010)**	**2020**	**AAGR (2010-2020)**	**2045**	**2070**	**AAGR (2020-2045)**	**AAGR (2045-2070)**
Lincoln County (Overall)	44,479	46,034	0.3%	48,304	0.5%	53,500	53,858	0.4%	0.0%
Outside UGBs	17,036	17,216	0.1%	17,064	-0.1%	17,649	16,041	0.1%	-0.4%
Larger Sub-Areas									
Lincoln City	8,752	8,987	0.3%	9,671	0.7%	10,827	10,835	0.5%	0.0%
Newport	9,971	10,431	0.5%	11,882	1.3%	12,223	11,082	0.1%	-0.4%
Smaller Sub-Areas									
Depoe Bay	1,107	1,337	2.7%	1,450	0.8%	3,602	6,602	3.6%	2.4%
Siletz	1,150	1,322	1.4%	1,302	-0.1%	1,542	1,676	0.7%	0.3%
Toledo	3,698	3,783	0.2%	3,782	0.0%	3,827	3,422	0.0%	-0.4%
Waldport	2,229	2,258	0.1%	2,373	0.5%	2,810	3,014	0.7%	0.3%
Yachats	626	701	1.1%	780	1.1%	1,020	1,187	1.1%	0.6%

Sources: U.S. Census Bureau; PRC Estimates; Forecast by Population Research Center (PRC).

in Table 04-1 and the District population and EDU forecast through the planning period is summarized in Table 04-2.

TABLE 04-2 DISTRICT POULATION AND EDU FORECAST THROUGH PLANNING PERIOD

Forecast for District EDUs and Average Population				
Year	**Total EDU's** (1)	**Residential Equivalent Estimated Population** (2)	**Residential EDUs**	**Estimated Population** (3)
2020	2,221	4,886	2168	4,770
2025	2,243	4,935	2,190	4,817
2030	2,266	4,985	2,212	4,866
2035	2,289	5,035	2,234	4,915
2040	2,312	5,085	2,256	4,964
2045	2,335	5,136	2,279	5,014

(1) EDU and population projections based upon 0.2% AAGR and 2020 EDU count compiled by District

(2) Residential Equivalent Pop. Based on all EDUs in District with 2.2 PPH

(3) Residential EDUs only with 2.2 PPH

For the purposes of this study, the 2045 equivalent estimated population is 5,136 people. This is the population number that will be used for future flow projections.

0.06 Design Criteria

06.1.1 Hydraulic Design Criteria

Hydraulic design criteria have been determined by analyzing historical flow rates from the District as measured by the flow meter at the Depoe Bay Wastewater Treatment Facility (WWTF), year 2021 and 2045 projected populations, and corresponding equivalent dwelling units (EDU's).

Wastewater from Gleneden Sanitary District (GSD) is pumped to the Depoe Bay WWTF via the Fogarty Creek Pump Station. Incoming flows are tracked at the at the Depoe Bay WWTF by a flow meter and documented as part of Depoe Bay's Daily Monitoring Report (DMR). Flow data from GSD was compiled from 2016 through 2021 to develop a 5 year dry weather, wet weather, and composite flow average, then the existing condition flow rates were determined according to the methodology established in the *Guidelines for Making Wet-Weather and Peak Flow Projections for Sewage Treatment in Western Oregon: MMDWF, MMWWF, PDAF, and PHF* (Oregon DEQ). The existing existing-condition flow rate analysis is discussed in detail in Chapter 3, Section 3.6.1 *Existing Flow Rates*.

Using EDU projections for the end of the year 2045 planning period developed in Chapter 2, and existing flow rates per EDU developed in Chapter 3, projected flow rates at the end of the planning period were determined and are shown in TABLE 05-1 below.

The treatment facility is required by DEQ to be able to treat the Ten-Year Maximum Month Dry Weather Flow Rate ($MMDWF_{10}$) of 0.318 MGD and the Five-Year Maximum Month Wet Weather Flow Rate ($MMWWF_5$) of 0.443 MGD.

DEQ guidelines for wastewater conveyance and treatment require critical system components to be designed to convey the 5-year Peak Instantaneous Flow (PIF) which represents the highest flowrate over the course of an hour that the plant may experience in a 5-year period. The PIF corresponding to the 5-year, 24-hr storm was calculated from a plot of flow rate versus recurrence probability. The determination of the present day PIF and PFW are detailed in Chapter 3, Section 6.1.3. The peak instantaneous flow for the end of the planning period was calculated to be 1.235 MGD.

TABLE 05-1 GSD EDU FLOWRATE PROJECTIONS

Parameter	Current Flow Rates (MGD)	Flow per EDU (gal/EDU)	Estimated 2045 Flow Rates (MGD)
Annual Flow Rates			
AAF	0.270	121	0.283
Dry Weather Flow Rates			
ADWF	0.239	107	0.251
Base Sewerage	0.239	107	0.251
$MMDWF_{10}$	0.318	143	0.334
Wet Weather Flow Rates			
AWWF	0.305	137	0.320
$MMWWF_5$	0.443	199	0.465
Peak Week (PWF)	0.558	251	0.585
Peak Day ($PDAF_5$)	0.919	413	0.964
Peak Instantaneous Flow $(PIF)_5$	1.178	529	1.235

06.1.2 Loading Design Criteria

Projected total pollutant loads at the end of the planning period were determined by comparing sampling data collected from the Fogarty Creek Pump Station with standard loading data from Metcalf & Eddy (Metcalf & Eddy, 2014). Existing loading data is analyzed and discussed in detail in Section 3.6.2, *Existing Pollutant Loading Rates.* Assuming that pollutant loads measured in pounds per capita day (ppcd) will remain the same, future loading can be predicted by multiplying this loading by the projected future equivalent population of the district at the end of the planning period. The maximum monthly dry weather flow is typically the controlling flow rate in establishing design loading for secondary treatment. Although flow rates may increase during winter months as a result of inflow and infiltration, loading for the District is highest in the summer during peak occupancy.

The sampling time frame was relatively short and produced a correspondingly small data set. The sampling information was compared to typical per capita loading rates from literature. In all instances, sampling loading rates were less than typical loading rates from literature. Therefore, the literature loading rates were selected as the design criteria because they are more conservative. Design loading and process sizing will be refined during preliminary design. A comparison of the sampled loading rates with typical loading rates is shown in Table 4-3 below.

TABLE 05-2 LOADING RATE COMPARISON

Constituent	Loading Rate (ppcd) Measured	Literature[1]	Loading Rate for Analysis (ppcd)
BOD5	0.08	0.20	0.20
COD	0.29	0.50	0.50
TSS	0.066	0.19	0.19
TKN	0.025	0.31	0.31
Ammonia-N	0.016	0.017	0.017
Total Phosphorous	0.0033	0.0048	0.0048

[1]Typical per capita loading rate with ground up kitchen waste from Table 3-13 (Metcalf & Eddy, 2014).

Total projected daily loading at the end of the planning period is shown in Table 4-4 below.

TABLE 05-3 ESTIMATED DAILY LOADING RATE

Parameter	Per Capita Loading Rate (ppcd)	Estimated Peaking Factor	Estimated Loading Rates (ppd) 2021	2045
Five-day Biochemical Oxygen Demand				
Annual Average	0.20	1.00	980	1,027
Max Month	0.27	1.33	1,303	1,366
Total Suspended Solids				
Annual Average	0.19	1.00	931	976
Max Month	0.25	1.33	1,238	1,298
Ammonia				
Annual Average	0.017	1.00	83	87
Max Month	0.024	1.40	117	122

Notes:
1. Annual Average per capita loading rates are taken from Metcalf & Eddy, Table 3-13 (column 4) due to lack of long term analytical data specifically for the District.
2. Max Month per capita loading rates were estimated by multiplying the annual average per capita loading rate by the typical 30-day sustained peak peaking factor shown in Metcalf & Eddy, Figure 3-3. Given the limited number of non-residential EDUs in the District, those EDUs were assumed to have wastewater constituent compositions similar to residential EDUs.

06.1.3 Redundancy and Reliability Design Criteria

Equipment Redundancy and Reliability

The EPA classifies wastewater facilities into one of three classes depending upon the level of redundancy and reliability that are needed to protect the receiving waters. Those classifications are defined in the EPA Technical Bulletin, *Design Criteria for Electrical, Mechanical, and Fluid Systems and Component Reliability* (EPA, 1974).

The Gleneden Wastewater Treatment Plant will likely be classified as a Class II facility since the proposed outfall is in the Pacific Ocean. The facility will have to comply with the requirement of this technical bulletin which dictates what the facility must contain and be able to do to prevent failures. This document requires a Class II treatment facility must include backups or redundancy to ensure continued operation without environmental harm if part of the system fails.

Design Flow Compliance Probability

The treatment facility is required by DEQ to be able to treat the Ten-Year Maximum Month Dry Weather Flow Rate (MMDWF10) of 0.318 MGD and the Five-Year Maximum Month Wet Weather Flow Rate (MMWWF5) of 0.443 MGD. DEQ also requires critical system components to be designed to convey the Peak Instantaneous Flow (PIF) of 1.235 MGD.

0.07 Alternatives Analysis

Several alternatives have been considered to provide wastewater treatment for the District including:

1. Do nothing: this alternative implies that the District will make no changes and maintain status quo by sending their wastewater to Depoe Bay. The District has made every reasonable attempt to retore the status quo relationship with no success. Therefore, this alternative must now be considered unfeasible.
2. Contract with an alternative wastewater district or municipality to treat the District's wastewater. Because none of the reasonably close facilities have the willingness nor capacity to accept wastewater from GSD this option is considered unfeasible.
3. Develop a Centrally Managed/Decentralized System: this alternative means to convert the District customers to on-site treatment facilities (septic systems) or develop several smaller wastewater treatment systems throughout the District all managed by the District. Implementing decentralized facilities is not considered a feasible option.
4. Develop an optimum combination of Centralized and Decentralized Systems: this alternative means to combine partially on-site treatment (usually solids settling or septic tanks) with a centralized treatment plant managed by the District. There is no operation value to removing solids early, therefore this option is not considered a viable alternative.
5. Optimize the current facilities. This alternative, although required to be included in the report, is not currently feasible because the District does not have its own WWTF and the City of Depoe Bay has presented the District with a termination notice. Even if the notice is rescinded or suspended, no current planning information is available regarding what is needed to maintain the Depoe Bay WWTF in service over the planning period.
6. Construct a new wastewater treatment facility. Based on the lack of other viable alternatives, the District is forced into a position of constructing a new wastewater treatment facility. The alternatives analysis for this facility are broken into three sections:
    a. Site Alternatives Evaluation. This analysis is completed in Chapter 6.
    b. Outfall Alternatives Evaluation. This analysis is completed in Chapter 7.
    c. Wastewater Treatment Process Alternatives Analysis. This analysis is completed in Chapter 8.

07.1 Alternatives Analysis: Treatment Plant Discharge

There are several discharge options that can be considered including:

1. Underground Injection. Because of the very restricted infiltration capacity of the soils, underground injection is not a viable alternative for the District.

2. Water Reuse. With the exception of irrigation, water reuse options are minimal. Since the majority of rainfall takes place in the season when vegetation is dormant, the District would not be able to irrigate during this period, which requires the District to have an alternative discharge location.
3. Inland surface water outfall to a river or creek. The only surface water with sufficient volume to accommodate an outfall year round is the Siletz River.
4. Ocean outfall. Many communities along the coast utilize ocean outfalls for their wastewater plants including the Cities of Florence, Yachats, Newport, Depoe Bay and Otter Crest. Lincoln City is planning to change their current outfall to Schooner Creek to an ocean outfall. There are several locations where ocean access is available where an ocean outfall can be extended.

The type and level of treatment that the District will need is highly dependent upon where the treated effluent is discharged. Discharges to waterbodies will require a regulatory mixing zone within which the effluent must meet water quality standards to protect beneficial uses and to prevent impairing the water quality of the receiving water.

Types of Permit Limits

Effluent limitations serve as the primary mechanism in NPDES permits for controlling discharges of pollutants to receiving waters. Effluent limitations can be based on either the best technology available to control the pollutants or limits that are protective of the water quality standards for the receiving water including beneficial uses and compliance with anti-degradation policy. These two types of permit limits are referred to as technology-based effluent limitations (TBELs) and water quality-based effluent limits (WQBELs) respectively. When a TBEL is not restrictive enough to protect the receiving stream, a WQBEL must be placed in the permit. (OR DEQ, 2018)

Water Quality Requirements of Discharges – Regulatory Mixing Zones

Wastewater effluent must be treated to a sufficient water quality standard so that residual pollutants will not have a detrimental effect on beneficial uses of the receiving water body and will not further degrade already impaired waters. Discharges are allocated a regulatory mixing zone (RMZ) by permit, and applicable water quality standards must be met at the edge of this zone before entering the receiving body. The mixing zone is the area within which the effluent is diluted with water from the receiving water body to reduce concentration levels of pollutants to an acceptable level. Consequently, the ability of a mixing zone to effectively dilute wastewater effluent is a function of the amount of water within the receiving water, the size of the mixing zone, and the initial concentration of the effluent.

Beneficial Uses

Wastewater effluent water quality standards are established to protect beneficial uses of the state's waters. Beneficial uses are designated for all waters of the state in the Oregon Administrative Rules for water quality standards (Chapter 340, Division 41). In some cases, beneficial uses vary by waterbody or reach. In other cases, uses are designated for all waters in a basin or sub-basin.

The Mid-Coast Basin, of which the District is a part, has designated beneficial uses for all streams, estuaries and adjacent coastal waters per the Table 06-1 below. More specific beneficial uses for fish, salmon and steelhead, shellfish, and recreational uses within the District are more specifically discussed in Section 6.1.3.

TABLE 06-1: MID-COAST BENEFICIAL USES

OAR 340-041-0220
Table 220A
Designated Beneficial Uses - Mid Coast Basin

Beneficial Uses	Estuaries & Adjacent Marine Waters	All Steams & Tributaries Thereto
Public Domestic Water Supply[1]		X
Private Domestic Water Supply[1]		X
Industrial Water Supply	X	X
Irrigation		X
Livestock Watering		X
Fish & Aquatic Life[2]	X	X
Wildlife & Hunting	X	X
Fishing[3]	X	X
Boating	X	X
Water Contact Recreation[3]	X	X
Aesthetic Quality	X	X
Hydro Power		X
Commercial Navigation & Transportation	X	

[1] With adequate pretreatment (filtration & disinfection) and natural quality to meet drinking water standards.
[2] See also Figures 230A and 230B for fish use designations for this basin.
[3] For coastal water contact recreation and shellfish harvesting uses, see also Figures 220C (Salmon River Estuary), 220D (Siletz Bay), 220E (Yaquina Bay), 220F (Alsea River Estuary), 220G (Yachats River Estuary), and 220H (Siuslaw River Estuary)

Anti-Degradation

Wastewater effluent must also comply with the State's anti-degradation policy. *A fundamental premise of the Clean Water Act is the maintenance and restoration of the chemical, physical, and biological integrity of the Nation's waters. This concept forms the basis for what is referred to as antidegradation. Antidegradation policy is an integral component of DEQ's water quality standards. The antidegradation policy complements the use of water quality criteria. While criteria provide the absolute minimum values or conditions that must be met in order to protect designated uses, the antidegradation policy offers protection to existing water quality, including instances where that water quality equals or is better than the criteria. Antidegradation policy prohibits degradation of water quality in some circumstances and provides for exceptions to this prohibition in others; however, degradation of water quality is allowed only after a systematic decision-making process considering many factors. These factors include the classification of* *the waterbody, consideration of alternative treatments to the proposed activity, and comparison of economic and social benefits with environmental costs. In addition, the antidegradation policy requires the involvement of the public through direct notice and through coordination with other government agencies. In this way, decisions to maintain or to change current water quality are made only after a deliberate and inclusive process*. (OR DEQ, 2001)

Within the District, only three waterbodies are currently listed per the DEQ's 2022 approved Integrated Report (OR DEQ, 2022):

1. Gleneden Beach: The beach and waters immediately adjacent to the beach from Fogarty Creek to Siletz Bay is listed as impaired for shellfish toxins.
2. Siletz Bay and Estuary: The bay and estuary are listed as impaired for temperature- (year round), and toxic substances for both aquatic life and human contact.
3. Siletz River: The river is listed as impaired for temperature (year round).

A summary of the costs of various outfall locations and site development costs is included in Table 06-2.

07.2 Alternatives Analysis: Treatment Plant Site

The Gleneden Sanitary District (GSD) collection system currently moves wastewater from north to south via a combination of gravity sewers and pump stations. Consequently, without significant infrastructure changes and modifications to the collection system, the logical area for a future wastewater treatment plant is toward the south end of the District. Another influencing factor in selecting a preferred site is where the treated effluent outfall will be located. If the outfall was to the Siletz River, which is to the north of the District, either the untreated wastewater or the treated effluent would need to be pumped back to the north end of the District. An ocean outfall could be located anywhere north to south within the District based upon the availability of an east-west corridor between the plant and the Ocean. Finally, the site must accessible, must be flat and large enough to construct a multi-acre facility, and must be available for procurement by the District. For evaluation purposes it was decided that 4 acres is a reasonably sized property to accommodate the initially needed processes and activities at the plant and was used as the size to compare various site development costs. Sites were also evaluated on their growth potential, and development costs for expanded the sites to 8 acres were also considered.

Three sites were chosen for further evaluation and meet the criteria described above. Existing owners were queried and all sites are potentially available for purchase by the District. The three possible site locations are also shown in Figure 7-1. Cost analysis for the various site alternatives include the following cost components:

- site access and utility extension to the site
- site grading to level the site in preparation for construction of the treatment facility
- site utilities, roads, sidewalks, site lighting and pavement
- modifications to the Fogarty Creek Pump Station and extension of the new forcemain to the site
- construction of the outfall pipeline to direction drilling pit at the beach
- Land acquisition costs. Cost per acre is based upon Lincoln County appraised land value for 2022.

A summary of the costs of various outfall locations and site development costs is included in Table 06-2.

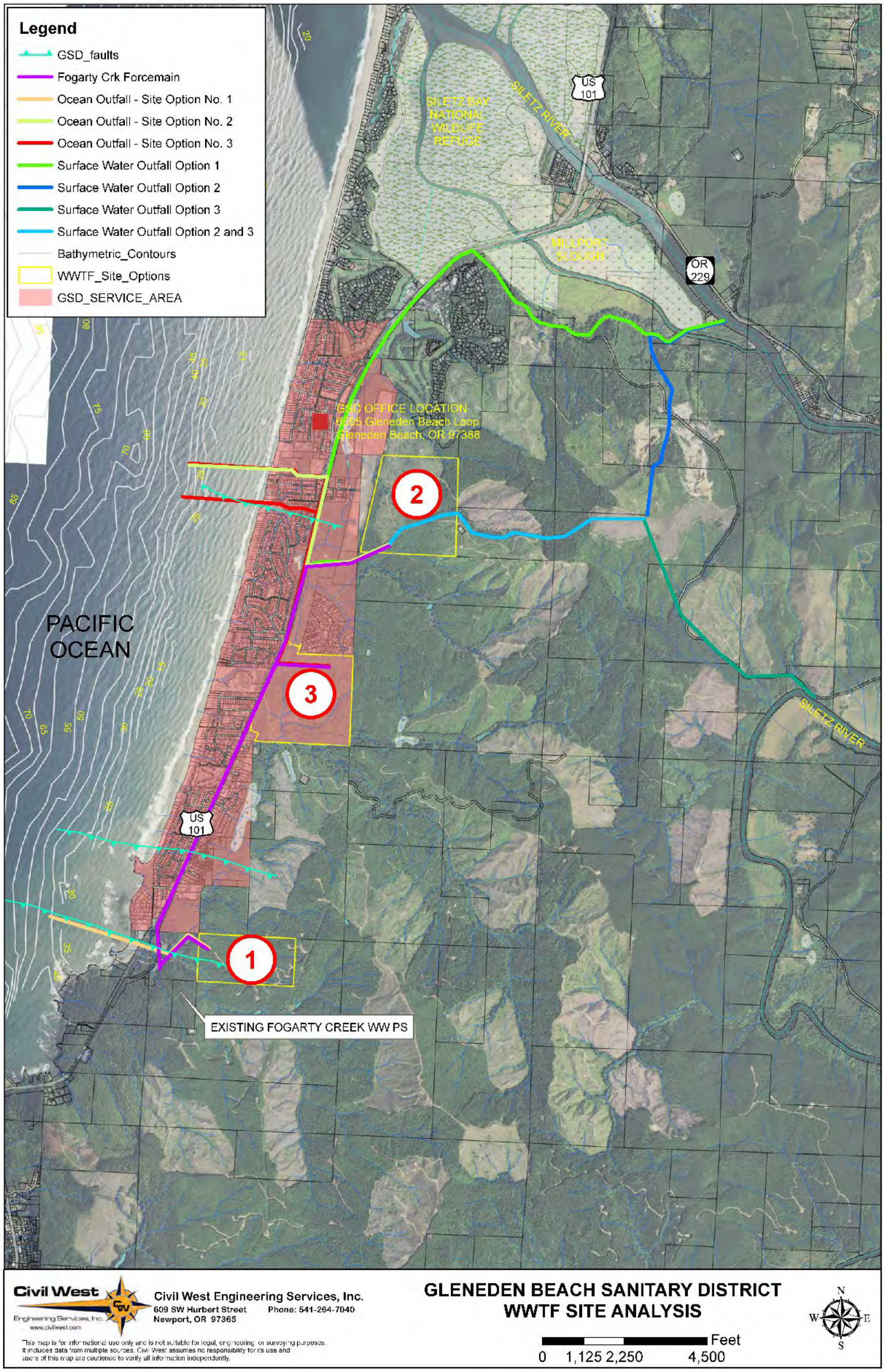

FIGURE 06-1 - GSD ALTERNATIVES MAP

TABLE 06-2: OUTFALL AND SITE ALTERNATIVES COST SUMMARY

	Site Option No. 1			Site Option No. 2		Site Option No. 3	
	4 acres	8 acres	4 acres Alt. Access	4 acres	8 acres	4 acres	8 acres
Ocean Outfall	$24,055,734	$26,229,993	$17,369,154	$18,640,588	$19,640,572	$16,474,535	$18,047,218
Siletz Outfall - Opt 1	$38,441,391	$40,615,650	$31,754,811	$28,340,396	$29,340,380	$29,486,097	$30,486,082
Siletz Outfall - Opt 2	$37,444,201	$39,618,459	$30,757,621	$27,343,205	$28,343,190	$28,488,907	$29,488,892
Siletz Outfall - Opt 3	$36,372,274	$38,546,533	$29,685,694	$26,271,279	$27,271,263	$27,416,981	$28,416,965

07.3 Alternatives Analysis: Treatment Process

The process of selecting the appropriate size and type of treatment equipment is dependent upon many factors. The primary considerations for equipment analysis and recommendations are based upon the following:

- Projected flow and loading through the planning period
- Expected water quality effluent limits determined by the outfall location
- Redundancy and Reliability Requirements
- Site constraints (size, topography, climate, proximity to other uses, etc.)
- Solids processing and handling constraints

The Loading Projections Summary developed in Chapter 4 and used in treatment system analysis are summarized in **Error! Reference source not found.** below.

TABLE 06-3: LOADING PROJECTIONS SUMMARY

Parameter	Per Capita Loading Rate (ppcd)	Estimated Peaking Factor	Estimated Loading Rates (ppd)	
			2021	2045
Five-day Biochemical Oxygen Demand				
Annual Average	0.20	1.00	980	1,027
Max Month	0.27	1.33	1,303	1,366
Total Suspended Solids				
Annual Average	0.19	1.00	931	976
Max Month	0.25	1.33	1,238	1,298
Ammonia				
Annual Average	0.017	1.00	83	87
Max Month	0.024	1.40	117	122

Notes:
1. Annual Average per capita loading rates are taken from Metcalf & Eddy, Table 3-13 (column 4) due to lack of long term analytical data specifically for the District.
2. Max Month per capita loading rates were estimated by multiplying the annual average per capita loading rate by the typical 30-day sustained peak peaking factor shown in Metcalf & Eddy,
3. Given the limited number of non-residential EDUs in the District, those EDUs were assumed to have wastewater constituent compositions similar to residential EDUs.

Expected Water Quality Limits

Based upon the challenges and costs associated with developing an inland surface water outfall, the analysis of wastewater equipment was premised upon developing an ocean outfall. Refer to Chapter 6 for more information on outfall analysis. An ocean outfall would likely result in effluent water quality limits being driven by a combination of water quality based and technology based effluent limits. Ocean beneficial uses include shellfish harvesting and recreation contact for which water quality based limits will apply. All other limits will be technology based limits. Estimated effluent limits are listed below in TABLE 06-4.

TABLE 06-4: ESTIMATED EFFLUENT WATER QUALITY LIMITS FOR AN OCEAN OUTFALL

Parameter	Units	Average Monthly	Average Weekly	Daily Maximum	Basis
BOD_5 (May 1 - Oct. 31)	mg/L	20	30	-	Applies the dry season and wet season effluent requirements for the Mid-Coast Basin (OAR 340-041-0225(4)) as they were applied in the Depoe Bay STP NPDES Permit (No. 101383). Note: OAR 340-041-0225(4)(b) appears to only require direct ocean discharges to implement secondary treatment; however, the more restrictive effluent requirements were imposed on the Depoe Bay STP and have been retained here for conservative planning.
	lb/day*	114	170	230	
	% Removal	85			
BOD_5 (Nov 1 - April 30)	mg/L	30	45	-	
	lb/day**	200	300	400	
	% Removal	85			
TSS (May 1 - Oct. 31)	mg/L	20	30	-	
	lb/day*	114	170	230	
	% Removal	85			
TSS (Nov 1 - April 30)	mg/L	30	45	-	
	lb/day**	200	300	400	
	% Removal	85			
Fecal Coliform	#/100 mL	A median concentration of 14 organisms per 100 mL. No more than ten percent of the samples may exceed 43 organisms per 100 mL.			Numeric criteria for designated shellfish harvesting areas for bacteria per OAR 340-041-0009(1)(c).
Enterrococci Bacteria	#/100 mL	A monthly geometric mean of 35 enterococcus organisms per 100 mL. No more than ten percent of the samples may exceed 130 organisms per 100 mL.			Numeric criteria for designated coastal water contact recreation areas for bacteria per OAR 340-041-0009(6)(a).
pH	S.U.	Shall be within the range of 6.0 - 9.0.			Review of other Mid-Coast Basin Municipal WWTP NPDES discharge permit requirements for facilities with ocean outfalls.
Excess Thermal Load	million kcal/day	No limit anticipated			
Ammonia	mg/L	No limit anticipated			
Residual Chlorine	mg/L	Reasonable potential analysis should be completed if chlorine-based disinfection process is proposed as an effluent limit may be imposed. Provisions for dechlorination should be considered during planning in the event a residual chlorine effluent limit is imposed.			Review of other Mid-Coast Basin WWTP NPDES discharge permit requirements for facilities with ocean outfalls. NPDES permits for the City of Newport STP and the Otter Crest Water Treatment Facility include residual chlorine effluent limit.

*Ten-Year Maximum Month Dry Weather Flow Rate ($MMDWF_{10}$) of 0.318 MGD and the Five-Year Maximum Month Wet Weather Flow Rate ($MMWWF_5$) of 0.443 MGD. Mass loads will be individually assigned based on what the plant can reasonably achieve and the highest monthly average discharge flow with a two year recurrence at the 20 year design of the facility (MMWWF5).

Cost Estimating

Assuming the District will use an ocean outfall, cost estimating has been limited to process equipment that will handle the projected flow and loading through the planning period, meet the expected water quality effluent limits determined by the outfall location, provide required redundancy and reliability, conform with the site constraints (size, topography, climate, proximity to other uses, etc.), and handle the solids processing and handling constraints.

Construction costs have been analyzed and reported by three levels of detail. The most general, called First Order costs, is for complete treatment plants of various types. All construction costs are included. The second level of detail, the Second Order costs, is for specific unit processes, such as clarifiers, chlorination, etc. The last level, the Third Order costs, is for the costs of various components required: excavation, electrical, instrumentation, etc. It is necessary to add associated non-construction costs to each cost order.

Details on First and Second order costs can be found in Chapter 8. For purposes of brevity, only Third order costs are discussed here. A summary of process equipment costs is included in TABLE 06-5 below.

TABLE 06-5: PROCESS SYSTEM COSTS SUMMARY

	Max.	Min.	Median
Activated Sludge	$11,312,180	$10,170,563	$10,707,887
Oxidation Ditch/Activated Sludge	$12,510,152	$10,179,830	$11,311,506
Sequencing Batch Reactor (SBR)	$11,389,146	$8,396,258	$9,780,144
Rotating Biological Contactor	$12,567,792	$11,426,175	$11,963,499
Trickling Filter	$12,130,570	$10,988,953	$11,526,277
Membrane Bioreactor	$12,713,679	$10,990,746	$11,852,213

07.4 Evaluation of Alternatives

The initial cost of the proposed improvements is an important consideration, however other factors should also be given careful consideration before settling on a site, outfall location, or treatment process. Operating costs, equipment sophistication, and the ability of a process to adapt to changing influent conditions, among other considerations, may influence the decision making process.

A summary of the costs to develop the various sites considered in this report are included below in Table 06-2. The three least costly sites are highlighted in green. Details on outfalls and site alternatives are included in Chapters 6 and 7 respectively. Since the cost to develop an outfall to the Siletz River is so high, the higher water quality standards that would be required with an inland discharge to the Siletz were not given significant consideration when evaluating treatment processes. Water quality standards associated with an ocean outfall would likely be met by a variety of treatment process options.

A summary of the costs to develop the various treatment processes considered in this report are included in TABLE 06-5. The three least costly treatment processes are highlighted in green. Details on process alternatives are included in Chapter 8. Depoe Bay currently uses an activated sludge process, while many of the neighboring wastewater systems employ SBR's.

Non-Monetary Factors

Several non-monetary issues were reviewed to compare various outfall and plant site locations. Each site was rated on a scale of 1 to 3, with a 1 indicating that the proposed location has relatively low difficulty in addressing that issue, and a 3 indicting that it will be difficult to overcome that issue with the proposed location. The option that scores the lowest will, in theory, be the easiest to permit and construct. Figure 06-2 evaluates various outfall locations while Figure 06-3 evaluates the various treatment plant site locations.

FIGURE 06-2: OUTFALL NON-MONETARY CONSIDERATIONS

	Environmental Implications/ Permitting	Cultural/ Historical/ Archeological Impact	Available space for construction	Land Acquisition	Public Impact During Construction	Water Quality Requirements	Total
Ocean Outfall Option No 1: Fogarty Beach Outfall	2[a]	1	1	2[f]	1	1	**8**
Ocean Outfall Option No 2: Wesler St Outfall	1	1	1	2[f]	3[h]	1	**9**
Ocean Outfall Option No. 3: Bella Beach Dr	1	1	2[d]	3[g]	3[h]	1	**11**
Siletz River Option 1: West to Hwy 101, north to Immonen Rd, east to Millport Slough Rd	3[b]	3[c]	2[e]	1	3[i]	3[k]	**15**
Siletz River Option 2: High point N. to Siletz at Millport Slough Rd	3[b]	3[c]	2[e]	1	2[j]	3[k]	**14**
Siletz River Option 3: High point S. to Siletz at Immonen Rd	3[b]	3[c]	2[e]	3g	2[j]	3[k]	**16**

severe/high difficulty	3
moderate difficulty	2
low difficulty	1

a: pipeline crosses creek and is installed in wetland area.
b: permitting discharge to Siletz will be lengthy and challenging
c: Siletz River has significant cultural/historiacl/archeological significance
d: Beach access is privately owned and space is tight
e: Outfall location is within ROW between prvately owned properties
f: property owned by State Parks
g: privately owned property
h: parking/beach access closed during const./work required within Hwy 101
i: work required within Hwy 101 and County Rd.
j: work required within County Rd.

FIGURE 06-3: SITE LOCATION NON-MONETARY CONSIDERATIONS

	Environmental Implications/ Permitting	Cultural/ Historical/ Archeological Impact	Available space for construction	Land Acquisition	Public Impact During Construction	Land Use Requirements	Total
Option 1: E. of Fogarty Creek State Park Site	2[a]	1	1	1	1	1	7
Option 2: E. of Airport Site	1	1	1	1	1	1	6
Option 3: S. of Seagrove Site	3[b]	2[c]	2[d]	2[e]	2[f]	2[g]	13

severe/high difficulty	3
moderate difficulty	2
low difficulty	1

a: access to site crosses stream and wetland
b: site and access bounded by wetland
c: unknown/undeveloped land
d: wetlands limit space available for development
e: privately owned/not investment forestry
f: immediately south of developed neighborhood
g: currently zoned residential - WWTF may not be considered compatable use to adjacent zoning

Treatment plant processes are evaluated in Figure 06-4 below. Only processes considered within this report are reviewed.

FIGURE 06-4: TREATMENT PROCESS NON-MONETARY CONSIDERATIONS

TREATMENT PROCESS	PERFORMANCE				OPERATIONAL CONSIDERATIONS			
	BOD	TSS	AMMONIA	PHOSPHORUS	PRO'S	CON'S	FOOT PRINT	OPERATING COST
ACTIVATED SLUDGE (AS)	Good	Require separate system (Clarifiers)	Good	Poor	• Well known technology	• Requires high efficiency aeration system • Continuous flow mode requires external stage following the AS unit • Requires closely controlled operational conditions	medium	$$
OXIDATION DITCH	Good	Require separate system (Clarifiers)	Good	Poor	• Low energy for aeration	• Requires aeration system • Requires external clarification stage following aeration • Requires closely controlled operational conditions	medium	$$
SEQUENCING BATCH REACTOR (SBR)	Good	Good	Good	Poor	• Flexibility • Does not require external clarification stage	• Requires high efficiency aeration system • Requires closely controlled operational conditions • Changes in loading require intervention • Requires skilled operator	medium	$$
ROTATING BIOLOGICAL CONTRACTOR (RBC)	Good	Require separate system (Clarifiers)	Variab le	Poor	• Low energy for aeration	• Requires external clarification stage following the RBC unit • Requires electrical supply for shaft motor • Requires closely controlled operational conditions • Sensitive to environmental conditions and fluctuations in influent quality (e.g., temperature, pH, flow, concentrations, etc.)	medium	$
TRICKLING FILTER	Good	Require separate system (Clarifiers)	Poor	Poor	• Minimal operation and maintenance requirements	• Requires pre-treatment (primary settling) • Sensitive to cold climate issues	medium	$
MEMBRANE BIOREACTOR (MBR)	Good	Very Good	Good	Good	• Tertiary quality effluent • Operation easily followed remotely • Retain bacteria such as E. Coli	• Requires pre-treatment • Requires aeration system • Performance closely linked to maintenance quality • Risk of membrane fouling (redundancy required)	small	$$$

(Mabarex Technologies, 2023)

Wastewater Treatment Process Evaluation

The least cost alternative of developing each site was added to the cost to develop the two least costly treatment processes and is shown in Table 06-6 below. The two least cost options are highlighted in green.

TABLE 06-6: LEAST COST OPTION COMPARISON

	Site Comparision Rating	Outfall Location Comparison Rating	Activated Sludge	Sequencing Batch Reactor
Site Option No. 1	7	8	$28,077,041	$27,149,298
Site Option No. 2	6	9	$29,348,475	$28,420,732
Site Option No. 3	13	11	$27,182,422	$26,254,679

$ range:	$3,093,796
% range:	12%
median:	$27,738,775

The least costly option is Site No. 3 using a Sequencing Batch Reactor (SBR). However, Site 3 and the associated outfall location are also the most difficult to develop. The second least costly option is Site No.1 also using an SBR. This site and outfall location have less obstacles to development.

Activated sludge and SBR's processes are relatively equivalent in their ability to produce good water quality, respond favorably to variable influent conditions, and in their level of sophistication to operate. SBR processes, since they are running batches of wastewater through various treatment stages, by their nature require significant automation. Activated sludge systems don't necessarily require the same level of automation, but practically speaking modern activated sludge plants are extensively automated. Although sophisticated, Supervisory Control and Data Acquisition (SCADA) systems can reduce operator hours, improve reporting accuracy, reduce reporting time, and improve compliance due to continuous monitoring.

Based upon this evaluation, it is recommended that the District consider pursuing the development of a new treatment plant facility at Site No. 1 using a Sequencing Batch Reactor.

0.08 Proposed Alternative Cost Estimate

The 2022 cost to develop Site No. 1 with a Sequencing Batch Reactor is estimated to be $27,149,298. At this level of planning, it is recommended to include a 30% contingency. ***The 2022 development cost including 30% contingency is $35,295,000***. Knowing it will take several years for the District to develop this facility, TABLE 06-7 below shows the development cost change over time adjusted by the average annual change in the Engineering News Record Construction Cost Index since 2006. (Engineering New Record, 2023)

TABLE 06-1: DEVELOPMENT COST INFLATIONARY CHANGE

17-yr Average CCI change: 3.19%

	2022 Preferred Option development cost	$27,149,298
	30% Contingency	$8,144,789
	2022 Total Cost	**$35,294,087**
Year 1	2023	$36,419,969
Year 2	2024	$37,581,766
Year 3	2025	$38,780,624
Year 4	2026	$40,017,726
Year 5	2027	$41,294,291
Year 6	2028	$42,611,579
Year 7	2029	$43,970,889
Year 8	2030	$45,373,560
Year 9	2031	$46,820,977
Year 10	2032	$48,314,566

0.09 Financing and Capital Improvement Plan

The project cost used for this analysis is $35,295,000. As discussed in Section 9.4, costs will increase annually approximately in relation to the annual average increase in the Construction Cost Index. See Table 9-4.

09.1 User Rates

There are currently 2221 active services in the community. Present 2022 sewer user rates are:

- Single Family Dwelling: $54 per month flat rate
- Multi-family/Commercial: $54 per month for 1,000 gallons or less – overage is billed at $18 for each 1,000-gallon unit
- Out of District (1.5x above rates): $81 for 1,000 gallons or less – overage is billed at $27 per 1,000-gallon unit

09.2 Debt Service

The District currently only has one loan. Recently the District acquired a loan from Oregon Department of Environmental Quality's Clean Water State Revolving Fund Loan Program (CWSRF) for collection system improvements. The projects funded through this loan are summarized in **Error! Reference source not found.**. Table 06-8 below summarizes the details of the loan. The debt payoff of this loan is accounted for in the current wastewater base rate of $54 per month.

TABLE 06-1: EXISTING DEBT

CWSRF LOAN NO. 1	
Original Loan Inception and Loan Term	2021/ 30-years
Original Loan Amount	$ 4,370,000.00
Annual Payment	$144,739
Remaining Time (years)	30
Remaining Balance	$4,370,000
Funding Agency	DEQ

09.3 SDCs

This District should consider establishing additional System Development Charges (SDCs) to recover costs associated with future growth. Additional details on SDC's is available in Section 10.3. The SDC improvement fee cost basis is the growth-allocable portion of planned wastewater system capital improvements. The total estimated project cost for a new wastewater treatment facility for buildout conditions in 2045 is estimated to be $35,295,000. The growth-allocable portion of the project was estimated by determining the percentage increase in EDUs over the planning period. The increase in EDUs is 114, representing an increase of 5.1%. Therefore, the estimated percentage of project costs attributed to growth is 5.1%, or $1,800,045.

The improvement fee unit cost is calculated by dividing the improvement fee cost basis ($1,800,045) by the anticipated growth through buildout (114 EDUs), resulting in an improvement fee unit cost of **$15,790 per EDU**. This SDC rate is for the improvements for the wastewater treatment plant only and will need to be added to the existing SDC rates if the District chooses to implement these additional SDC's.

The District has already employed an SDC schedule methodology for their existing SDC rates. This methodology is based upon meter size which generally corresponds to the amount of water that will be used by each connection. Single family homes, which represent one EDU, are typically served by a ¾" meter. The equivalent dwelling units associated with each meter size is based upon the ratio of the SDC fee compared to the SDC fee for a single EDU. This EDU ration is then multiplied by the single EDU SDC rate for the new wastewater treatment plant improvements for each meter size. The SDC schedule calculated for new wastewater treatment plant improvement is shown below in TABLE 06-9

TABLE 06-2: NEW WWTF SDC SCHEDULE

Proposed Wastewater Treatment Plant SDC Schedule		
Meter Size	**SDC Fee**	**EDU's**
¾" Meter	$15,970.00	1.0
1" Meter	$39,155.22	2.5
1 ½" Meter	$77,801.20	4.9
2" Meter	$124,174.60	7.8
3" Meter	$247,836.99	15.5
4" Meter	$386,957.19	24.2

09.4 Wastewater Plant Improvements Rate Impacts

The information presented in the preceding sections has been used to develop a probable rate adjustment for the District based on the recommended wastewater treatment project. To proceed with the recommended project, the District will need to secure funding. Some grant funding may be available to the District; however, loans or the use of available cash reserves may be required for a significant portion of the cost. The final user rate will depend on the funding package secured by the District including interest rates, current construction costs, and other variables. TABLE 06-10 and TABLE 06-11 provide a summary of the potential rate impacts the proposed wastewater treatment plant project may have. **Error! Reference source not found.** shows the annual Operation and Maintenance cost per EDU for a new wastewater treatment facility.

TABLE 06-3: ANNUAL OPERATING COSTS PER EDU

O&M Costs	
Annual Operating Cost:	$217,600
Number of EDUs (Current)	2221
Monthly O&M Cost per EDU	**$8.16**

TABLE 06-11 shows a series of potential funding scenarios depending upon the financing methodology and the impact to user rates. It may be possible, and advantageous, to combine multiple funding programs in order to leverage the most grant and/or loan forgiveness funds available. The following criteria were used in the user rate calculations:

- Connections = 2221
- Loan Interest Rate = 1.42%
- Loan Period = 30-years
- Estimated Project Costs: $35,295,000
-

TABLE 06-4: WATER TREATMENT PLANT FINANCING COSTS

Project Financing	100% Loan, No Grant	50% Loan	30% Loan
Capital Cost	$35,295,000	$35,295,000	$35,295,000
Loan Needed	$35,295,000	$17,647,500	$10,588,500
Interest Rate*	1.420%	1.420%	1.420%
Loan Period (yrs)	30	30	30
Annual Annuity	$1,453,043	$726,521	$435,913
Monthly Income Required	$121,087	$60,543	$36,326
Monthly Income Reqd' w/ 10% reserve	$133,196	$66,598	$39,959
Number of EDUs (Current)	2221	2221	2221
Monthly Financing Cost per EDU	**$59.97**	**$29.99**	**$17.99**
Monthly O&M Cost per EDU**	**$8.16**	**$8.16**	**$8.16**
Current Monthly WW Base Fee	$54.00	$54.00	$54.00
New Monthly Wastewater Fee	**$122.14**	**$92.15**	**$80.16**

*https://w w w .oregon.gov/deq/w q/cw srf/Pages/CWSRF-Rates.aspx (as of December 2, 2022)

** Activated sludge w /4 operators

09.5 Total Wastewater Improvements Rate Impacts

The 2018 Facilities Plan Update prepared by HHPR. (Harper Houf Peterson Righellis, Inc., 2018) has identified several capital improvement projects needed in the collection system that remain to be completed. TABLE 06-12 shows the probable user impact based on completing all the recommended collection system improvements combined with a new wastewater treatment plant.

TABLE 06-5: COMBINED WWTP AND COLLECTION SYSTEM CIP COSTS

Project Financing	100% Loan, No Grant	50% Loan	30% Loan
Capital Cost	$39,815,000	$39,815,000	$39,815,000
Loan Needed	$39,815,000	$19,907,500	$11,944,500
Interest Rate*	1.420%	1.420%	1.420%
Loan Period (yrs)	30	30	30
Annual Annuity	$1,639,124	$819,562	$491,737
Monthly Income Required	$136,594	$68,297	$40,978
Monthly Income Reqd' w/ 10% reserve	$150,253	$75,127	$45,076
Number of EDUs (Current)	2221	2221	2221
Monthly Financing Cost per EDU	**$67.65**	**$33.83**	**$20.30**
Monthly O&M Cost per EDU**	**$8.16**	**$8.16**	**$8.16**
Current Monthly WW Base Fee	$54.00	$54.00	$54.00
New Monthly Wastewater Fee	**$129.82**	**$95.99**	**$82.46**

0.10 Next Steps

Now that the Facility Plan has been completed, the District can begin taking steps toward implementing the project. Elemental steps to implementing a successful large value project include outreach, financing, and project planning. These three tasks are interwoven but must each be successfully planned and implemented to allow the project to move forward as efficiently as possible.

10.1 Outreach

Outreach may be the most important task at this point in the project. The Facilities Plan may have identified potential solutions, sites and costs but this information needs to be communicated to rate payers, local and state officials, permitting agencies, funding agencies, and the press.

- **Official adoption of the Facility Plan by the GSD Board**

  The Board will need to officially adopt the Facility Plan at a regular Board Meeting and it is recommended to do so in a Public Hearing format. In accordance with Public Hearing notification rules, the District should advertise the meeting to the rate payers through utility billings and other means. The advertisement should inform rate payers that the Board is considering the adoption of the Plan, describe the general content and conclusions of the plan, and invite people to attend the meeting to provide feedback or provide feedback via email or in writing to be submitted at the meeting for consideration. The Facility Plan document is very large, so the District will need to make provisions for members of the public to download the document from the District's website and have a hard copy available at the desk for public viewing. Adopting the Facility Plan at an advertised Public Hearing where public feedback is solicited and considered is an important and necessary step when pursuing public funding sources.

- **Establish a webpage where project documents can be accessed.**

  To maintain continuity and efficiency of the outreach effort, a portion of the GSD web page should be dedicated to the project and serve as a location where documents can be accessed and downloaded and the District can communicate the message that they want to convey regarding the project. The webpage should include a link for the public to provide comments and/or pose questions during the process. It is likely that hundreds of people will be touched during the outreach process for this project. The web page will provide easy access for rate payers, Legislators and other officials, and the press to acquire information and documents that may be necessary and timely for their work.

- **Submit Facility Plan to DEQ for review and comment.**

  DEQ does not require a Facility Plan to be completed and the document is primarily to satisfy the funding agencies that the applicant has done due diligence to ensure the project is feasible and cost effective. However, portions of the analysis completed as part of the facility plan are required by DEQ before they will issue a permit for construction. It is advised that the District send the Facility Plan to DEQ for their review then request an in-person meeting to discuss the plan and next steps to advance the project.

- **Meet with local Legislators to discuss the project and request support.**

  The District should schedule a meeting with State Representative David Gomberg, State Senator Dick Anderson, and County Commissioner Kaety Jacobsen to inform them of the project need, status and costs, and request support from them in securing funding and advocating the project.

10.2 Financing

The District can take many steps to advance the project without immediate financing, but the critical path to project completion with be acquiring funds.

- **Schedule One Stop Meeting With Financing Agencies**

  Constructing a new wastewater treatment plant is an expensive endeavor and can be overwhelming, particularly for a small system like GSD. Therefore, it is necessary to self-advocate and develop project partners to help secure stable funds. Financing may include several steps and various funding sources. The District has to pay for the total project costs, but will also need to have available cash to pay invoices for design and construction. This cash flow may be accommodated by a line of credit through a traditional bank, provided by District cash reserves, or funded through a bridge loan from one of the various funding agencies.

  The District should schedule a One Stop meeting with funding agencies, which will include at a minimum the US Department of Agriculture (USDA), OR Department of Environmental Quality (DEQ), Business Oregon, Rural Community Assistance Corporation (RCAC) and Regional Solutions. Typically, the one-stop can be scheduled with the Business Oregon regional representative who on the Central Oregon Coast is Melissa Murphy ((503) 983-8857; Melissa.Murphy@oregon.gov).

- **Request meeting with Mid-Coast Regional Solutions Team**

  Regional Solutions is part of the Governor's office. The Regional Solutions Program approaches community and economic development by recognizing the unique needs of each region in the state and working at the local level to identify priorities, solve problems, and seize opportunities to get specific projects completed. The following link is an overview of the Regional Solutions Program: https://www.oregon.gov/gov/regional-solutions/Documents/RegSol%20Program%20Overview%20FINAL.pdf

  The Mid-Coast Regional Solutions Team is comprised of representatives from Business Oregon, DEQ, Housing and Community Services, Department of Land Conservation and Development (DLCD), Oregon Department of Transportation (ODOT), and the Department of State Lands (DSL). Representatives from this group are often the same representative that will support the District in a one-stop meeting. However, Regional Solutions also has representatives that can provide guidance and advocacy with aspects of the project beyond funding including permitting and land use.

  The District should request that the Regional Solutions Team add the Gleneden Sanitary District Wastewater Treatment Plant Project as a project of regional significance to the Regional Solutions Workplan. This action will show other legislators and funding agencies the importance and priority of the project to the Governor's office and make the project eligible for Regional Solutions funding.

10.3 Planning

These next step planning tasks will inform the design and provide the design team with clarity regarding what to include in the design process and where project elements will be located.

- **Explore procurement of property for WWTF.**

  The District can begin to engage property owners to inquire about purchasing the land and easement necessary to construct the facility. This will allow the District to identify initial costs and acquire financing specifically for land procurement. Once the land is identified and procured, the District can begin other preliminary design and planning work including geotechnical exploration and survey.

- **Set up a meeting with Oregon State Parks.**

  Regardless of the plant location, an ocean outfall will involve Oregon State Parks since the outfall will cross the beach and many of the logical construction locations for setting up a drilling operation are on State Park owned properties. Since State Parks will be specifically impacted, it is recommended to schedule this meeting before and independently from other permitting agencies, and to include the local representatives that are responsible for managing the impacted parks.

- **Schedule a meeting with agencies that may have permit authority or will be impacted by the project.**

  Agencies that may be included in this meeting include, but may not be limited to, DEQ, DSL, Department of Fish and Wildlife, NOAA Marine Fisheries, ODOT, Oregon State Parks, and Lincoln County Public Works.

- **Conduct additional wastewater sampling to define loading parameters more closely for wastewater process design.**

  The wastewater samples collected to date are too limited to provide reasonable assessment of seasonal loading. It is recommended to implement a sampling program that tracks loading over an entire year.

- **Start preliminary design.**

  The above steps influence the design of the project by developing concurrence among stakeholders with the planned improvements, identifying funding sources and cash flow, helping the design team understand permit requirements that may influence design, and finalizing the project site. It is recommended that the District follow through on the above steps before beginning preliminary design. Once the design team has confidence that permitting agencies will permit the project, the project site is secured, and financing is available to pay for design, then the District should begin the design process immediately to prevent undue delays in meeting the 2027 project completion target. Initial tasks will include geotechnical evaluation of the site, outfall alignment and forcemain alignment and survey of the same locations.

0.11 References

Business Oregon, USDA, RCAC, DEQ. (2019). *Preparing Wastewater Planning Documents and Environmental Reports for Public Utilities.*

DEQ, O. (1996). *Guidelines for Making Wet-Weather and Peak Flow Projections for Sewage Treatment in Western Oregon.*

Engineering New Record. (2023, January 31). *Construction Cost Index History - Annual Average.* Retrieved from Engineering News Record: https://www.enr.com/economics/historical_indices/construction_cost_annual_average

EPA, U. (1974). *Design Criteria for Electrical, Mechanical, and Fluid Sysytems and Component Reliability (EPA-430-99-74-001).*

Harper Houf Peterson Righellis, Inc. (2018). *Gleneden Sanitary District Wastewater Collection System Facilities Plan Update.*

Harper Houf Peterson Righellis, Inc. (2018). *Gleneden Sanitary District Wastewater Collection System Facilities Plan Update.*

Harper Houf Peterson Righellis, Inc. (2020). *Analysis of Wastewater Options, Phase 1.*

Mabarex Technologies. (2023, 1 31). *Mabarex Water Treatment Solutions.* Retrieved from https://www.mabarex.com/en/secteurs/municipalities

Metcalf & Eddy, A. (2014). *Wastewater Engineering; Treatment and Resource Recovery, 5th Edition.* McGraw-Hill, Inc.

National Fire Prevention Association. (2020). *Standard for Fire Protection in Wastewater Treatment and Collection Facilities.*

OR DEQ. (2001). *Antidegradation Policy Implementation, Internal Management Directive.*

OR DEQ. (2018). *National Pollutant Discharge Elimination System: Permit Evaluation Report and Fact Sheet.*

OR DEQ. (2022). *Oregon’s 2022 Integrated Report, Section 303(d) List of Category 5 Water Quality Limited Waters Needing a TMDL.*

Oregon Department of Environmental Quality. (2021). *Oregon Standards for Design and Construction of Wastewater Pump Stations.*

Oregon DEQ. (n.d.). *Guidelines for Making Wet-Weather and Peak Flow Projections for Sewage Treatment in Western oregon: MMDWF, MMWWF, PDAF, and PIF.*

PSU. (2021). *Proposed Coordinated Forecasts for Lincoln County, its Urban Growth Boundaries (UGBs), and the Area Outside UGBs.* Portland State University.

U.S. Census Bureau. (2021, May 20). *Total Population; 2010: DEC Summary File 1; Table P1; Lincoln Beach CDP, Oregon*. Retrieved from https://data.census.gov/cedsci/table?g=1600000US4142550&tid=DECENNIALSF12010.P1

US Environmental Protection Agency. (1973). *Design Criteria for Mechanical, Electric, and Fluid Systems and Component Reliability (EPA-430-99-74-001).*

Water Environment Federation. (2018). Design of Water Resource Recovery Facilities, Sixth Edition. New York: McGraw-Hill Education.