



**Town of Discovery Bay
Community Services District**
Wastewater Master Plan Update

Prepared for:

Town of Discovery Bay

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20.0 REHABILITATION AND IMPROVEMENT OF PLANT 1

The previous Master Plan Amendment 3, dated March 2016, was developed to address the future use of Plant 1. In this section, the analysis and results from that investigation are summarized and an updated evaluation of Plant 1 improvements is presented.

20.1 SUMMARY OF PREVIOUS MASTER PLAN AMENDMENT 3

In the previous Master Plan Amendment 3, three major alternatives for Plant 1 were evaluated as follows:

Alt. 1: Rehabilitate the existing oxidation ditch and clarifiers, including structural repairs and new mechanical equipment, replace existing MCC-C, and correct additional deficiencies.

Alt. 2: Rehabilitate the existing oxidation ditch, including structural repairs and new mechanical equipment, construct two new clarifiers with modern features, replace existing MCC-C, and correct additional deficiencies.

Alt. 3: Replace the existing Plant 1 secondary treatment facilities with new facilities located at Plant 2.

Amendment 3 to the previous Master Plan is included in this Master Plan as Appendix X. Capital and annual costs for all three alternatives were developed and are summarized in Table 20-1 (a copy of Table A3-4 from Amendment 3, with costs in 2016 dollars). Based on the costs in Table 20-1 and other considerations, Alternative 1 was recommended for implementation.

Table 20-1 Alternative Overall Cost Comparison

Item	Cost, \$1,000's (a)		
	Alt. 1	Alt. 2	Alt. 3
	Rehab Plant 1	Rehab Plant 1 and Replace Clars	Replace Plant 1 Facilities at Plant 2
Capital Cost	3,973	6,989	13,816
Incremental Annual O&M Cost (b)	58	58	0
Present Worth of Annual O&M Cost (c)	863	863	0
Total Present Worth	4,894	7,910	13,816

(a) First quarter 2016 cost level, ENR 20-Cities CCI = 10,200.

(b) Incremental cost above least cost alternative.

(c) 20 years at 3%, Present Worth Factor = 14.8775.



20.1 UPDATED EVALUATION OF PLANT 1 IMPROVEMENTS

Based on the analysis presented in Section 11, Plant 2 alone will likely not be able to handle critical design peak flow and load conditions in cold winter months and with the design SVI of 175 mL/g. Therefore, it likely will be necessary to operate Plant 1 in these conditions. Additionally, Plant 1 will be required to operate when it is necessary to take an oxidation ditch at Plant 2 out of service for major maintenance or repairs. Accordingly, Plant 1 must remain in operable condition, even if it is not actually operated in most years. Therefore, many of the recommendations for rehabilitation of Plant 1 developed in the previous Master Plan Amendment 3 are still appropriate. However, if it is considered that Plant 1 is mostly a backup to Plant 2 and will be operated only infrequently and mostly in future years as flows and loads approach the buildout condition, some of the previously recommended improvements can be considered as non-essential and can be deferred until such time (if ever) as the District determines it would be cost-effective to implement these improvements. Additionally, some of the previously recommended improvements have already been completed.

In Table 20-2, the improvements recommended in the previous Master Plan Amendment 3 are listed together with the previously estimated costs in 2016 dollars. The improvements are then categorized in subsequent columns to indicate whether they have already been completed and, if not, whether they are considered essential or non-essential. For the essential and non-essential future improvements, updated costs in 2019 dollars are indicated. Also shown in Table 20-2 and categorized as essential and non-essential are improvements that were not listed in the previous Master Plan Amendment 3 but have been identified for this Master Plan update by the District Engineer working with the plant operations Project Manager. For the convenience of having all Plant 1 improvements listed in one place, the anoxic basins and related facilities at Plant 1 needed for meeting new permit limits for nitrate+nitrite-nitrogen and developed in detail in Section 11 are included in Table 20-2.



TOWN OF DISCOVERY BAY COMMUNITY SERVICES DISTRICT

Rehabilitation and Improvement of Plant 1

Table 20-2 Plant 1 Improvements

Item	2016 Cost (a), \$1000s	Completed?	2019 Cost (b), \$1000s		Comment
			Essential	Non-Essential	
Items in Previous Master Plan Amendment 3					
Influent Pump Station Area Misc. Improvements	40	Partly	10	---	Grating not completed.
Influent Pump Station and Pump Sta W Standby Power	200	Yes	---	---	
Oxidation Ditch Structural Rehab and Guardrail Repair	500	No	554	---	
Oxidation Ditch Rotor and Sump Pump Replacement	360	Yes	---	---	
Clarifiers Structural Rehab	50	No	55	---	Injection grouting of cracks
Clarifiers Mechanical Replacement and Upgrade	540	No	598	---	Mechanisms, launder covers, density baffles
MCC-C Replacement	250	No	277	---	
MCC-C Standby Power	150	No	166	---	
Headworks New Odor Control System	80	Yes	---	---	
Headworks Grating, Instrumentation, and Misc.	25	Partly	28	---	Grating not completed. Cost estimate increased.
Clarifier 2 Lift Station Instrumentation and Controls	50	Yes	---	---	
Clarifier 1 and 2 RAS Pumps and Check Valves Replacement	180	No	---	199	
WAS Pumps and Check Valves Replacement	64	No	---	71	
Storm Drainage Improvements	10	No	25	---	Cost estimate increased.
Transfer Station Instrumentation and Controls	50	Partly	25	---	
Demolish Existing Abandoned Facilities	100	No	---	111	
Additional Items					
Extend Pump Sta. F Forcemain to Pump Sta. W Manhole			25	---	
Coat Electrical Cabinets at Influent Pump Sta.			5	---	
Pump Sta. W Isolation Valve			20	---	
Oxidation Ditch Rotor Frame Elect. and Struct. Rehab.			400	---	
Subtotal 1	2,649		2,188	381	
Contingencies @ 20%	530		438	76	
Subtotal 2	3,179		2,626	457	
Engineering, Admin, and Environmental @ 25%	795		657	114	
Total without Anoxic Basins and Related Anoxic Basins and Related (c)	3,974		3,283	571	
Total with Anoxic Basins and Related	---		2,619	---	
	3,974		5,902	571	

(a) First quarter 2016 cost level, ENR 20-Cities CCI = 10,200.

(b) Mid-2019 cost level, ENR 20-Cities CCI = 11,300.

(c) From Section 11, including contingencies, engineering, administration, and environmental.



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Rehabilitation and Improvement of Plant 1

