



Preserve Lift Station Fee Study Report

Raftelis Financial Consultants, Inc. (Raftelis) is pleased to present this report on the lift station fee study to the City of Chino (City). The City engaged Raftelis to calculate fees for wastewater customers served by the Preserve Sewer Lift Station. The facility is scheduled for completion in June 2018, with the City assuming responsibility for operations, maintenance, and capital replacement by the end of 2018. The City wishes to calculate a fee to be included as a surcharge on the wastewater bills of customers served by the lift station. The fee should fully recover the costs of operating and maintaining the facility, including the costs of replacing facility components at the end of their useful lives. Finally, the City wishes to establish a new Lift Station Reserve Fund to manage and collect interest on fee revenues, and to pay for capital replacement projects.

For this study, we reviewed the operating and capital costs of the lift station, as well as customer data and expected customer growth, to determine a fair and equitable fee. We developed a long-range financial plan and cash flow model for the proposed lift station reserve fund that will be used to finance the replacement of the lift station facilities in the future. Raftelis evaluated data provided by the City to develop a fee that supports the lift station for the next 50 fiscal years (FY 2018 - 2067).

Data & Key Assumptions

We made several assumptions on cost increases due to inflation as shown below. Growth in the accounts was based on the increases in the Preserve, increasing by approximately 300 units per year or 9% per year until the maximum of 11,950 units are built. Flows from Prado Park and California Institution of Women (CIW) are estimated to remain at current levels. Reserve interest rates start at 1.5% and are estimated to increase by 0.25% per year and level off at 3%.

Account Growth	9.0%
Usage Growth	0.0%
Capital Inflation Factor	4.0%
O&M Inflation: Electricity	5.0%
O&M Inflation: Parts & Labor	3.0%
Reserve Interest Rate	1.50%

Flows and EDUs

The flows from Prado Park and CIW are expected to remain constant through the next 50 years, however, The Preserve flows will increase with increase in the housing units until buildout. The growth in accounts and flows are shown in **Table 1** below. Buildout occurs in 2033 and flows remain constant after that. The total flow from the Preserves in FY 2017 is 166.95 million gallons (MG) from 2,017 single family residences (SFR) and 1,049 multi-family residences (MFR). The flow from each MFR dwelling unit is 70% of that from SFR dwelling units based on the *Water and Wastewater Cost of Service Study* dated August 5, 2015. This translates to 2,751 EDUs for the Preserves in 2017. 5,057 gal/EDU/mo as follows:

$$2017 + 1049 * 70\% = 2,751 \text{ EDUs}$$

$$166,950,400 / 2,751 / 12 = 5,057 \text{ gal/EDU/mo}$$

Using this definition on the total flow gives us in the last column of Table 1, the total number of EDUs served.

TABLE 1: TOTAL FLOWS AND EDUS

	Total Occupancies Granted	Prado Park Annual Flows (Gal)	CIW Annual Flows (Gal)	Preserve Annual Flows (Gal)	TOTAL Annual Flows (Gal)	Average Flow Rate (GPD)	Flow Rate (MGD)	Gal/EDU/mo	Total EDUs Served
FY 2015		1,426,710	129,771,700	122,625,400	253,823,810	695,408	0.70		
FY 2016		1,306,690	126,780,000	125,906,700	253,993,390	695,872	0.70		
FY 2017	3,066	1,098,890	104,770,000	166,950,400	272,819,290	747,450	0.75	5,057	4,496
FY 2018	3,342	1,098,890	104,770,000	181,975,936	287,844,826	788,616	0.79		4,744
FY 2019	3,643	1,098,890	104,770,000	198,353,770	304,222,660	833,487	0.83		5,014
FY 2020	3,971	1,098,890	104,770,000	216,205,610	322,074,500	882,396	0.88		5,308
FY 2021	4,328	1,098,890	104,770,000	235,664,114	341,533,004	935,707	0.94		5,628
FY 2022	4,717	1,098,890	104,770,000	256,873,885	362,742,775	993,816	0.99		5,978
FY 2023	5,142	1,098,890	104,770,000	279,992,534	385,861,424	1,057,155	1.06		6,359
FY 2024	5,605	1,098,890	104,770,000	305,191,862	411,060,752	1,126,194	1.13		6,774
FY 2025	6,109	1,098,890	104,770,000	332,659,130	438,528,020	1,201,447	1.20		7,227
FY 2026	6,659	1,098,890	104,770,000	362,598,452	468,467,342	1,283,472	1.28		7,720
FY 2027	7,258	1,098,890	104,770,000	395,232,312	501,101,202	1,372,880	1.37		8,258
FY 2028	7,912	1,098,890	104,770,000	430,803,221	536,672,111	1,470,335	1.47		8,844
FY 2029	8,624	1,098,890	104,770,000	469,575,510	575,444,400	1,576,560	1.58		9,483
FY 2030	9,400	1,098,890	104,770,000	511,837,306	617,706,196	1,692,346	1.69		10,180
FY 2031	10,246	1,098,890	104,770,000	557,902,664	663,771,554	1,818,552	1.82		10,939
FY 2032	11,168	1,098,890	104,770,000	608,113,904	713,982,794	1,956,117	1.96		11,766
FY 2033	11,950	1,098,890	104,770,000	650,681,877	756,550,767	2,072,742	2.07		12,468
FY 2034	11,950	1,098,890	104,770,000	650,681,877	756,550,767	2,072,742	2.07		12,468
FY 2067	11,950	1,098,890	104,770,000	650,681,877	756,550,767	2,072,742	2.07		12,468

Sources: *Prado Park Monthly Flows.xlsx*, *Copy of CIW Monthly Flows.xlsx*, *Copy of Chino Preserve Development Flow.xlsx*

Operating Costs

O&M costs include two components: the electricity (power) needed to operate the lift station, and the parts & labor needed on an ongoing basis to staff and service the facility (note that the operating parts & labor expenses are separate from capital replacement costs). Power costs are expected to remain at the startup level until the startup flow is reached and then interpolated linearly with flow between the startup, 50%, 75% and 100% design flows. Projections for parts and labor costs are

pegged to the design capacity under which they fall. For example, a flow of 1 mgd would incur a Parts and Labor cost of \$29,500 and a flow of 2.5 mgd would incur a cost of \$32,450 uninflated. This is the result of the facilities required once they cross the various thresholds. **Table 2** shows estimated total costs as well as unit costs for the two O&M components, at various levels of flow. These figures are based on the engineering report provided by the City.

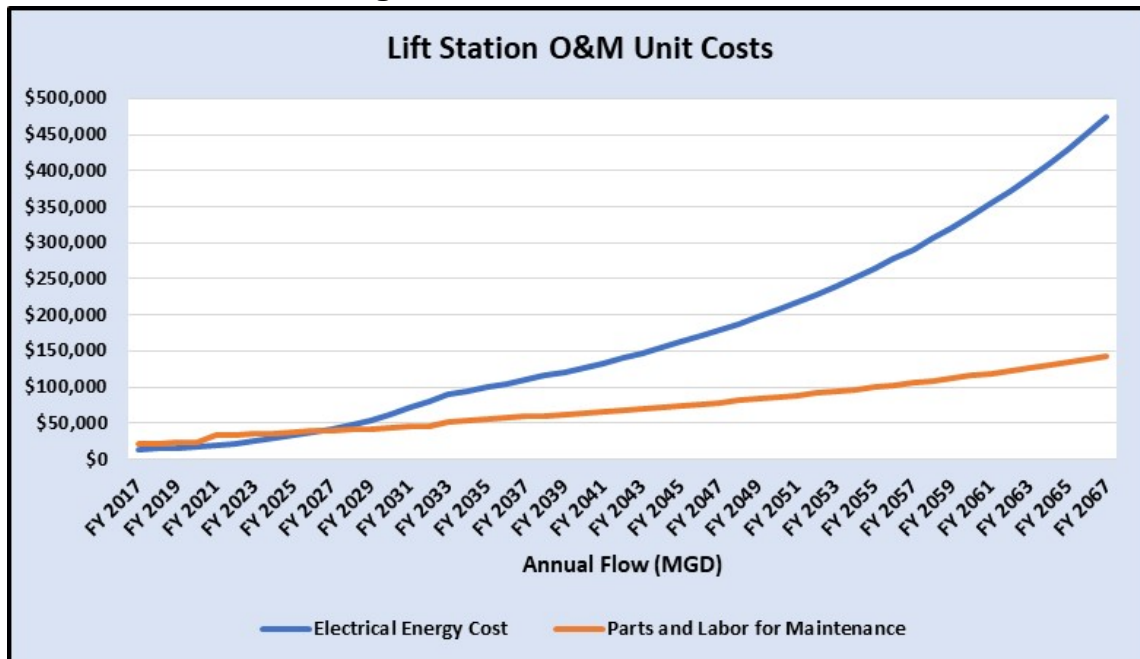
Table 2 – O&M Costs

Design Cap Assumption	Flow (MGD)	Electricity Costs	Parts & Labor	Electricity per MGD	Parts & Labor per MGD
Start Up Flow	0.9	\$14,900	\$21,240	\$16,556	\$23,600
50% Design Cap	2.0	\$39,600	\$29,500	\$19,800	\$14,750
75% Design Cap	3.0	\$62,700	\$32,450	\$20,900	\$10,817
100% Design Cap	4.0	\$99,100	\$35,400	\$24,775	\$8,850

Source: Lift Station O&M cost 11.17.17.xlsx

Using the City’s cost estimates, we estimate unit cost curves for each component, assuming a linear change between each of the points provided. **Figure 1** shows the inflated unit costs for electricity and parts & labor over the 50 years. Note that we assume that the costs provided for Start Up Flow are the minimum costs needed to run the lift station; therefore, we hold these costs constant for all flow levels below 0.9 million gallons per day (MGD). At levels above 0.9 MGD we assume a linear change between each level of design capacity.

Figure 1 – O&M Unit Costs Inflated



Capital Costs

In addition to O&M costs, the City is planning to fund the replacement costs of infrastructure for the lift station. The facility’s capital components have specific useful lives before they must be replaced.

Therefore, we categorize capital projects by useful life to determine the total capital replacement costs over the 50-year study timeline.

Table 3 shows the capital replacement costs before and after we apply inflation assumptions. The City provided nominal costs of each project group in 2017 dollars. 15-Yr Projects occur in years 15, 30, and 45; the 28-Yr Project occurs in year 28 and year 56; and the 50-Yr Project occurs in year 50. To estimate the actual capital expenditures after inflation, we apply a capital inflation factor of 4% compounded annually to all project groups. This is the amount the City will spend to replace capital infrastructure, in real dollars, over the next 50 years.

Since the capital costs will be incurred only periodically, the revenues collected to provide for replacement of the capital facilities will be accumulated in a reserve which earns interest. Therefore, the effective expenditure in capital costs would be reduced by the interest earnings. At the end of the 50-year period, there should be sufficient reserves to continue to fund future capital expenditures. The first such expenditure after the 50-years will be the 28-year project facilities which will cost \$10.2 million in year 56.

Table 3 - Capital Replacement Costs

Cost of Capital Projects (2017 Dollars)	
15-Yr Projects	\$169,500
28-Yr Projects	\$1,139,000
50-Yr Projects	\$1,757,800
Inflated Total (Actual Capital Expenditures)	
15-Yr Projects	\$2,429,911
28-Yr Projects	\$3,415,523
50-Yr Projects	\$12,492,128

Source: *Preserve Chino Sewer Lift Station Replacement Cost Technical Memo 11.17.17*

FEE CALCULATION

To determine the fee to be charged per EDU, we develop the cash flow with projected expenses and revenues at an assumed rate. There should be adequate funds available in the reserve at the end of 50 years to ensure that the next capital expenditure can be financed from the reserve. By trial and error, a fee of \$2.45 per EDU for an SFR and \$1.72 per MFR starting in FY 2018 and increasing by 2% per year provides adequate revenues to finance the capital expenditures and leave enough in the reserves for future capital expenditures. The 2% inflation in fees is below the general inflation of 3% used in the study to ensure that we don't afoul of Proposition 218. The cash flow showing the fees per EDU, revenues collected expenses and reserves are shown in **Table 4**.

The fee calculated is reasonable and will provide sufficient revenues to cover future capital expenses. However, this analysis is based on several assumptions about growth, inflation and interest rates which may change over time. The analysis should therefore be reviewed every few years.

Table 4 – Lift Station Financial Plan and Reserve Fund Balance

	EDUs	Monthly Fee, \$/EDU	Revenues from Fee	O&M Expenses	Capital Replacement	Total Expenditures	NET CASH FLOW	Lift Station Replacement Reserve		
								Beginning Balance	Interest	Ending Balance
FY 2018	4,744	\$2.450	\$139,462	\$37,300	\$0	\$37,300	\$102,163	\$0	\$766	\$102,929
FY 2019	5,014	\$2.500	\$150,405	\$37,747	\$0	\$37,747	\$112,659	\$102,929	\$2,787	\$218,374
FY 2020	5,308	\$2.550	\$162,416	\$40,121	\$0	\$40,121	\$122,295	\$218,374	\$5,590	\$346,260
FY 2021	5,628	\$2.600	\$175,605	\$52,703	\$0	\$52,703	\$122,902	\$346,260	\$9,173	\$478,336
FY 2022	5,978	\$2.650	\$190,097	\$55,946	\$0	\$55,946	\$134,152	\$478,336	\$13,635	\$626,123
FY 2023	6,359	\$2.700	\$206,028	\$60,198	\$0	\$60,198	\$145,830	\$626,123	\$19,224	\$791,177
FY 2024	6,774	\$2.760	\$224,361	\$64,853	\$0	\$64,853	\$159,507	\$791,177	\$26,128	\$976,812
FY 2025	7,227	\$2.810	\$243,689	\$69,979	\$0	\$69,979	\$173,710	\$976,812	\$31,910	\$1,182,431
FY 2026	7,720	\$2.870	\$265,884	\$75,068	\$0	\$75,068	\$190,816	\$1,182,431	\$38,335	\$1,411,583
FY 2027	8,258	\$2.930	\$290,352	\$81,380	\$0	\$81,380	\$208,972	\$1,411,583	\$45,482	\$1,666,037
FY 2028	8,844	\$2.990	\$317,331	\$88,402	\$0	\$88,402	\$228,928	\$1,666,037	\$53,415	\$1,948,381
FY 2029	9,483	\$3.050	\$347,084	\$96,240	\$0	\$96,240	\$250,844	\$1,948,381	\$62,214	\$2,261,439
FY 2030	10,180	\$3.110	\$379,904	\$105,012	\$0	\$105,012	\$274,892	\$2,261,439	\$71,967	\$2,608,297
FY 2031	10,939	\$3.170	\$416,111	\$115,410	\$0	\$115,410	\$300,701	\$2,608,297	\$82,759	\$2,991,758
FY 2032	11,766	\$3.230	\$456,060	\$126,479	\$305,260	\$431,739	\$24,321	\$2,991,758	\$90,118	\$3,106,196
FY 2033	12,468	\$3.300	\$493,723	\$142,370	\$0	\$142,370	\$351,354	\$3,106,196	\$98,456	\$3,556,006
FY 2034	12,468	\$3.360	\$502,700	\$148,447	\$0	\$148,447	\$354,254	\$3,556,006	\$111,994	\$4,022,254
FY 2035	12,468	\$3.430	\$513,173	\$154,796	\$0	\$154,796	\$358,377	\$4,022,254	\$126,043	\$4,506,674
FY 2036	12,468	\$3.500	\$523,646	\$161,431	\$0	\$161,431	\$362,215	\$4,506,674	\$140,633	\$5,009,523
FY 2037	12,468	\$3.570	\$534,119	\$168,365	\$0	\$168,365	\$365,754	\$5,009,523	\$155,772	\$5,531,049
FY 2038	12,468	\$3.640	\$544,592	\$175,611	\$0	\$175,611	\$368,981	\$5,531,049	\$171,466	\$6,071,496
FY 2039	12,468	\$3.710	\$555,065	\$183,184	\$0	\$183,184	\$371,881	\$6,071,496	\$187,723	\$6,631,100
FY 2040	12,468	\$3.790	\$567,034	\$191,100	\$0	\$191,100	\$375,934	\$6,631,100	\$204,572	\$7,211,607
FY 2041	12,468	\$3.860	\$577,507	\$199,374	\$0	\$199,374	\$378,133	\$7,211,607	\$222,020	\$7,811,760
FY 2042	12,468	\$3.940	\$589,476	\$208,023	\$0	\$208,023	\$381,453	\$7,811,760	\$240,075	\$8,433,288
FY 2043	12,468	\$4.020	\$601,445	\$217,065	\$0	\$217,065	\$384,380	\$8,433,288	\$258,764	\$9,076,431
FY 2044	12,468	\$4.100	\$613,414	\$226,519	\$0	\$226,519	\$386,895	\$9,076,431	\$278,096	\$9,741,423
FY 2045	12,468	\$4.180	\$625,383	\$236,403	\$3,415,523	\$3,651,926	-\$3,026,543	\$9,741,423	\$246,845	\$6,961,724
FY 2046	12,468	\$4.260	\$637,352	\$246,739	\$0	\$246,739	\$390,613	\$6,961,724	\$214,711	\$7,567,048
FY 2047	12,468	\$4.350	\$650,817	\$257,546	\$615,102	\$872,648	-\$221,831	\$7,567,048	\$223,684	\$7,568,902
FY 2048	12,468	\$4.430	\$662,786	\$268,848	\$0	\$268,848	\$393,938	\$7,568,902	\$232,976	\$8,195,816
FY 2049	12,468	\$4.520	\$676,251	\$280,668	\$0	\$280,668	\$395,583	\$8,195,816	\$251,808	\$8,843,208
FY 2050	12,468	\$4.610	\$689,717	\$293,030	\$0	\$293,030	\$396,686	\$8,843,208	\$271,247	\$9,511,141
FY 2051	12,468	\$4.710	\$704,678	\$305,960	\$0	\$305,960	\$398,718	\$9,511,141	\$291,315	\$10,201,173
FY 2052	12,468	\$4.800	\$718,143	\$319,485	\$0	\$319,485	\$398,658	\$10,201,173	\$312,015	\$10,911,846
FY 2053	12,468	\$4.890	\$731,608	\$333,633	\$0	\$333,633	\$397,975	\$10,911,846	\$333,325	\$11,643,146
FY 2054	12,468	\$4.990	\$746,570	\$348,434	\$0	\$348,434	\$398,136	\$11,643,146	\$355,266	\$12,396,548
FY 2055	12,468	\$5.090	\$761,531	\$363,918	\$0	\$363,918	\$397,613	\$12,396,548	\$377,861	\$13,172,021
FY 2056	12,468	\$5.190	\$776,492	\$380,119	\$0	\$380,119	\$396,374	\$13,172,021	\$401,106	\$13,969,501
FY 2057	12,468	\$5.300	\$792,950	\$397,069	\$0	\$397,069	\$395,880	\$13,969,501	\$425,023	\$14,790,405
FY 2058	12,468	\$5.400	\$807,911	\$414,806	\$0	\$414,806	\$393,105	\$14,790,405	\$449,609	\$15,633,119
FY 2059	12,468	\$5.510	\$824,369	\$433,365	\$0	\$433,365	\$391,003	\$15,633,119	\$474,859	\$16,498,981
FY 2060	12,468	\$5.620	\$840,826	\$452,788	\$0	\$452,788	\$388,038	\$16,498,981	\$500,790	\$17,387,809
FY 2061	12,468	\$5.730	\$857,283	\$473,114	\$0	\$473,114	\$384,170	\$17,387,809	\$527,397	\$18,299,375
FY 2062	12,468	\$5.850	\$875,237	\$494,387	\$1,509,550	\$2,003,936	-\$1,128,699	\$18,299,375	\$532,051	\$17,702,727
FY 2063	12,468	\$5.970	\$893,191	\$516,652	\$0	\$516,652	\$376,539	\$17,702,727	\$536,730	\$18,615,995
FY 2064	12,468	\$6.090	\$911,144	\$539,956	\$0	\$539,956	\$371,188	\$18,615,995	\$564,048	\$19,551,231
FY 2065	12,468	\$6.210	\$929,098	\$564,351	\$0	\$564,351	\$364,747	\$19,551,231	\$592,008	\$20,507,986
FY 2066	12,468	\$6.330	\$947,051	\$589,886	\$0	\$589,886	\$357,165	\$20,507,986	\$620,597	\$21,485,748
FY 2067	12,468	\$6.460	\$966,501	\$616,618	\$12,492,128	\$13,108,746	-\$12,142,245	\$21,485,748	\$462,439	\$9,805,942
FY 2068	12,468	\$6.590	\$985,951	\$644,604	\$0	\$644,604	\$341,347	\$9,805,942	\$299,298	\$10,446,587
FY 2069	12,468	\$6.720	\$1,005,400	\$673,904	\$0	\$673,904	\$331,497	\$10,446,587	\$318,370	\$11,096,454
FY 2070	12,468	\$6.850	\$1,024,850	\$704,580	\$0	\$704,580	\$320,270	\$11,096,454	\$337,698	\$11,754,421
FY 2071	12,468	\$6.990	\$1,045,796	\$736,701	\$0	\$736,701	\$309,095	\$11,754,421	\$357,269	\$12,420,786
FY 2072	12,468	\$7.130	\$1,066,742	\$770,333	\$0	\$770,333	\$296,409	\$12,420,786	\$377,070	\$13,094,265
FY 2073	12,468	\$7.270	\$1,087,688	\$805,552	\$10,242,140	\$11,047,692	-\$9,960,004	\$13,094,265	\$243,428	\$3,377,689

CONCLUSION

For this study, Raftelis calculated a fee to recover all costs related to the Preserve Sewer Lift Station. The fee is designed to fully fund O&M and capital replacement without over-collecting money from customers served by the lift station. In addition, we developed a 50-year financial plan for the proposed Lift Station and extended it to year 56 to show that we need reserves at the end of year 50 to finance the 28-year capital project in year 56. Similarly, in year 60 we will need to finance the 15-year project and we need to have adequate reserves to ensure that this project and future projects can be funded from reserves. Based on our current projections, the Reserve Fund should be fiscally solvent for the first 50 years and beyond of the facility's operation. However, because the fee is contingent on inflation assumptions, we recommend the City reevaluate its data to fine-tune the fee every five fiscal years.

For more information, questions or concerns, please contact Raftelis Financial Consultants at 626.583.1894 or spardiwala@raftelis.com.