

San Luis Obispo County Service Area 18 Wastewater Treatment System Capacity Study

January 17, 2025

Executive Summary

This capacity study for County Service Area 18 (CSA 18) was conducted to analyze the current and future wastewater flows and loads of the CSA 18 wastewater treatment system. The purpose of the study is to determine if additional connections would cause a public health and safety risk to the community.

On April 6, 2022, the Central Coast Regional Water Quality Control Board (Central Coast Water Board) issued a notice of intent to enroll CSA 18 into the General Waste Discharge Requirements Order No. R3-2020-0020 (Large System General Permit) for wastewater systems with flows greater than 100,000 gallons per day (gpd) averaged monthly. If the CSA 18 wastewater treatment system becomes regulated pursuant to the Large System General Permit, the existing treatment facility would not be able to meet these daily flow and effluent limits without significant infrastructure improvements.

Alternatively, it would be possible for CSA 18 to be enrolled in the State Water Resources Control Board (State Water Board) Order WQ 2014-0153-DWQ General Waste Discharge Requirements for Small Domestic Wastewater Treatment Systems (Small System General Permit), which has a discharge flow rate limit of 100,000 gpd averaged monthly, among other parameters and requirements. If the CSA 18 wastewater treatment system becomes regulated pursuant to the Small System General Permit, the existing treatment facility would not be able to take more flows and loads without adding more risk to the public health and safety of the community and increasing the likelihood of permit violations and discharge of non-compliant effluent wastewater.

Therefore, additional service connections to CSA 18 are recommended not to be approved until additional treatment capacity is added or other actions are taken to address the increase of flows and loads pursuant to the Small System General Permit.

Sewer Generation Estimates

The CSA 18 Wastewater Treatment Plant accepts wastewater from nearby residential homes, the Los Ranchos Elementary School, and the Country Club Clubhouse. The measurement of sewer generation is described using Dwelling Unit Equivalent (DUE), which is the estimated sewer flows from a single-family dwelling.

Historical usage attributes 11 DUE to Los Ranchos Elementary School and 21.5 DUE to the San Luis Obispo Golf and Country Club Clubhouse. As of January 2025, there are 479.75 DUEs contributing flow to the sewer system, 20.75 DUEs pending development, and 7 vacant parcels. Vacant parcels within CSA 18 are not included in the future DUE estimate of 500.5.

The area surrounding CSA 18 is open land that is mainly used for agricultural purposes. The residential lots within the current service area are generally large and could be developed with accessory dwelling

units (ADUs) or subdivided. The County Planning and Building Department requires will serves for both new residences and ADUs developed in CSA 18. ADUs are estimated to generated 0.75 DUE.

Table 1 - Dwelling Unit Equivalents

Land Use	DUE
Existing Single Family Units	447.25
Country Club Clubhouse	21.5
School	11
Existing DUEs	479.75
Projected DUEsA	20.75
Total Projected DUEs	500.5

^AProjected DUEs include parcels in various stages of the will serve process.

The 1986 agreement between the County and the Country Club states that the Country Club shall provide recycled water disposal for 450 DUEs. If there are more than 450 DUEs contributing to flow, County shall obtain written authorization from the Country Club to accept the effluent. Since the 450 DUE limit has been met, all future DUE increases to CSA 18 would require approval from the Club.

Wastewater Flow Data

Wastewater flows for the past 10 years, 2013 to 2023, were evaluated for this capacity study. Flows are measured at the effluent pump station since the treatment plant does not have an influent flow meter. Flows vary between wet and dry years. Wet weather flows are significantly higher than dry weather flows, indicating issues with inflow and infiltration within the collection system. Since the flows are measured at the effluent, it is believed that the WWTP process buffers peak flows and that peak influent flows are greater.

Table 2 - Historical Annual Flows (gpd)

	Average Daily Flow, gpd	Peak Wet Weather Daily Flow, gpd	Maximum Month Flow, gpd	Average Dry Weather Flow, gpd ^A
2013	65,627	104,000	70,149	64,287
2014	60,187	104,533	69,496	56,552
2015	52,757	92,800	59,014	50,141
2016	53,703	106,378	63,491	51,472
2017	57,030	173,760	86,516	50,723
2018	57,532	148,000	65,000	57,633
2019	47,505	94,000	59,355	42,603
2020	53,055	127,500	60,029	51,341
2021	55,923	200,000	85,726	49,434
2022	58,199	122,300	92,658	51,263
2023	69,876	243,000	111,439	60,288

^A Dry weather consists of the months May to October.

The year 2013 was used to determine the average dry weather flow per connection because it has the highest dry weather flow in the last 10-year period. The average flow per DUE (479.75 existing DUEs) is calculated to be 140 gpd, which is less than the estimated 195 gpd/DUE that was used in the 2005 and 2016 capacity assessments. This can be attributed to water saving fixture units and water conservation.

There are 20.75 planned DUEs to be constructed in CSA 18. Based on the 140 gpd/DUE generation rate, the estimated future average daily flow generated by the additional homes would be 2,905 gpd.

Table 3 - Future Flow Estimates (gpd)

Flow Parameter	Flow
Flow per DUE	140
Average Daily Flow (ADF) of future DUEs	2,905
Max Month Flow (MMF)^A from future DUEs	4,633
Total Future ADFB	72,781
Total Future MMFC	116,072

^A MMF is 1.60 times ADF (111,439/69,876)

^B Maximum average daily flow from last 10 years (2023) plus Future DUE ADF (69,876 + 2,905)

^C Max month flow from last 10 years (2023) plus Future DUE MMF (111,439 + 4,633)

Treatment Capacity

The treatment capacity of the WWTP was analyzed under three different conditions, as shown in Table 4. Condition one, the maximum month flow condition, is based on the Small General Permit's monthly average flow limit of 100,000 gpd. The flow per DUE column is calculated by taking the existing maximum month flow (2023) and dividing it by the existing number of DUEs. The maximum DUE count, shown in the table, is calculated by taking the maximum month flow condition (100,000 gpd) and

dividing it by the calculated flow per DUE (232 gpd). The existing number of DUEs (479.75) exceeds the recommended and maximum DUE number.

The second flow condition is the Peak Day Dry Weather Flow. Using historical influent BOD concentrations, the first order reaction rate calculated based on historical influent and effluent BOD concentrations, and the new permitted BOD limit, the treatment capacity of the WWTP at peak day dry weather flow to meet effluent BOD of 30 mg/L was 125,205 gpd. The recommended capacity was calculated with a 20 percent factor of safety (effluent BOD of 24 mg/L) was 107,261 gpd. The maximum and recommended DUE numbers for this condition, shown in the table, were based on dividing the treatment capacity by flow per DUE (263 gpd for condition number two). The maximum and recommended DUEs are less than the existing and future DUE count in CSA 18.

The peak wet weather flow condition was the third condition evaluated. This condition evaluates the treatment capacity to meet BOD limits under peak day wet weather flow conditions. The peak day wet weather flow and a dilution factor for the influent BOD was used to calculate the maximum flow to meet the 30 mg/L and 24 mg/L effluent BOD limits. The maximum and recommended DUEs are less than the future DUE count in CSA 18.

Under the three conditions evaluated, the maximum DUEs ranged from 420 to 477. The existing number of DUEs contributing flow to the WWTP is 479.75, which exceeds the maximum DUEs for the evaluated conditions. Calculations supporting the values in Table 4 are included in Appendix B.

Table 4 - CSA 18 WWTP Maximum Flow Conditions (gpd)

Condition No.	Condition Reviewed	WWTP Capacity ^A	Recommended WWTP Capacity ^B	Existing Flow Condition ^C	Flow per DUE ^D	Max No. DUEs ^E	Recommended No. of DUEs ^F
1	Max. Month Flow	100,000	-	111,439	234	426	426
2	Peak Day Dry Weather Flow	125,205	107,261	126,000	265	472	405
3	Peak Wet Weather Flow	184,636	155,068	210,667	443	417	350

^A Calculated WWTP capacity based on Condition Reviewed and 30 mg/L BOD.

^B Calculated Recommended WWTP capacity based on Condition Reviewed and 24 mg/L BOD.

^C Existing flow conditions under Condition Reviewed.

^D Flow per DUE based on existing flow condition divided by 479.75 DUE.

^E Max number of DUEs based on WWTP Capacity (30 mg/L BOD).

^F Recommended number of DUEs based on Recommended WWTP Capacity (24 mg/L BOD).

Table 5 - Monthly Average Daily Flow (gpd)

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Jan	70,149	69,496	55,683	63,491	86,516	63,735	54,645	54,397	62071	69106	111439
Feb	64,386	62,148	57,651	50,765	75,039	45,730	59,107	51,607	55125	66607	77336
Mar	66,415	61,928	59,014	59,221	55,083	64,452	54,097	60,029	59868	60516	98306
Apr	66,326	59,804	48,624	49,232	52,781	56,989	41,967	54,120	58753	44933	64873
May	66,548	60,646	50,954	56,439	51,410	53,630	47,419	48,239	51348	49290	59782
Jun	65,415	56,751	51,562	50,502	47,767	57,367	42,767	51,417	53630	43667	70457
Jul	64,161	55,959	48,502	49,870	52,758	54,613	41,516	54,652	29974	43223	60729
Aug	59,967	52,045	48,142	46,839	52,842	59,097	43,645	49,197	42374	52177	56703
Sept	64,632	59,942	52,454	55,095	52,117	65,000	41,034	52,787	52560	61350	52957
Oct	65,043	56,004	51,009	50,174	49,033	56,323	39,172	51,803	66952	57948	61190
Nov	66,761	61,077	54,243	54,002	56,467	59,567	46,700	58,307	52417	56893	57167
Dec	65,503	68,341	57,232	58,427	55,509	52,258	59,355	50,153	85726	92658	67197
Average Annual Daily Flow (gpd)	65,442	60,345	52,922	53,671	57,277	57,397	47,619	53,059	55,900	58,197	69,845

Waste Discharge Permit

On April 6th, 2022, the County received a Notice of Intent from the Central Coast Regional Water Quality Control Board for enrollment into the Small General Waste Discharge Requirements Order No. R3-2020-0020. The Regional Board conducted an inspection of CSA 18 WWTP in July 2023 to complete the permitting process. During the inspection, the County was advised to update their 1986 Title 22 Report prior to permit issuance. The Title 22 Report requires approval by the State Water Resources Control Board Division of Drinking Water and is currently under review. The Regional Board provided the County draft General Permit limits in the interim.

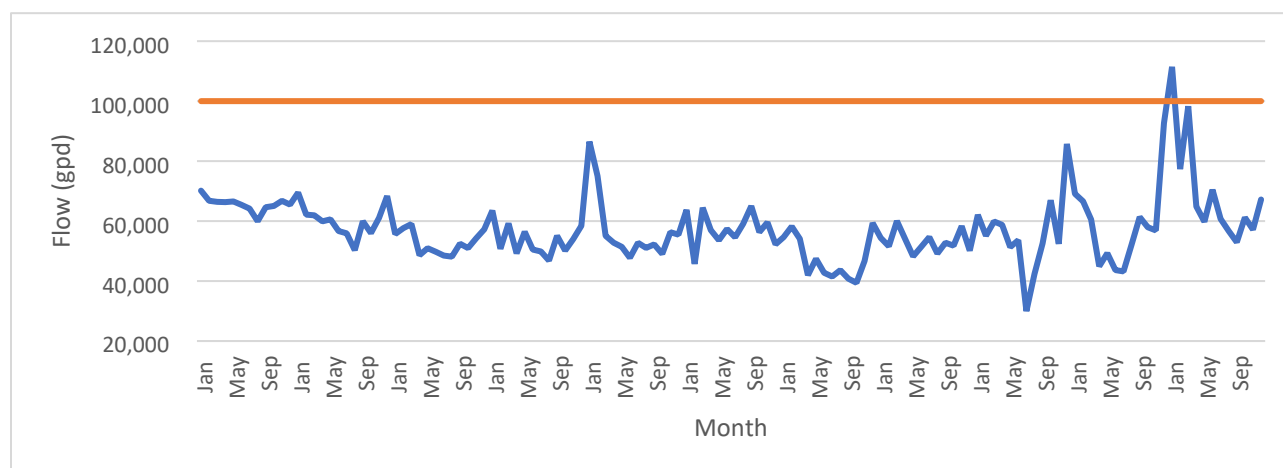
Table 6 – Draft Small General Permit Wastewater Limits

Constituent	Unit	Limit	Point of Compliance
Flow	gpd	100,000 (monthly average)	Influent (IS-1)
Five-Day Biochemical Oxygen Demand (BOD₅)	mg/L	30 (monthly average) 45 (7-day average)	(ES-1) Chlorine Contact Channel Effluent
Total Nitrogen (as N)	% Influent versus Effluent	50% Removal	Effluent (ES-1) compared to Influent (IS-1)

Enrollment into the Small General Permit reduces the permitted monthly average flow from 120,000 gpd to 100,000 gpd, decreases the effluent BOD limit 40 mg/L to 30 mg/L monthly average, and adds a total nitrogen removal limit.

The CSA 18 WWTP flow exceeded the draft permit limit for monthly average of 100,000 gpd in January 2023 and was within 10 percent of exceedance in December 2022 and March 2023. The monthly flows increase significantly during wet weather events indicating an inflow and infiltration problem within the collection system.

Figure 1 - Monthly Average Flows 2013-2023



The General Permit requires the following regarding increasing flows:

A Discharger whose wastewater flow rate has been increasing, or is projected to increase, shall estimate when the flow rate will reach hydraulic and treatment capacities of its treatment, collection, and disposal facilities. The projections shall be made in January, based on the last 3 years average dry weather flow rates, peak wet weather flow rates, and total annual flow rates, as appropriate. When any projection shows that capacity of any part of the facilities may be exceeded in 4 years, the Discharger shall notify the Regional Water Board's Executive Officer by March 1st. Providing the notification in an annual report is Acceptable.

Monthly average flows under wet weather conditions are near and above the new permitted limit. The Regional Water Board could require the County to enroll the into the Large General Permit if treatment and capacity limits are frequently exceeded. The Large General Permit discharge limits are similar, however the effluent Total Nitrogen limit changes from 50 percent-reduction to 10 mg/L.

Lab results from Summer 2022 show that the average effluent total nitrogen was 38 mg/L. Denitrification is required to reduce effluent limits to below 10 mg/L. Denitrification is the process by which nitrates are reduced to gaseous nitrogen by facultative anaerobes. During the denitrification process, heterotrophic bacteria utilize nitrate as the electron acceptor to metabolize readily biodegradable substrates. However, if oxygen is available, these bacteria would use it for metabolism.

Conditions within the existing WWTP are not supportive of denitrification and changes to the treatment processes would be required to meet the Large General Permit total nitrogen limit.

Inflow and Infiltration

Inflow and infiltration (I&I) is groundwater and stormwater that enters a sewer system due to damaged pipes or illegal connections to the collection system. Sources of inflow include illegal storm water connections to the sewer system including rain gutter downspouts, foundation drains, faulty manhole cover or frames, etc. Sources of infiltration include broken private sewer laterals, cracked or broken sewer mains, root intrusion, or deteriorated manholes.

Flows to the WWTP increase significantly during wet weather. The storms in December 2022 saturated the ground, amplifying the effects of infiltration from each subsequent rainstorm. The January 2023 storm event produced a significant increase in the influent flow into the WWTP and on January 9th, 2023, 3.93 inches of rain was recorded at the nearby weather station. Rainfall decreased over the next couple of days with 0.91 inches being recorded on January 10th. The flows into the WWTP continued to be high even as rainfall decreased. Flows measured at the WWTP effluent were 207,000, 243,000, and 182,000 gallons for January 9th – 11th.

The County is working to identify main contributors to the I&I. In 2023, the County performed closed-circuit television (CCTV) inspections of the entire CSA 18 gravity sewer collection system. The CCTV inspection reports indicated that the conditions of the sewer mains are generally good and didn't show significant pipe defects. Next steps for locating the source of inflow and infiltration within the collection system include flow monitoring in different tributary areas within the system to identify if there is a specific location that contributes to a higher increase of I&I. This data will inform the County on where to conduct smoke testing to identify areas of I&I. Smoke testing includes putting inert smoke into small segments of the collection system and observing where it comes out, indicating leaks in pipes or illegal

connections. Mitigating the existing I&I problem is a key element in reducing wet weather flow and meeting the future permitted limit of 100,000 gpd monthly average flow.

Conclusion

The wastewater generation rate per capita has reduced over the last decade due to water saving fixtures and water savings practices, resulting in lower dry weather flows. However, because of I&I wet weather flows and peak wet weather flows have increased. To address I&I the County conducted CCTV inspections and planning flow monitoring and smoke testing.

The County is in the process of enrolling into the Small General Permit which establishes a monthly average flow limit of 100,000 gpd. Historical monthly average wet weather flows have exceeded this limit. Frequent violation of the monthly average flow rate of 100,000 gpd could result in the Regional Water Quality Control Board requiring the County to enroll in the Large General Permit. The existing WWTP treatment process is not capable of meeting the discharge limits of the Large General Permit and would require a significant upgrade to include denitrification processes.

Enrollment into the Small General Permit establishes new effluent limits for BOD and Total Nitrogen. Table 4 evaluates the current treatment capacity under three different flow scenarios, including meeting the effluent BOD limit under peak day dry weather flow and peak wet weather flow conditions. Both maximum and recommended dwelling unit equivalents were included (recommended includes a 20 percent factor of safety for BOD). The maximum and recommended number of DUEs were below the future DUE count for the peak day dry weather flow and peak wet weather flows. The calculations conclude that the total number of approved DUEs will exceed the recommended and maximum limits under the analyzed conditions. It is recommended to not approve additional connections within the service boundary until additional treatment capacity is added so that the County does not violate the permitted limits for BOD or monthly average flow.

APN	Category	Existing DUE	Projected DUE
044-082-020	Existing SFR	1.00	
044-082-021	Existing SFR	1.00	
044-082-022	Existing SFR + ADU	1.00	0.75
044-082-023	Existing SFR	1.00	
044-082-024	Existing SFR	1.00	
044-082-025	Existing SFR + ADU	1.75	
044-082-026	Existing SFR	1.00	
044-082-027	Existing SFR	1.00	
044-082-028	Existing SFR	1.00	
044-082-029	Existing SFR	1.00	
044-082-030	Existing SFR	1.00	
044-082-031	Existing SFR	1.00	
044-082-043	Existing SFR	1.00	
044-082-044	Existing SFR	1.00	
044-082-046	Existing SFR	1.00	
044-082-047	Existing SFR	1.00	
044-082-048	Existing SFR	1.00	
044-381-006	Los Ranchos Elementary School	11.00	
044-381-008	Existing SFR	1.00	
044-381-025	Existing SFR	1.00	
044-381-041	Existing SFR	1.00	
044-382-001	Existing SFR	1.00	
044-382-002	Existing SFR + ADU	1.75	
044-382-003	Existing SFR	1.00	
044-382-004	Existing SFR	1.00	
044-382-005	Existing SFR	1.00	
044-382-006	Existing SFR	1.00	
044-382-007	Existing SFR	1.00	
044-382-008	Existing SFR	1.00	
044-382-009	Existing SFR	1.00	
044-421-001	Existing SFR	1.00	
044-421-002	Existing SFR	1.00	
044-421-003	Existing SFR	1.00	
044-421-004	Existing SFR	1.00	
044-421-005	Existing SFR	1.00	
044-421-010	Existing SFR	1.00	
044-421-011	Existing SFR	1.00	
044-422-001	Existing SFR	1.00	
044-422-002	Existing SFR	1.00	
044-422-003	Existing SFR	1.00	
044-422-004	Existing SFR	1.00	
044-422-005	Existing SFR	1.00	
044-422-006	Existing SFR	1.00	

APN	Category	Existing DUE	Projected DUE
044-422-007	Existing SFR	1.00	
044-422-008	Existing SFR	1.00	
044-422-009	Existing SFR	1.00	
044-422-010	Existing SFR	1.00	
044-422-011	Existing SFR	1.00	
044-422-012	Existing SFR	1.00	
044-422-013	Existing SFR	1.00	
044-422-014	Existing SFR	1.00	
044-422-015	Existing SFR	1.00	
044-422-016	Existing SFR	1.00	
044-422-017	Existing SFR	1.00	
044-422-018	Existing SFR	1.00	
044-422-019	Existing SFR	1.00	
044-422-020	Existing SFR	1.00	
044-422-021	Existing SFR	1.00	
044-422-022	Existing SFR + ADU	1.00	0.75
044-422-023	Existing SFR	1.00	
044-422-024	Existing SFR	1.00	
044-422-025	Existing SFR	1.00	
044-422-026	Existing SFR	1.00	
044-422-027	Existing SFR	1.00	
044-422-028	Existing SFR	1.00	
044-422-029	Existing SFR	1.00	
044-422-030	Existing SFR	1.00	
044-422-031	Existing SFR	1.00	
044-422-032	Existing SFR	1.00	
044-422-033	Existing SFR	1.00	
044-422-034	Existing SFR	1.00	
044-422-035	Existing SFR	1.00	
044-422-036	Existing SFR	1.00	
044-422-037	Existing SFR	1.00	
044-422-038	Existing SFR	1.00	
044-422-039	Existing SFR	1.00	
044-422-040	Existing SFR	1.00	
044-422-041	Existing SFR	1.00	
044-422-042	Existing SFR	1.00	
044-422-043	Existing SFR	1.00	
044-422-044	Existing SFR	1.00	
044-422-045	Existing SFR	1.00	
044-422-046	Existing SFR	1.00	
044-422-047	Existing SFR	1.00	
044-422-048	Existing SFR	1.00	
044-422-049	Existing SFR	1.00	

APN	Category	Existing DUE	Projected DUE
044-422-052	Existing SFR	1.00	
044-422-053	Existing SFR	1.00	
044-422-055	Existing SFR	1.00	
044-422-056	Existing SFR	1.00	
044-423-001	Existing SFR	1.00	
044-423-004	Existing SFR	1.00	
044-423-005	Existing SFR	1.00	
044-423-006	Existing SFR	1.00	
044-423-007	Existing SFR	1.00	
044-423-008	Existing SFR	1.00	
044-423-009	Existing SFR	1.00	
044-423-011	Existing SFR	1.00	
044-423-012	Existing SFR	1.00	
044-424-001	Existing SFR	1.00	
044-424-002	Existing SFR	1.00	
044-424-003	Existing SFR	1.00	
044-424-004	Existing SFR	1.00	
044-424-005	Existing SFR	1.00	
044-431-001	Existing SFR	1.00	
044-431-002	Existing SFR	1.00	
044-431-003	Existing SFR	1.00	
044-431-006	Existing SFR	1.00	
044-431-007	Existing SFR	1.00	
044-431-008	Existing SFR	1.00	
044-431-010	Existing SFR	1.00	
044-431-011	Existing SFR	1.00	
044-431-012	Existing SFR	1.00	
044-431-013	Existing SFR	1.00	
044-431-014	Existing SFR	1.00	
044-431-015	Existing SFR	1.00	
044-431-016	Existing SFR	1.00	
044-431-017	Existing SFR	1.00	
044-433-001	Existing SFR	1.00	
044-433-002	Existing SFR	1.00	
044-433-003	Existing SFR	1.00	
044-433-004	Existing SFR	1.00	
044-434-001	Existing SFR	1.00	
044-434-002	Existing SFR	1.00	
044-446-001	Existing SFR	1.00	
044-481-003	Existing SFR	1.00	
044-481-004	Existing SFR	1.00	
044-481-005	Existing SFR	1.00	
044-481-006	Existing SFR	1.00	

APN	Category	Existing DUE	Projected DUE
044-481-008	Existing SFR	1.00	
044-482-001	Existing SFR	1.00	
044-482-002	Existing SFR	1.00	
044-482-003	Existing SFR	1.00	
044-482-004	Existing SFR	1.00	
044-482-005	Existing SFR	1.00	
044-482-006	Existing SFR	1.00	
044-482-007	Existing SFR	1.00	
044-482-008	Existing SFR	1.00	
044-482-011	Existing SFR	1.00	
044-483-004	Existing SFR	1.00	
044-483-005	Existing SFR	1.00	
044-483-006	Existing SFR	1.00	
044-483-007	Existing SFR	1.00	
044-483-008	Existing SFR	1.00	
044-483-009	Existing SFR	1.00	
044-483-010	Existing SFR	1.00	
044-483-011	Existing SFR	1.00	
044-483-012	Existing SFR	1.00	
044-483-013	Existing SFR	1.00	
044-483-014	Existing SFR	1.00	
044-483-015	Existing SFR	1.00	
044-483-016	Existing SFR	1.00	
044-483-017	Existing SFR	1.00	
044-483-018	Existing SFR	1.00	
044-483-019	Existing SFR	1.00	
044-483-020	Existing SFR	1.00	
044-483-021	Existing SFR	1.00	
044-483-022	Existing SFR	1.00	
044-483-023	Existing SFR	1.00	
044-483-024	Existing SFR	1.00	
044-483-025	Existing SFR	1.00	
044-484-001	Existing SFR	1.00	
044-484-002	Existing SFR	1.00	
044-484-003	Existing SFR	1.00	
044-491-044	Existing SFR	1.00	
044-491-051	Existing SFR + ADU	1.75	
044-493-002	Existing SFR	1.00	
044-493-003	Existing SFR	1.00	
044-493-004	Existing SFR	1.00	
044-493-005	Existing SFR	1.00	
044-493-006	Existing SFR	1.00	
044-493-007	Existing SFR	1.00	

APN	Category	Existing DUE	Projected DUE
044-493-008	Existing SFR	1.00	
044-493-009	Existing SFR	1.00	
044-493-010	Existing SFR	1.00	
044-493-011	Existing SFR	1.00	
044-493-014	Existing SFR	1.00	
044-493-015	Existing SFR	1.00	
044-493-019	Existing SFR	1.00	
044-493-020	Existing SFR	1.00	
044-493-021	Existing SFR	1.00	
044-493-022	Existing SFR	1.00	
044-493-023	Existing SFR	1.00	
044-493-025	Existing SFR	1.00	
044-493-026	Existing SFR	1.00	
044-493-027	Existing SFR	1.00	
044-493-028	Existing SFR	1.00	
044-571-026	San Luis Obispo Golf and Country Club Clubhouse	21.50	
044-572-001	Existing SFR	1.00	
044-572-002	Existing SFR	1.00	
044-572-003	Existing SFR	1.00	
044-572-004	Existing SFR	1.00	
044-572-005	Existing SFR	1.00	
044-572-006	Existing SFR	1.00	
044-572-007	Existing SFR	1.00	
044-572-008	Existing SFR	1.00	
044-572-009	Existing SFR	1.00	
044-572-010	Existing SFR	1.00	
044-572-011	Existing SFR	1.00	
044-572-012	Existing SFR	1.00	
044-572-013	Existing SFR	1.00	
044-572-014	Existing SFR	1.00	
044-572-015	Existing SFR	1.00	
044-572-016	Existing SFR	1.00	
044-572-017	Existing SFR	1.00	
044-572-018	Existing SFR	1.00	
044-572-019	Existing SFR	1.00	
044-572-020	Existing SFR	1.00	
044-572-021	Existing SFR	1.00	
044-572-022	Existing SFR	1.00	
044-572-023	Existing SFR	1.00	
044-573-001	Existing SFR	1.00	
044-573-002	Existing SFR	1.00	
044-573-003	Existing SFR	1.00	

APN	Category	Existing DUE	Projected DUE
044-573-004	Existing SFR	1.00	
044-573-005	Existing SFR	1.00	
044-573-006	Existing SFR	1.00	
044-573-007	Existing SFR	1.00	
044-573-008	Existing SFR	1.00	
044-573-009	Existing SFR	1.00	
044-573-010	Existing SFR	1.00	
044-573-011	Existing SFR	1.00	
044-573-012	Existing SFR	1.00	
044-573-013	Existing SFR	1.00	
044-573-014	Existing SFR	1.00	
044-573-015	Existing SFR	1.00	
044-573-016	Existing SFR	1.00	
044-573-017	Existing SFR	1.00	
044-573-018	Existing SFR	1.00	
044-573-019	Existing SFR	1.00	
044-573-020	Existing SFR	1.00	
044-574-001	Existing SFR	1.00	
044-574-002	Existing SFR	1.00	
044-574-003	Existing SFR	1.00	
044-574-004	Existing SFR	1.00	
044-574-005	Existing SFR	1.00	
044-574-006	Existing SFR	1.00	
044-574-007	Existing SFR	1.00	
044-575-001	Existing SFR	1.00	
044-575-002	Existing SFR	1.00	
044-575-003	Existing SFR	1.00	
044-575-004	Existing SFR	1.00	
044-575-005	Existing SFR	1.00	
044-575-006	Existing SFR	1.00	
044-575-007	Existing SFR	1.00	
044-575-008	Existing SFR	1.00	
044-575-009	Existing SFR	1.00	
044-575-010	Existing SFR	1.00	
044-575-011	Existing SFR	1.00	
044-575-012	Existing SFR	1.00	
044-575-013	Existing SFR	1.00	
044-575-014	Existing SFR	1.00	
044-575-015	Existing SFR	1.00	
044-575-016	Existing SFR	1.00	
044-575-017	Existing SFR	1.00	
044-575-018	Existing SFR	1.00	
044-575-019	Existing SFR	1.00	

APN	Category	Existing DUE	Projected DUE
044-575-020	Existing SFR	1.00	
044-576-001	Existing SFR	1.00	
044-576-002	Existing SFR	1.00	
044-576-003	Existing SFR	1.00	
044-576-004	Existing SFR	1.00	
044-576-005	Existing SFR	1.00	
044-576-006	Existing SFR	1.00	
044-576-007	Existing SFR	1.00	
044-576-008	Existing SFR	1.00	
044-576-009	Existing SFR	1.00	
044-576-010	Existing SFR	1.00	
044-576-011	Existing SFR	1.00	
044-576-012	Existing SFR	1.00	
044-576-013	Existing SFR	1.00	
044-576-014	Existing SFR	1.00	
044-576-015	Existing SFR	1.00	
044-576-016	Existing SFR	1.00	
044-576-017	Existing SFR	1.00	
044-576-018	Existing SFR	1.00	
044-576-019	Existing SFR	1.00	
044-576-020	Existing SFR	1.00	
044-576-021	Existing SFR	1.00	
044-576-022	Existing SFR	1.00	
044-576-023	Existing SFR	1.00	
044-576-024	Existing SFR	1.00	
044-576-025	Existing SFR	1.00	
044-576-026	Existing SFR	1.00	
044-576-027	Existing SFR	1.00	
044-576-028	Existing SFR	1.00	
044-576-029	Existing SFR	1.00	
044-576-030	Existing SFR	1.00	
044-581-001	Existing SFR	1.00	
044-581-002	Existing SFR	1.00	
044-581-003	Existing SFR	1.00	
044-581-004	Existing SFR	1.00	
044-581-005	Existing SFR	1.00	
044-581-006	Existing SFR	1.00	
044-581-007	Existing SFR	1.00	
044-581-008	Existing SFR	1.00	
044-581-009	Existing SFR	1.00	
044-581-010	Existing SFR	1.00	
044-581-011	Existing SFR	1.00	
044-581-012	Existing SFR	1.00	

APN	Category	Existing DUE	Projected DUE
044-581-013	Existing SFR	1.00	
044-582-001	Existing SFR	1.00	
044-582-002	Existing SFR	1.00	
044-582-003	Existing SFR	1.00	
044-582-004	Existing SFR	1.00	
044-582-005	Existing SFR	1.00	
044-582-006	Existing SFR	1.00	
044-583-001	Existing SFR	1.00	
044-583-002	Existing SFR	1.00	
044-583-003	Existing SFR	1.00	
044-583-004	Existing SFR	1.00	
044-583-005	Existing SFR	1.00	
044-583-006	Existing SFR	1.00	
044-583-007	Existing SFR	1.00	
044-583-008	Existing SFR	1.00	
044-583-009	Existing SFR	1.00	
044-583-010	Existing SFR	1.00	
044-583-011	Existing SFR	1.00	
044-583-012	Existing SFR	1.00	
044-583-013	Existing SFR	1.00	
044-583-014	Existing SFR	1.00	
044-583-015	Existing SFR	1.00	
044-583-016	Existing SFR	1.00	
044-583-017	Existing SFR	1.00	
044-583-018	Existing SFR + ADU	1.00	0.75
044-583-019	Existing SFR	1.00	
044-583-020	Existing SFR	1.00	
044-583-021	Existing SFR	1.00	
044-583-022	Existing SFR	1.00	
044-583-023	Existing SFR	1.00	
044-583-024	Existing SFR	1.00	
044-583-025	Existing SFR	1.00	
044-583-026	Existing SFR	1.00	
044-584-001	Existing SFR	1.00	
044-584-002	Existing SFR	1.00	
044-584-003	Existing SFR	1.00	
044-584-004	Existing SFR	1.00	
044-584-005	Existing SFR	1.00	
044-584-006	Existing SFR	1.00	
044-584-007	Existing SFR	1.00	
044-584-008	Existing SFR	1.00	
044-584-009	Existing SFR	1.00	
044-584-010	Existing SFR	1.00	

APN	Category	Existing DUE	Projected DUE
044-584-011	Existing SFR	1.00	
044-584-012	Existing SFR	1.00	
044-584-013	Existing SFR	1.00	
044-584-014	Existing SFR	1.00	
044-584-015	Existing SFR	1.00	
044-584-016	Existing SFR + ADU	1.00	0.75
044-584-017	Existing SFR	1.00	
044-584-018	Existing SFR	1.00	
044-584-019	Existing SFR	1.00	
044-584-020	Existing SFR	1.00	
044-584-021	Existing SFR	1.00	
044-584-022	Existing SFR	1.00	
044-584-023	Existing SFR	1.00	
044-584-024	Existing SFR	1.00	
044-584-025	Existing SFR	1.00	
044-584-026	Existing SFR	1.00	
044-584-027	Existing SFR	1.00	
044-584-028	Existing SFR	1.00	
044-584-029	Existing SFR	1.00	
044-584-030	Existing SFR	1.00	
044-584-031	Existing SFR	1.00	
044-584-032	Existing SFR	1.00	
044-584-033	Existing SFR	1.00	
044-584-034	Existing SFR	1.00	
044-584-035	Existing SFR	1.00	
044-584-036	Existing SFR	1.00	
044-584-037	Existing SFR	1.00	
044-584-038	Existing SFR	1.00	
044-584-039	Existing SFR	1.00	
044-584-040	Existing SFR	1.00	
044-585-002	Existing SFR	1.00	
044-585-003	Existing SFR	1.00	
044-585-004	Existing SFR	1.00	
044-585-005	Existing SFR	1.00	
044-585-006	Existing SFR	1.00	
044-585-007	Existing SFR	1.00	
044-585-008	Existing SFR	1.00	
044-585-009	Existing SFR	1.00	
044-585-012	Existing SFR	1.00	
044-585-013	Existing SFR	1.00	
044-585-014	Existing SFR	1.00	
044-585-015	Existing SFR	1.00	
044-585-016	Existing SFR	1.00	

APN	Category	Existing DUE	Projected DUE
044-585-017	Existing SFR	1.00	
044-585-018	Existing SFR	1.00	
044-585-019	Existing SFR	1.00	
044-585-020	Existing SFR	1.00	
044-585-021	Existing SFR	1.00	
044-586-001	Existing SFR	1.00	
044-586-002	Existing SFR	1.00	
044-586-003	Existing SFR	1.00	
044-586-004	Existing SFR	1.00	
044-586-005	Existing SFR	1.00	
044-586-006	Existing SFR	1.00	
044-586-007	Existing SFR	1.00	
044-586-008	Existing SFR	1.00	
044-586-010	Existing SFR	1.00	
044-586-011	Existing SFR	1.00	
044-586-013	Existing SFR	1.00	
044-586-014	Existing SFR	1.00	
044-586-015	Existing SFR	1.00	
044-586-016	Existing SFR	1.00	
044-586-017	Existing SFR	1.00	
044-586-018	Existing SFR	1.00	
044-586-019	Existing SFR	1.00	
044-586-020	Existing SFR	1.00	
044-586-021	Existing SFR	1.00	
044-586-022	Existing SFR	1.00	
044-586-025	Existing SFR	1.00	
044-587-001	Existing SFR	1.00	
044-587-002	Existing SFR	1.00	
044-587-003	Existing SFR	1.00	
044-587-004	Existing SFR	1.00	
044-587-005	Existing SFR	1.00	
044-587-006	Existing SFR	1.00	
044-587-007	Existing SFR	1.00	
044-587-008	Existing SFR	1.00	
044-587-009	Existing SFR	1.00	
044-587-010	Existing SFR	1.00	
044-587-011	Existing SFR	1.00	
044-587-012	Existing SFR	1.00	
044-587-013	Existing SFR	1.00	
044-587-014	Existing SFR	1.00	
044-587-015	Existing SFR	1.00	
044-587-016	Existing SFR	1.00	
044-587-017	Existing SFR	1.00	

APN	Category	Existing DUE	Projected DUE
044-587-018	Existing SFR	1.00	
044-587-019	Existing SFR	1.00	
044-587-020	Existing SFR	1.00	
044-587-021	Existing SFR	1.00	
044-587-022	Existing SFR	1.00	
044-587-023	Existing SFR	1.00	
044-587-024	Existing SFR	1.00	
044-587-025	Existing SFR	1.00	
044-587-026	Existing SFR	1.00	
044-587-027	Existing SFR	1.00	
044-587-028	Existing SFR	1.00	
044-587-029	Existing SFR	1.00	
044-587-030	Existing SFR	1.00	
044-587-031	Existing SFR	1.00	
044-446-004	Jack Ranch SFR	1.00	
044-446-006	Jack Ranch SFR	1.00	
044-446-009	Jack Ranch SFR	1.00	
044-446-011	Jack Ranch SFR	1.00	
044-082-042	Permitted SFR		1.00
044-491-050	Permitted SFR		1.00
044-586-012	Permitted SFR		1.00
044-082-056	Windmill Way SFR		2.00
044-082-057	Windmill Way SFR		1.00
044-082-058	Windmill Way SFR		1.00
044-082-059	Windmill Way SFR		1.00
044-446-001	Jack Ranch SFR		1.00
044-446-002	Jack Ranch SFR		1.75
044-446-003	Jack Ranch SFR		1.00
044-446-005	Jack Ranch SFR		1.00
044-446-007	Jack Ranch SFR		1.00
044-446-008	Jack Ranch SFR		1.00
044-446-010	Jack Ranch SFR		1.00
044-446-012	Jack Ranch SFR		1.00
044-446-013	Jack Ranch SFR		1.00
Total		479.75	20.75

Condition #1

Existing Max Average Monthly Flow	111,439
Existing DUEs	480

Flow Per DUE	232
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Small General Permit Max Average Monthly Flow	100,000
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$$\text{Max No. DUE} = 100,000 / \text{Flow Per DUE}$$

Max No. DUE 431

Condition #2

existing/historical PDDWF	126000
Highest Annual Average Influent BOD	346

$$C_n = C_o / [1 + (kt/n)]^n$$

C_n = Effluent BOD	30	24
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C_o = Influent BOD ₃₄	6
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k = reaction rate	0.5
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t = detention time

n = number of ponds in series	2
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V = total pond volume	1200000
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solve for t

t =	9.6 days
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$$t = V/Q$$

Solve for Q

Q =	125,205	30 mg/L BOD
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Q =	107,261	24 mg/L BOD
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Condition #3 - Peak Wet Weather Flow

Diluted loading during storm

PDDWF*Highest annual average BOD mg/L * 8.34

363 lbs/day BOD

C_s

206.7 mg/L BOD_{in}

fluent concentration during storm

$$C_n = C_o / [1 + (kt/n)]^n$$

Peak Wet Weather Flow

210,667 gpd

$t =$ 6.5 days

$t = V/Q$

Solve for Q

$Q =$ 184,636 30 mg/L BOD

$Q =$ 155,068 24 mg/L BOD