

Appendix H

Water and Sewer Capacity Study

MEMORANDUM



Date: February 4, 2026

To: Jimmy Summer
Covelop, Inc.

From: Greg Hulburd, P.E.; Olivia Williams, E.I.T.
Wallace Group

Subject: 365 Prado Water and Sewer Capacity Study for Proposed Rezoning

Wallace Group has been retained to estimate the water demand and wastewater generation for this 19.3-acre property in San Luis Obispo, CA (APN 053-441-006) under the existing zoning as well as the proposed re-zoning. The property is currently zoned as business park (BP) under the Margarita Specific Plan and is proposed to be rezoned and developed as commercial-service (C-S), including areas with and without residential uses. The estimated demands/flows will be used to assess capacity of existing City infrastructure that will provide service to the site.

- CIVIL AND TRANSPORTATION ENGINEERING
- CONSTRUCTION MANAGEMENT
- LANDSCAPE ARCHITECTURE
- MECHANICAL ENGINEERING
- PLANNING
- PUBLIC WORKS ADMINISTRATION
- SURVEYING / GIS SOLUTIONS
- WATER RESOURCES

Water demands and wastewater flows under current and proposed zoning are summarized in Table 1 below. Explanations and breakdowns of the calculations are included in the sections that follow.

Table 1. Comparison Summary of Estimated Water and Wastewater Flows

USE TYPE	Water	GPD	GPM	Wastewater	GPD	GPM
Business Park (BP)	ADD	35,439	24.6	ADWF	19,137	13.3
	MDD	53,159	36.9	PDWF	36,360	25.3
	PHD		98.4	PHWWF		54.5
	FF		2,500			
	MDD+FF		2,537			
Comm. Serv. (C-S)	ADD	29,403	20.4	ADWF	21,508	14.9
	MDD	44,105	30.6	PDWF	40,865	28.4
	PHD		82	PHWWF		61.2
	FF		2,500			
	MDD+FF		2,531			

ADD = average day demand
 FF = fire flow
 MDD = maximum day demand
 PHD = peak hour demand

ADWF = average dry weather flow
 PDWF = peak dry weather flow
 PHWWF = peak hour wet weather flow

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Since there is a commercial fire flow demand of 2,500 gallons per minute (GPM), sustained for two hours, in both the existing and proposed zoning cases, the fire flow plus maximum day demand (MDD) decreases slightly, from 2,537 GPM under current zoning to 2,531 GPM under proposed zoning. This fire flow requirement was used to verify nearby water service capacity. The modeled available fire flow rate and residual pressure are greater than the minimum required for both zoning scenarios.

Existing Zoning

The property was zoned for BP under the Margarita Area Specific Plan in 2004. The established floor to area ratio from the Specific Plan for business park areas is 0.44¹. This ratio and the net 18.49-acre site area was used to calculate the maximum possible business park square footage, 354,386 SF, to estimate water and sewer demands.

Water Demand

The commercial demand factor of 0.10 gallons per day (GPD) per square foot (SF) from the City of San Luis Obispo Water Master Plan (SLOWMP) was used to estimate water demands from the business park. The recommended peaking factor of 4.0 from the SLOWMP was used to calculate peak hourly demand. Total daily demand and peak hourly demands are shown in Table 2 and Table 3.

Table 2. Estimated Water Demand for Existing Zoning

USE TYPE	NET SITE AREA (AC)	FLOOR TO AREA RATIO FOR BP ¹	BP COMMERCIAL BUILDING AREA (SF)	COMMERCIAL WATER DEMAND FACTOR (GPD/SF) ²	TOTAL DEMAND (GPD)
Commercial					
Business Park (BP)	18.49	0.44	354,386	0.10	35,439

Table 3. Estimated Flow Rates for Existing Zoning

USE TYPE	UNITS	AVERAGE DAY DEMAND	MAXIMUM DAY DEMAND	PEAK HOURLY DEMAND	FIRE FLOW RATE	ANNUAL DEMAND
Commercial						
Business Park (BP)	GPD	35,439	53,159			
	GPM	24.6	36.9	98.4	2,500	
	AFY					39.7

¹ Business park floor area ratio from City of SLO Margarita Area Specific Plan- Section 2.6.5 A.

² Commercial Demand Factor from City of SLO Water Master Plan (Page 4-5). Includes commercial, light industrial, hospitals, restaurants, and landscape.



In addition to the water demand from the existing zoning land uses, the water distribution system is required to supply sufficient flow rate and pressure for fire flow at the property. According to the SLOWMP, the fire flow requirements for commercial sites is 2,500 GPM for two hours. Therefore, the total flow rate that the distribution system is required to provide is the fire flow plus maximum day demand,³ for a total of 2,537 GPM.

Wastewater Generation

Wastewater generation factors based on land use categories are available from the City of San Luis Obispo Wastewater Strategy (SLOWWS). The designated business park (BP) wastewater generation rate is 54 GPD/ thousand square feet (kSF) of gross floor area.⁴ Estimated commercial building square footage and estimated wastewater generation rates are shown in Table 4; the estimated wastewater flow rate is assumed equivalent to average dry weather flow (ADWF).

Table 4. Estimated Wastewater Generation for Existing Zoning

USE TYPE	NET SITE AREA (AC)	FLOOR TO AREA RATIO FOR BP ¹	BP COMMERCIAL BUILDING AREA (SF)	WASTEWATER GENERATION FACTOR (GPD/kSF) ⁴	TOTAL WASTEWATER GENERATION (GPD)
Commercial					
Business Park (BP)	18.49	0.44	354,386	54	19,137

The peak hourly wet weather flow (PHWWF) peaking factor was estimated as 4.1, equivalent to the average PHWWF peaking factors for nearby flow monitoring catchments (N.1 and O.1); these flow monitoring catchments were assumed to have more recently installed sewer lines reflective of new sewer infrastructure.⁵ The peak dry weather flow peaking factor (PDWF) was 1.9. Estimated wastewater generation and peak hourly flows are shown in Table 5.

Table 5. Estimated Wastewater Flow Rates for Existing Zoning

USE TYPE	UNITS	AVERAGE DRY WEATHER FLOW	PEAK DRY WEATHER FLOW	PEAK HOURLY WET WEATHER FLOW
Commercial				
Business Park (BP)	GPD	19,137	36,360	
	GPM	13.3	25.3	54.5

³ MDD is calculated as the ADD multiplied by a peaking factor of 1.5 in per the City of SLOWMP.

⁴ Land use flow category wastewater generation factors from City of SLO Wastewater Collection System Infrastructure Renewal Strategy, Dec. 2015 (Table 4-1, page 26).

⁵ Peak Dry and Wet Weather Flow Peaking Factors from City of SLO Wastewater Collection System Infrastructure Renewal Strategy, Dec. 2015 (Section 4.2.5.2, pages 31-32).



Proposed Zoning

The proposed rezoning of the property is approximately 60% commercial service (C-S) with residential use, and the remainder of the property is C-S without residential use. There are 86 proposed residential buildings, and two (2) proposed commercial buildings (light industrial use). There is one proposed park area, as well as ornamental landscaping that would contribute to the overall water demand for the property.

Water Demand

Per capita water demand was estimated as 42 gallons per capita per day (GPCD) based on the indoor water demand factor for 2030 from the CA Water Code § 10608.20.⁶ Landscaping demands for the area immediately adjacent to the residence are included in the landscaping water demand calculations, in addition to the other landscaped areas in the development. The City of San Luis Obispo Capital Facilities Development Impact Fee Nexus Study provides an estimated population density for multi-family housing of 1.81 persons/unit⁷ which was assigned to two-bedroom dwelling units in this analysis. One- and three-bedroom units were assigned occupancy rates of 1.75 and 2.0, respectively. The four-bedroom unit is comprised of a three-bedroom townhouse and accompanying studio ADU, so the occupancy was estimated at 3.0 (2.0 for the three-bedroom plus 1.0 for the studio). The overall occupancy rate for the proposed development was estimated to be 1.98 persons per household. Assumed occupancy rates are summarized in Table 6.

Table 6. Estimated Residential Water Demand for Proposed Zoning

USE TYPE	QTY	UNITS	ESTIMATED OCCUPANCY (PERSONS PER UNIT) ⁷	AVERAGE PER CAPITA WATER DEMAND FACTOR (GPCD) ⁶	WATER DEMAND PER UNIT (GPD)	TOTAL WATER DEMAND (GPD)
Commercial Service- w/ Residential Area						
1 Bed	39	DU	1.75	42.0	73.5	3,161
2 Bed	61	DU	1.81	42.0	76.0	6,082
3 Bed	104	DU	2.00	42.0	84	8,316
4 Bed	18		3.00	42.0	126	2,268
<i>Sub-Total Residential</i>	<i>222</i>					<i>18,508</i>

The majority of the commercial area will be used for proposed mini-storage, with an estimated water demand factor of 10 gpd/kSF⁸. The commercial areas considered in the proposed zoning water demand include two (2) light industrial buildings, which are made up of 90,000 SF of proposed mini-storage and 10,000 SF of “flex space.” The water demand factor for the

⁶ CA Water Code § 10608.20 Indoor Water Use Factor, 2030 projection per CA DWR <https://water.ca.gov/News/News-Releases/2021/Nov-21/State-Agencies-Recommend-Indoor-Residential-Water-Use-Standard>.

⁷ Multi-Family Population Density from Table 3, City of SLO Capital Facilities Development Impact Fee Nexus Study, 2018.

⁸ Self-Storage Demand Factor, Ventura Water Demand Factor Study, 2020.



flex space is estimated at 348 gpd/kSF, per the Updated Water Demand Factors for Water Vision Santa Barbara⁹. Total commercial demands are shown in Table 7.

Table 7. Estimated Commercial Water Demand for Proposed Zoning

USE TYPE	DESCRIPTION	QTY	UNITS	WATER DEMAND FACTOR (gpd/kSF) ^{2,8,9}	TOTAL DEMAND (GPD)
Commercial Service- w/o Residential Area					
Commercial Service- Light Industrial (Mini-Storage)	Bldg SF	90,000	SF	10	900
Flex Space: Food/Beverage/Office Space	Bldg SF	10,000	SF	348	3,480
<i>Sub-Total Commercial</i>		<i>100,000</i>	SF		<i>4,380</i>

As part of the proposed rezoning and the development of the site as a partially residential area, there is a proposed open space park area, as well as ornamental landscaping throughout the property. Estimated total water use (ETWU) and maximum allowable water allowance (MAWA) values were calculated using the County of San Luis Obispo Compliance Procedure for the Model Water Efficient Landscape Ordinance (MWELo). The ETo value for the City of SLO, 43.8 inches per year, was also sourced from the SLO County MWELo Guidance. The ETWU was used to estimate irrigation demand of parks and the common area ornamental landscaping and streetscaping. Drought-tolerant plant varieties and drip irrigation were assumed for the ornamental landscaping calculations. Irrigation water demands are shown in Table 8.

Table 8. Estimated Landscaping Water Demand Estimate for Proposed Zoning

USE TYPE	PLANT FACTOR ¹⁰ (PF)	LANDSCAPED AREA (SF)	IRRIGATION METHOD	IRRIGATION EFFICIENCY (IE) ¹¹	ETAF (PF/IE)	ETAF X AREA	ETWU (GPD) ¹²
Open Space (Park - Turf)	0.7	15,400	Spray	0.75	0.93	14,373	1,069
Ornamental Landscaping	0.3	195,200	Drip	0.80	0.38	73,200	5,446
<i>Subtotal</i>		<i>210,600</i>					<i>6,515</i>

⁹ Service Commercial Land Use Water Demand Factor, Updated Demand Factors Tech. Memo, Water Vision Santa Barbara, 2021.

¹⁰ For turf, average plant factor for warm (0.6) and cool (0.8) seasons for turf grasses (Plant Factors for Turfgrasses- UC Davis Center for Urban Horticulture). Plant factor of 0.3 used for landscaping, assuming drought-tolerant landscaping and "low" water use (MWELo Guidebook).

¹¹ From SLO County MWELo Performance Based Compliance Package: Irrigation Efficiency- 0.75 for Spray Head, 0.8 for Drip.

¹² From SLO County MWELo Performance Based Compliance Package: ETWU = ETo x 0.62 x ETAF x Area and MAWA = (ETo)(0.62)(ETAF x LA), where ETAF = 0.45 for non-residential areas (different from ETAF using ETWU).



The total water demand from residential, commercial, and irrigation demands is presented in Table 9. A peaking factor of 4.0 from the SLOWMP was applied to the average demand to calculate peak hourly demand.

Table 9. Total Estimated Water Demands for Proposed Zoning

USE TYPE	TOTAL WATER DEMAND (GPD)
SUBTOTAL RESIDENTIAL DEMAND	18,508
SUBTOTAL COMMERCIAL DEMAND	4,530
SUBTOTAL LANDSCAPE DEMAND	6,515
TOTAL AVERAGE DEMAND (GPD)	29,403

The SLOWMP fire flow requirements are 2,000 GPM for two hours for high-density residential zoned areas and 2,500 GPM for two hours for commercial zoned areas. The larger of the two fire flows will be used for this analysis. Therefore, the project site is required to be able to supply a minimum of 2,531 GPM (i.e., MDD + commercial fire flow) for two hours. A summary of estimated flow rates under the proposed zoning is provided in Table 10.

Table 10. Estimated Flow Rates for Proposed Zoning

USE TYPE	UNITS	AVERAGE DAY DEMAND	MAXIMUM DAY DEMAND	PEAK HOURLY DEMAND	FIRE FLOW RATE (MAX)	ANNUAL DEMAND
Mixed Use						
Commercial Service (C-S)	GPD	29,403	44,105			
	GPM	20.4	30.6	81.7	2,500	
	AFY					32.9

Wastewater Generation

The wastewater generation factor for multi-family residential is based on the 42 GPCD water demand factor and estimated population density per unit used in Table 6 above, assuming 100% of water demand is converted to wastewater. Residential wastewater flow estimates are shown in Table 11. Water demand from the mini-storage is also assumed to be 100% converted to wastewater flow. 60% of water demand from the 10,000 SF of “flex space” is expected to return as wastewater. Commercial wastewater flow estimates are shared in Table 12.



Table 11. Estimated Residential Wastewater Generation for Proposed Zoning

USE TYPE	QTY	UNITS	WASTEWATER GENERATION FACTOR (GPD/DU) ⁶	TOTAL WASTEWATER GENERATION (GPD)
Commercial Service- w/ Residential Area				
1 Bed	39	DU	73.5	2,867
2 Bed	61	DU	76.0	4,637
3 Bed	104	DU	84.0	8,736
4 Bed	18	DU	126	2,268
<i>Sub-Total Residential</i>	<i>222</i>			<i>18,508</i>

Table 12. Estimated Commercial Wastewater Generation for Proposed Zoning

USE TYPE	COMMERCIAL BUILDING AREA (SF)	WASTEWATER GENERATION FACTOR (GPD/kSF) ^{4,8,9}	TOTAL WASTEWATER GENERATION (GPD)
Commercial Service- w/o Residential Area			
Light Industrial (Mini-Storage)	90,000	10	900
Flex Space: Food/Beverage/Office Space	10,000	210	2,100
<i>Sub-Total Commercial</i>	<i>100,000</i>		<i>3,000</i>

Total wastewater flows from residential and commercial sources are shown in Table 13. The PHWWF peaking factor used for all flows was 4.1 and the PDWF peaking factor was 1.9, the same used under the existing and proposed zoning.

Table 13. Estimated Total Wastewater Generation for Proposed Zoning

USE TYPE	TOTAL WASTEWATER GENERATION (GPD)
Sub-total Residential	18,508
Sub-total Commercial	3,000
Grand Total	21,508



Table 14. Estimated Wastewater Flow Rates for Proposed Zoning

USE TYPE	UNITS	AVERAGE DRY WEATHER FLOW	PEAK DRY WEATHER FLOW	PEAK HOURLY WET WEATHER FLOW
<u>Commercial-Service</u>				
	GPD	21,508	40,865	
	GPM	14.9	28.4	61.2

Available Water Service

Existing Distribution System

Water service to the site will be provided by the City of San Luis Obispo’s existing water distribution infrastructure. The project site is located in the Edna Saddle zone and will be served by the Edna Saddle tank. Water service to the project site will be connected to an existing 20” water main in Prado Road. Nearby water distribution facilities include an 8” main in Serra Meadows Drive, an 8” main in Empresa Drive, and a 12” main in South Higuera Street. No upgrades to the City’s water distribution system would be required to meet water demand and fire flow requirements for this project.

Distribution System Capacity

To determine if the available water service is sufficient to meet project requirements, a fire flow scenario was run in the City of SLO water distribution model to check flow rates, static pressure, and residual pressure, as shown in Figure 1. Static pressure at the project site was checked under an Average Day Demand (ADD) flow scenario, and fire flow/residual pressure were checked under a Maximum Day Demand (MDD) scenario. Per the City of SLOWMP, the MDD peaking factor is 1.5. For the fire flow test, the total flow at the node was equal to MDD + fire flow demand, a total of 2,531 gpm. Water system information for this area is shown in Table 15.



Figure 1. City of SLO Water Model at the Project Site

Table 15. Water System Information for Water Services to the Project Site

Pressure Zone	Edna Saddle
Water Supply	Edna Saddle Tank Madonna/Higuera PRV
Tank Elevation during Average Day Demand (ADD)	345 ft
Tank Elevation during Maximum Day Demand (MDD)	339 ft
Madonna/Higuera PRV HGL	340 ft
Development Elevation	128 ft
Water Main Diameter	20-inch
Water Main Material	DI
Required Fire Flow (FF) for Commercial per the WMP	2,500 gpm

Results from the water model fire flow scenario are shown in Table 16. The available fire flow is greater than the required fire flow of 2,500 GPM, per the SLOWMP, plus the maximum day demand of 31 GPM (i.e., 2,531 GPM), and the residual pressure at this flow rate is greater than the required minimum of 20 psi.

Table 16. Water Model Results

PARAMETER	RESULT
Static Pressure under ADD	93 psi
Available Fire Flow during MDD	6,000 gpm
Residual Pressure at Fire Flow	90 psi at 2,531 gpm

Proposed Onsite Improvements

Water service will be provided to the site through a proposed water main that runs throughout the project site and will be tied into the 20" DI water main in Prado Rd. This proposed main will provide the required flow to meet requirements for average day demand (20.4 gpm), up to the full fire flow demand of 2,531 gpm.

Available Sewer Capacity

Existing Collection System

The project site will be served by the City of SLO's existing gravity sewer collection system. The existing city facilities adjacent to the project site include a 12" HDPE gravity line to the southwest of the project site, which runs in an existing 25' sewer easement east of Sueldo Road, between APN 076-38-001 and Tract 3009. The gravity lines flow south to the Tank Farm lift station, southeast of the City of SLO wastewater treatment facility (WWTF). The force main from the Tank Farm lift station pumps the wastewater north to Prado Road and then west to the WWTF.

Collection System Capacity

The City of San Luis Obispo Uniform Design Criteria provides that sewer main size must be determined by designing for the pipe to flow half-full, considering the development, any upstream development, and existing infiltration under PHWWF conditions. Verification of existing system sewer capacity to manage the project's projected wastewater flows is pending City review.

Proposed Onsite Improvements

The proposed onsite sewer collection system shall be composed of 6" or 8" HDPE sewer mains, per the City's Design Criteria. Other design criteria, per the SLOWWS, include a maximum depth/diameter (d/D) of 0.5 for pipes 8" in diameter or smaller, as well as a minimum velocity of 3 feet per second (ft/s).

Conclusion

Water demand and wastewater generation was assessed for the project site under existing (BP) and proposed zoning (C-S). A summary of estimated flow rates under both zoning scenarios is provided in Table 1.

Available system capacity for the proposed zoning change was evaluated and confirmed for the updated water demand through review of the City's water system hydraulic model. Confirmation of suitable sewer capacity must be verified through the City and its third-party consultant which manages the wastewater collection system hydraulic model.