



Existing Condition or in the Future Cumulative Condition. The proposed Project increases the total base sewer generation for the site by 19,599 gpd under existing modeled conditions and by 14,967 gpd under future cumulative modeled conditions. There are no CIPs in the 2022 SMP that outline upsizing pipes along the pipes in the flow path. The increased Project sewer flows do not significantly impact the sewer system.

**Introduction**

The proposed Project proposes to construct a mixed-use residential building development with 299 multi-family residential units and 23,000 square feet of commercial development. This study estimates the incremental difference in water demand and sewer flow resulting from Project development and evaluates impacts compared to previous study findings. The incremental difference is added to the City’s existing models for Existing and Future Cumulative Conditions. The Existing and Future Cumulative Conditions use the City’s models developed as part of the 2022 WMP and SMP. Projected increase in demands across the City in the Future Cumulative Condition model are consistent with growth projections from the 2020 Urban Water Management Plan (UWMP).

**Water System Impact**

**Incremental Project Contribution**

The incremental difference in Average Daily Demand (ADD) with the 749 W El Camino Real Project is 25,413 gpd greater than the Existing demand and 17,623 gpd greater than the Future Cumulative demand allocated in the models. The ADD is an estimated daily average demand based on totalized annual water use.

Project water demand is estimated from the number of residential units and the square footage of retail and restaurant provided in the plans dated October, 2022. Table 1 shows the Project demand estimation using water unit duty factor from Table 2-2 in the NBPPPII UIS. Table 2 presents the water demand in the City’s hydraulic models for the Existing Condition, and Table 3 shows the water demand for the Future Cumulative Condition. The Project site is serviced by one 12-inch water main along El Camino Real and one 6-inch water main along Castro Street. The 6-inch water main transitions to an 8-inch at the intersection with El Camino Real. The Project Plans show connection to an existing 18-inch in Castro Street; however, the existing fire hydrants and parcel services are all connected to the 6-inch pipe in Castro Street and the model reflects a new Project service connecting to the 6-inch main in Castro Street.

**Table 1: Project Estimated Water Demand**

Address	Individual Use	Units/Square Feet	Generation Factor (gpd/unit or gpd/1000 sq ft)	Water Demand (gpd)
749 W El Camino Real	Retail	20,500	130	2,665
	Restaurant	2,500	1,200	3,000
	Multi-Family Residential	299	100	29,900
<b>Total</b>				<b>35,565</b>

**Table 2: Existing Model Water Demand**

Address	Land Use	Modeled Water Demand (gpd)
193-02-049	Commercial	3,859
193-02-050	Restaurant	6,293
<b>Total</b>		<b>10,152</b>

**Table 3: Future Cumulative Model Water Demand**

Address	Land Use	Modeled Water Demand (gpd)
193-02-049	Commercial	11,189
193-02-050	Restaurant	6,754
<b>Total</b>		<b>17,942</b>

**Fire Flow Requirement**

The required planning-level fire flow at the Project site in the 2022 WMP is 3,500 and 2,500 gpm for existing and future conditions, respectively. The Project required fire flow is 2,941 gpm based on building size and construction type as defined in the California Building Code. The Project fire flow assumes a reduction of 50% of the fire flow requirement when the building is equipped with an approved automatic sprinkler system. The actual fire flow requirement may change as the planning process continues and project-specific requirements are determined by the City Fire Marshal.

Adjacent parcels to the Project have a planning-level required fire flow of 3,500 gpm at the same model node. The modeled fire flow was therefore not modified from 3,500 gpm at that junction to ensure adjacent parcels requirements were met for planning purposes. The modeled fire flow at the junctions with a fire flow 2,500 gpm was updated to the Project required fire flow of 2,941 gpm.

**Model Results**

The water system is evaluated under Peak Hour Demand (PHD) to ensure a minimum pressure of 40 psi can be maintained per the City's design performance criteria. A peaking factor of 1.73, taken from the 2022 WMP, is applied to the average daily water demand. There are no existing hydraulic deficiencies per the minimum pressure requirements near the Project site in either the Existing or Future Cumulative condition. The system has capacity for the increased Project demand while meeting PHD performance criteria and does not affect previous study findings.

The water system is also evaluated to ensure adequate capacity is available to convey fire flows under Maximum-Day Demand (MDD) conditions while maintaining a minimum pressure of 20 psi in the system. A peaking factor of 1.25, taken from the 2022 WMP, is applied to the ADD to represent MDD conditions for which the fire flow analysis is conducted. From the previous studies, the planning-level fire flow requirement is met along W El Camino Real and along Castro Street in the Existing Conditions as shown in Figure 2. In the current configuration, the Project connects to a 6-inch diameter water main in Castro and the future condition is modeled similarly. In the Existing Conditions, pre- and post-project available fire flow along the 6-inch water main in Castro Street is 5,893 gpm and along the 12-inch water main in W El Camino Real is 13,725 gpm. City annual replacement project CIP AR 1-5 is proposed to replace the 6-inch along Castro Street with a new 8-inch main.

The Future Cumulative Conditions planning-level and Project-specific fire flow requirements are met at the Project site assuming all CIPs outlined in the 2022 WMP, are constructed. There are no deficiencies in the area pre- or post-Project. There are two CIPs adjacent to the Project, one CIP proposed is a portion of the City’s annual replacement projects, AR 1-5, and the other is CIP 16, both from the 2022 WMP.

**Project Contribution to Existing Deficiencies**

There are no deficiencies at the Project site in the Existing Condition. In the Future Cumulative Condition, assuming all the CIPs outlined in the 2022 WMP have been constructed, the system has sufficient capacity to serve the Project. As a note, CIP AR 1-5, a portion of the City’s annual replacement projects, is adjacent to the Project site and will improve service along Castro Street.

**Sewer System Impact**

**Incremental Project Contribution**

The incremental difference in Base Wastewater Flow (BWF) with the Project is 19,599 gpd greater than the Existing flow and 14,967 gpd greater than the Future Cumulative flow estimate in the computer models. Base wastewater flow (BWF) is from residential, commercial, institutional, office and industrial sources and represents a daily average for wastewater flows and is used to model City-wide demands.

Project generated sewer flow is estimated from the number of residential units and the square footage of retail and restaurant provided in the plans dated October 26, 2022. The use-type sewer duty factors are used from Table 4-2 in the NBPPPII Utility Impact Study to estimate sewer flow. Table 4 provides the estimated Project sewer flow. Table 5 presents the sewer generation in the City’s hydraulic models for the Existing Condition, and Table 6 shows the sewer generation for the Future Cumulative Condition. The sewer flow from the Project is assumed to discharge to sewer mains on two streets based on the preliminary utility plan from October, 2022. The proposed sewer system connections are assumed to be to the existing 8-inch SS line within El Camino Real, and to the 10-inch SS line on Castro Street.

**Table 4: Project Estimated Sewer Flow**

Address	Individual Use	Units/Square Feet	Generation Factor (gpd/unit or gpd/1000 sq ft)	Sewer Generation (gpd)
749 W El Camino Real	Retail	20,500	100	2,050
	Restaurant	2,500	900	2,250
	Multi-Family Residential	299	75	22,425
<b>Total</b>				<b>26,725</b>

**Table 5: Existing Model Sewer Flow**

Address	Land Use	Modeled Sewer Generation (gpd)
193-02-049	Commercial	2,702
193-02-050	Restaurant	4,424
<b>Total</b>		<b>7,126</b>

**Table 6: Future Cumulative Model Sewer Flow**

Address	Land Use	Modeled Sewer Generation (gpd)
193-02-049	Commercial	7,334
193-02-050	Restaurant	4,424
<b>Total</b>		<b>11,758</b>

**Model Results**

The affected area of the gravity system evaluated for the Project impact begins at the intersection of Castro Street and El Camino Real. The sewer system then flows west along Church Street and Latham Street, north along Escuela Avenue, across Central Expressway, north along Sierra Vista Avenue, west on Plymouth Street, north on N Rengstorff Avenue, west on Leghorn, and north on Independence to the Shoreline Sewage Pump Station. The Project sewer conveyance pathway is highlighted in Figure 3. Sewer capacity is analyzed under Peak Wet Weather Flow (PWWF) and Average Dry Weather Flow (ADWF). PWWF is used to determine hydraulic deficiencies according to the performance criteria in Table 7, and ADWF is used to determine Project flow contribution when determining fair-share for improvements. Once pipes are considered deficient, the design criteria outlined in Table 8 shall be used to size the CIP to correct the deficiency. ADWF is used to determine adequacy of wastewater treatment capacity.

**Table 7: Sewer System Performance Criteria**

Criteria	Entire System
Minimum Freeboard in Each Manhole (ft)	5.0

**Table 8: CIP Design Criteria**

Criteria	Pipe Diameter	Pipe Diameter
	≤ 12 inch	> 12 inch
Maximum Flow Depth/Pipe Diameter (d/D)	0.50	0.75

The PWWF scenario applies diurnal peaking curves for residential and non-residential flows and simulates system response as rainfall enters the system. The diurnal peaking curves are adopted from the City’s 2022 SMP. Groundwater Infiltration (GWI) and rainfall-dependent infiltration (RDI/I) are included but are not peaked. The ADWF scenario is developed in the model by adding BWF and groundwater GWI. GWI is modeled as a constant inflow and includes base infiltration (BI) and pumped groundwater discharged to the sewer system. Since the ADWF scenario models average daily flows, BWF and GWI are not peaked.

There are no deficiencies along the Project conveyance pathway in the Existing Condition or the Future Cumulative Condition. The increased Project flow does not generate new deficiencies and the CIPs outlined in the 2022 SMP are adequately sized to convey anticipated flows in the future.

**Project Contribution to Deficiencies**

There are no deficiencies along the Project conveyance pathway in the Existing Condition or in the Future Cumulative Condition.

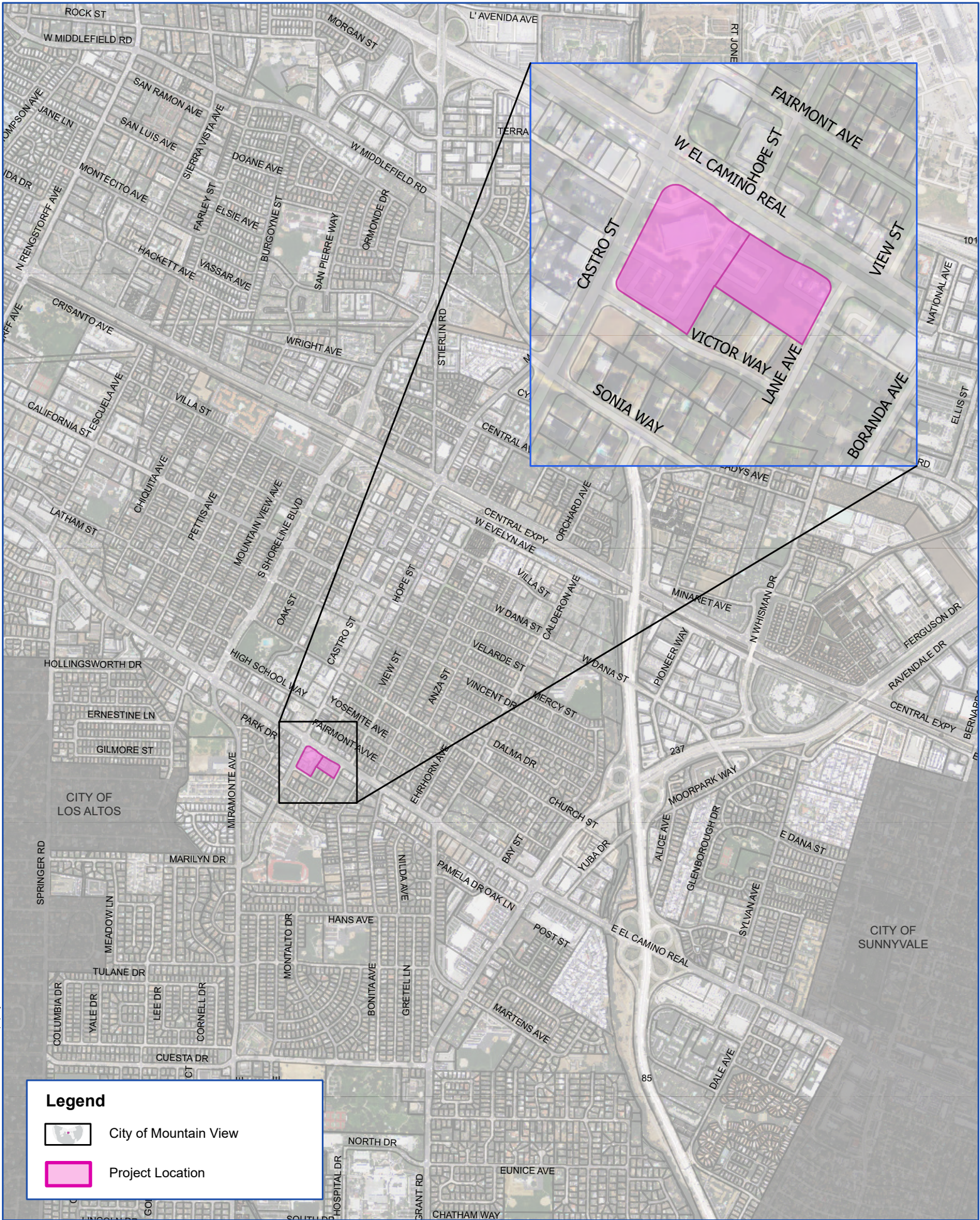
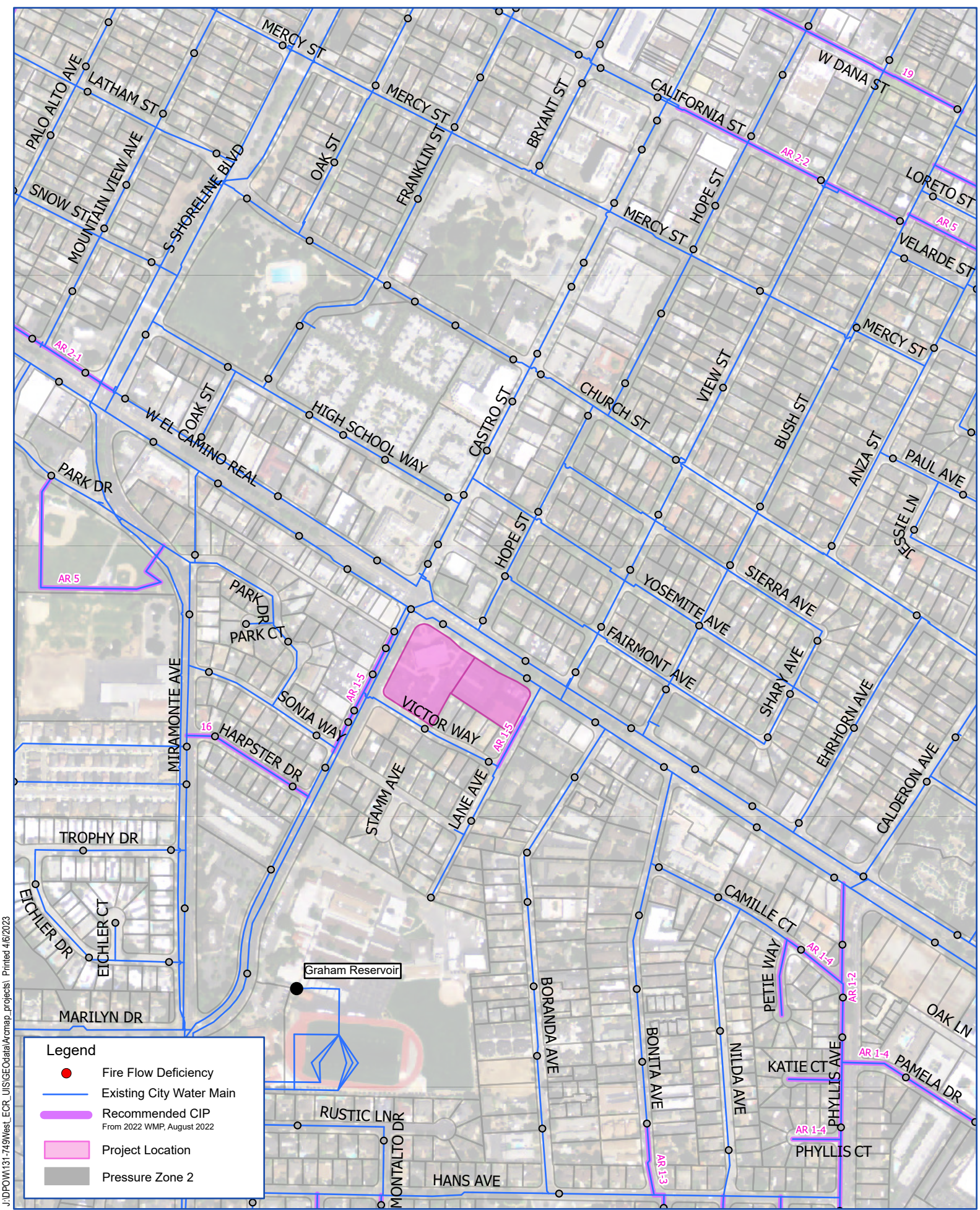
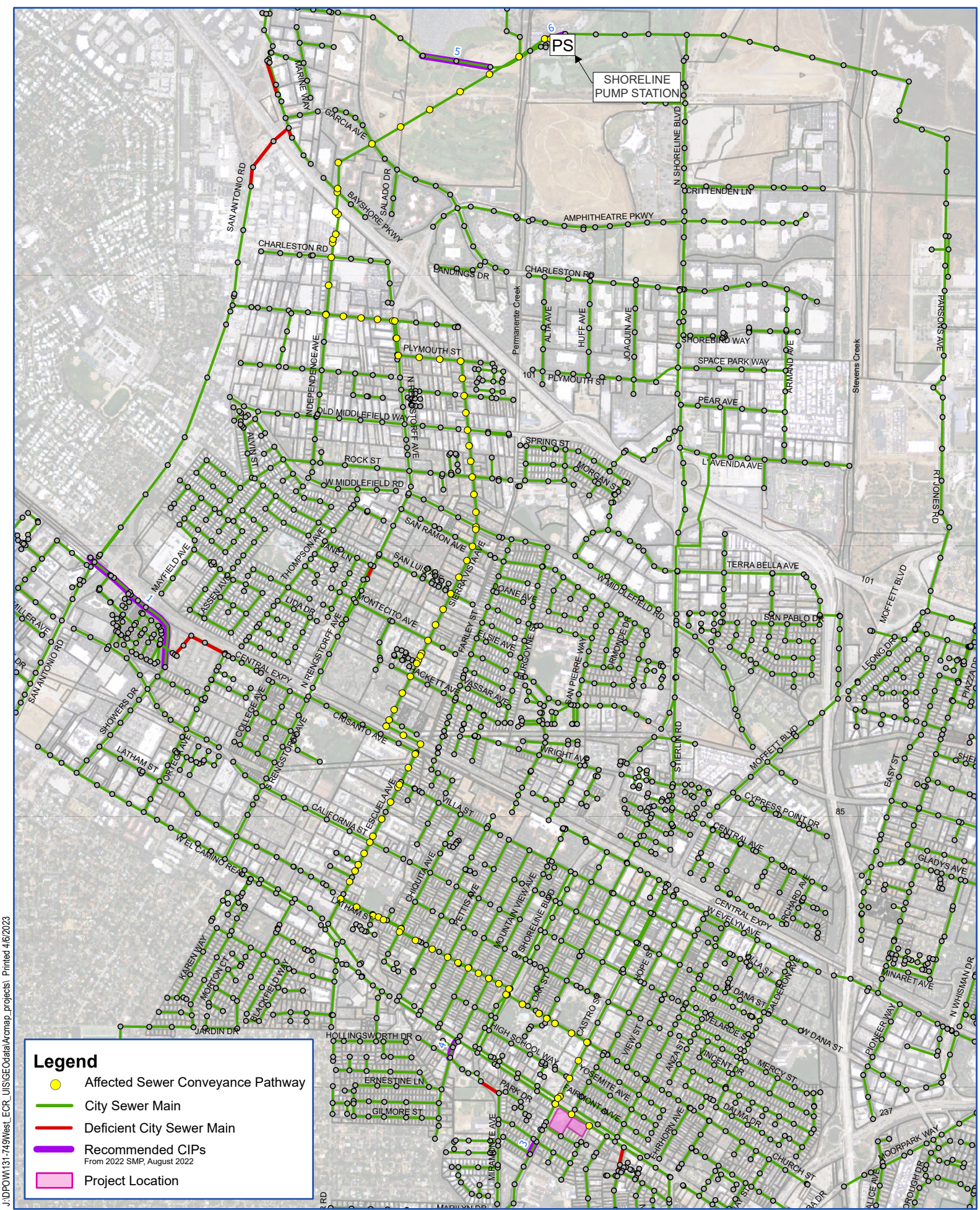


FIGURE 1: Project Location

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**Legend**

- Affected Sewer Conveyance Pathway
- City Sewer Main
- Deficient City Sewer Main
- Recommended CIPs  
From 2022 SMP, August 2022
- Project Location

**FIGURE 3: Peak Wet Weather Flow Sewer System Model**

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