East Whisman Precise Plan
Utility Impact Study

Prepared for
David J. Powers & Associates

and

City of Mountain View
500 Castro Street
Mountain View, CA 94041

CITY OF MOUNTAIN VIEW

REGISTERED PROFESSIONAL ENGINEER
LEIF M. COPONEN
C70139
CIVIL
STATE OF CALIFORNIA

LEIF M. COPONEN, California RCE No. 70139

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Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS

1171 Homestead Road, Suite 255
Santa Clara, CA 95050
(408) 246-4848
FAX (408) 246-5624
lcoponen@swsv.com

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Executive Summary

Schaaf & Wheeler has been retained by David J. Powers & Associates to determine impacts from the East Whisman Precise Plan Project (Project) on the City of Mountain View's (City) water and sanitary sewer systems. The Project encompasses 368 acres bounded by North Whisman Road, U.S. Highway 101, the border with the City of Sunnyvale, Central Expressway, and State Highway 237 (Figure B-1). The Project proposes the development and preparation of a Precise Plan for the area in keeping with the 2030 General Plan adopted in 2012. The General Plan described a vision for a transit-oriented center, an improved multimodal transportation network, and a greater diversity of land uses.

Project impacts to the water system are analyzed for both Existing (2010) and Future Cumulative (2030) Condition. Hydraulic models simulating pre- and post-Project development scenarios are performed to examine hydraulic deficiencies. The Existing Condition is based on the *2010 Water Master Plan* (WMP) and the Future Cumulative Condition model is created from the *2030 General Plan – Updated Water System Modeling Alternative 1* (GP-UWSM Alt 1; Schaaf & Wheeler, November 2014) model. Within the North Bayshore Precise Plan boundary, the model is further updated based on the *North Bayshore Precise Plan Phase II Utility Impact Study* (NBPPII UIS; Schaaf & Wheeler, October 2016) model. The Future Cumulative Condition model includes CIPs from the NBPPII UIS and recent City approved projects not accounted for or in exceedance of the 2030 GPUUIS projections.

Project impacts to the sewer system are analyzed for Existing (2010) and Future Cumulative (2030) Conditions. Hydraulic models simulating pre- and post-Project development scenarios are performed to examine hydraulic deficiencies. The Existing Condition is based on the *2010 Sewer Master Plan* (SMP). The Future Cumulative Condition sewer model is created from the *General Plan Update Utility Impact Study* (GPUUIS; IEC, October 2013) model and includes all sewer system CIPs recommended in the GPUUIS. The Future Cumulative Condition includes recent City approved projects not accounted for or in exceedance of the 2030 GPUUIS projections.

Water System Project Impacts

The Project development does not significantly impact the water system under peak hour demand (PHD) at Existing Condition. Under the Future Cumulative Condition assuming all of the recommended CIPs in the NBPPII UIS have been constructed, the system also meets performance criteria under PHD pre- and post-Project.

The anticipated fire flow requirements are met during Existing Condition and Future Cumulative Condition within the Project area. The Project fire flow requirement used in this analysis is based on fire flow requirements developed as part of the NBPPII UIS. The actual fire flow requirements may change as the planning process continues and Project specific requirements are determined by the City Fire Marshal. If Project conditions require higher fire flow than what is analyzed, revised modeling should be conducted.

Sewer System Project Impacts

The sewer system does not have sufficient capacity in the Existing Condition with or without the estimated increase in incremental Project flow. In the Pre-Project condition, model results indicate that three pipes along North Whisman Road within the Project boundary are at risk of surcharging. With Project development, those same three pipes and one additional pipe along North Whisman Road are at risk of surcharging. CIPs #72, 75, 77, and 83 recommended in the GPUUIS address these deficiencies.

In the Future Cumulative Condition assuming all of the CIPs recommended in the GPUUIS are constructed, four additional pipes do not meet the d/D performance criteria post-Project and require additional CIPs. Model results show that none of the four pipes are at risk for surcharging. To meet d/D performance criteria for these pipes, it is recommended that a total of six pipes are upsized; one pipe is recommended to be upsized from 10-inch to 15-inch diameter pipe and five pipes are recommended to be upsized from 18-inch to 21-inch pipe, respectively. Other than the four additional deficient pipes and corresponding additional CIPs, CIPs recommended in the GPUUIS are sufficient for the incremental increase in flow due to Project development.

Chapter 1. Introduction

1.1. Project Description

The East Whisman Precise Plan Project (Project) encompasses 368 acres, covering approximately 120 parcels bounded by North Whisman Road, U.S. Highway 101, the border with the City of Sunnyvale, Central Expressway, and State Highway 237 (Figure B-1). Currently, the area is distinguished by high-technology campuses and large-format commercial office buildings situated on large blocks.

The General Plan, however, describes a vision for a transit-oriented center, an improved multi-modal transportation network, and a greater diversity of land uses. The Project area is split into six "complete neighborhoods" that define the desired character and amount of land uses within the different parts of the Project area. The proposed land use for the Project will result in a net increase of approximately 2.3 million square feet of office, 40,000 square feet of retail, 60,000 square feet of restaurants, 5,000 multi-family residential units, and 200 hotel rooms.

1.2. Water System Analysis Approach

Project impacts are analyzed using the City's water models for two conditions: Existing (2010) and Future Cumulative (2030). As a baseline for system performance, each condition is evaluated pre-Project for existing hydraulic deficiencies. The estimated incremental water demand resulting from Project development is added to the model and post-Project deficiencies are examined. In total, four model simulations of the water system are performed, as shown in Figure 1.

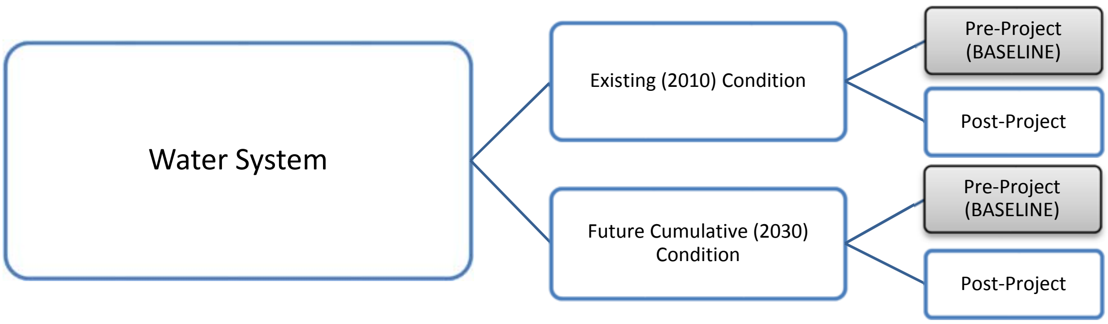

Figure 1. Water System Model Simulations

The Existing Condition model consists of the existing distribution system and operating parameters along with water demands based on existing land use from the *2010 Water Master Plan* (WMP). Within the East Whisman Precise Plan boundary, water demands are updated to be consistent with current land use based on information provided by the City. Fire flow requirements are revised based on the fire flow rates in Table 2-4 of the *North Bayshore Precise Plan Phase II Utility Impact Study* (NBPPII UIS; Schaaf & Wheeler, 2016).

The Future Cumulative Condition water demand is based on the 2030 General Plan Update (GPU) land use and has since been revised to include recent City approved projects not accounted for or in exceedance of the 2030 GPU projections. Table A-1 in Appendix A provides a list of the considered development projects for the Future Cumulative Condition. The Future Cumulative Condition model is based on the *2030 General Plan – Updated Water System Modeling Alternative 1* (GP-UWSM Alt 1) model and assumes all of the recommended CIPs in the NBPPII UIS have been constructed. The GP-UWSM Alt 1 updates the *General Plan Update Utility Impact Study* (GPUUIS; IEC, October 2011) with revisions to demands, network components, boundary conditions, fire flow requirements, and recommended CIPs. The NBPPII UIS updates some CIPs recommended in the GP-UWSM Alt 1 based on revised demand and fire flow requirements within the North Bayshore Precise Plan boundary. Within the East Whisman Precise Plan area, fire flow requirements are revised based on the fire flow requirements in Table 2-4 of the NBPPII UIS.

1.3. Sewer System Analysis Approach

Project impacts to the sewer system are analyzed using the City's sewer models for two conditions: Existing (2010) and Future Cumulative (2030). As a baseline for system performance, each condition is evaluated pre-Project for existing hydraulic deficiencies. The estimated sewer flow resulting from Project development is added to the model and post-Project deficiencies are examined. In total, four model simulations of the sewer system are performed, as shown in Figure 2.

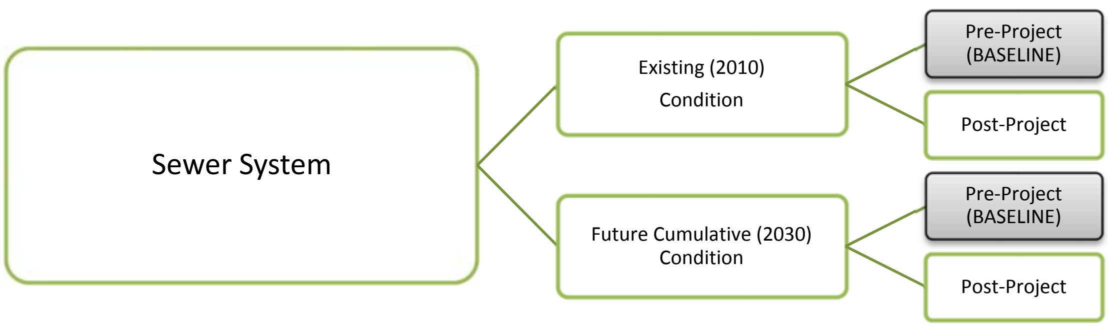

Figure 2. Sewer System Model Simulations

The Existing Condition model consists of the existing collection system and operating parameters along with from the *2010 Sewer Master Plan* (SMP). Within the East Whisman Precise Plan boundary, sewer flows are updated to be consistent with current land use based on information provided by the City. The Future Cumulative Condition sewer flows are based on the 2030 GPU land use and have since been revised to include recent City approved projects not accounted for or in exceedance of the 2030 GPU projections. Table A-1 in Appendix A provides a list of the considered development projects for the Future Cumulative Condition. The Future Cumulative Condition includes the operating parameters in the 2030 GPUUIS model and assumes that all sewer system CIPs in the 2030 GPUUIS have been constructed.

1.4. Report Organization

This report is organized into five chapters. Chapter 2 discusses the water demand estimates for the Project. Chapter 3 covers the impacts and capital improvement recommendations for the water system. Chapter 4 discusses the sewer flow estimates and Chapter 5 covers the capital improvements recommendations for the sewer system.

Chapter 2. Water Demand Projections

This chapter discusses the estimated water demand and required fire flow for the Project development. The proposed Project demand is added to the Existing and Future Cumulative Condition models as an incremental difference from the baseline water demand modeled at the Project site. The pre-Project baseline demand in the Existing and Future Cumulative Condition follows the methodology described in the 2010 WMP and 2030 GPUUIS. Within the Project area, pre-Project baseline demand in the Existing Condition is set to match land use types and densities provided by the City. The water unit duty factor for estimating Project demand is taken from previous technical studies to remain consistent with the City-wide demand projections used in the hydraulic models.

Water demand in this section represents Average Daily Demand (ADD). The ADD is an estimated daily average of water use patterns that varies by season and customer type.

2.1. Project Water Demand

Project water demand is estimated using proposed land use types and densities as provided by the City and water unit duty factors developed for the City as part of the North Bayshore Precise Plan Phase II Utility Impact Study (NBPPII UIS). These unit duty factors are based on water meter records of recent developments throughout the City. Table 2-1 provides the demand estimation for the Project area with proposed development types and densities.

Table 2-1: Project Estimated Water Demand

Condition	Water Demand (gpd)
Project	1,727,509

2.1.1. Project Required Fire Flow

Anticipated fire flow requirements within the Project area are based on fire flow requirements developed as part of the NBPPII UIS, shown in Table 2-2. Fire flow requirements are assigned based on land use types developed as part of the East Whisman Precise Plan.

Table 2-2: Anticipated Project Fire Flow Requirements

Land Use	Required Fire Flow Rate (gpm)
Low and Medium Density Residential	1,500
Medium to High Density Residential	2,500
Neighborhood Commercial	2,500
General Commercial	3,500
Industrial Commercial	3,500
Office	2,500
High Intensity Office	3,500
General Mixed-Use	3,500
Neighborhood Mixed-Use	2,500
North Bayshore Mixed-Use	3,500
Mixed-Use Center	3,500
Parks	1,500
Institutional	3,500

2.2. Existing Condition (2010)

2.2.1. Pre-Project (Baseline) Demand

The pre-Project (baseline) condition is based on existing land use types and densities provided by the City and water unit duty factors developed for the City as part of the NBPPII UIS. Table 2-3 provides the estimated demand for existing pre-Project conditions.

Table 2-3: Baseline Demand for Existing Condition

Condition	Water Demand (gpd)
Pre-Project	695,051

2.2.2. Post-Project Incremental Demand

For the Project impact analysis in the Existing Condition, Project demand is added to the Existing Condition model as an incremental difference from the pre-Project demand. This overall incremental demand is spread across the Project area given land use types and densities developed as part of the Precise Plan. The incremental Project demand in the Existing Condition is given in Table 2-4.

Table 2-4: Incremental Project Demand for Existing Condition

	Water Demand (gpd)
Pre-Project (Baseline) Demand	695,051
Project Demand	1,727,509
Incremental Project Demand	***+ 1,032,458***

2.3. Future Cumulative Condition (2030)

2.3.1. Pre-Project (Baseline) Land Use and Demand

Future Cumulative (baseline) demand for the Project is adopted from the City's InfoWater model developed as part of the 2030 GPUUIS. In the 2030 GPUUIS model, water demands are based on the 2030 General Plan Update (GPU) land use; these demands have since been updated to include recent City approved projects outlined in Table A-1 in Appendix A, which were not accounted for or were in exceedance of the 2030 GPU projections. Additionally, the five projects under consideration for the transfer of developable rights from the San Antonio Precise Plan area to the East Whisman Precise Plan area are included as pre-project conditions. Table 2-5 presents the pre-project Future Cumulative Condition demand.

Table 2-5 – Baseline Demand for Future Cumulative Condition (Based on Model)

Condition	Water Demand (gpd)
Pre-Project	1,182,816

2.3.2. Post-Project Incremental Demand

Project demand is added to the model as an incremental difference from the pre-Project demand. The incremental Project demand in the Future Cumulative Condition is given in Table 2-6. As with the Existing Condition model, this incremental demand is spread across the Project area following land use types and densities developed as part of the East Whisman Precise Plan.

Table 2-6: Incremental Project Demand for Future Cumulative Condition

	Water Demand (gpd)
Pre-Project (Baseline) Demand	1,182,816
Project Demand	1,727,509
Incremental Project Demand	***+ 544,693***

Chapter 3. Water System Impact

Project impacts to water supply, water storage, hydraulic conveyance, and fire flow requirements are evaluated in this chapter to ensure the Project demand can be adequately met. Hydraulic conveyance and available fire flow are assessed for both Existing (2010) and Future Cumulative (2030) Conditions. Water supply and water storage are evaluated for the Future Cumulative Condition.

3.1. Demand Scenarios and Performance Criteria

Hydraulic deficiencies within the water system are evaluated under two demand scenarios: Peak Hour Demand (PHD) and Maximum Day Demand with Fire Flow (MDD + FF). The MDD and PHD peaking factors from the 2010 Water Mater Plan (WMP) are used for this analysis. As detailed in the 2010 WMP, MDD and PHD peaking factors are developed using SCADA data from peak usage months in 2006 and 2007. The peak hour occurred on the day with the largest daily demand, which was observed to be August 8, 2007. The calculated peaking factors, presented in Table 3-1, are applied to Average Day Demand (ADD).

Table 3-1: Peaking Factors

Category	Peaking Factor
Maximum Day	1.71
Peak Hour	2.79

Established design criteria used to evaluate the Project impact for all scenarios are summarized in Table 3-2.

Table 3-2: Water System Performance Criteria

Criteria	PHD	MDD + FF
Minimum Allowable Pressure (psi)	40	20

3.2. Water Supply Analysis

The increased water demand from Project development in the Future Cumulative Condition is compared with the City's supply turnouts and groundwater well capacities to ensure demand can be met. The Mountain View water system is divided into three pressure zones to maintain reasonable pressures throughout the City's rising topography moving south, further from the Bay. Most of the Project area is located in Pressure Zone 2, which is supplied by two San Francisco Public Utilities (SFPUC) turnouts (Turnout #7 and #14). A small portion of the Project area is located in Pressure Zone 1, which, at this time, is supplied by only one SFPUC turnout (Turnout #5).

Water demand versus supply capacity by Pressure Zone is given in Table 3-3. Demand in Pressure Zone 2 can be sufficiently supplied by SFPUC Turnouts #7 and #14 based on the supply capacity provided in Table 3-8 of the *2030 General Plan Update Utility Impact* Study (IEC, 2011). However, total capacity for Pressure Zone 2 includes peak hour turnout capacity from SFPUC Turnouts #7 and #14 and can be supplemented from Wells #19 and #20, if needed.

Total capacity for Pressure Zone 1 includes peak hour turnout capacity from SFPUC Turnout #5 and additional supply supplemented from Wells #22 and #23. Demand in Pressure Zone 1 cannot be sufficiently supplied by the current supply operation; however, as discussed in the *2030 General Plan Update Utility Impact Study* (IEC, 2011), surplus supply in Pressure Zone 2 could be routed to Pressure Zone 1 to make-up the supply deficiency in the Pressure Zone 1. A pressure reducing valve (PRV) moving water from Pressure Zone 2 to Pressure Zone 1 at North Whisman Road, between Walker Drive and Whisman Court, is included in the *North Bayshore Precise Plan II Utility Impact Study* (NBPPII UIS; Schaaf & Wheeler, October 2016). The ability of the system to meet Project demand and the fire flow requirement at Future Cumulative Condition assumes this CIP has been constructed. The additional Project demand does not impact the City's ability to meet total system demand.

Table 3-3: Future Cumulative Condition Demand versus Supply

Pressure Zone	2030 Future Cumulative Demand			Total Capacity (mgd)*
	Pre-Project		Post-Project	
	ADD (mgd)	PHD (mgd)	PHD (mgd)	
1	7.11	19.84	19.84	16.56
2	8.38	23.38	24.89	30.53
3	1.61	4.49	4.49	5.10
Total	**17.10**	**47.71**	**49.22**	**52.19**

** Total Capacity from Table 3-8 in the General Plan Update Utility Impact Study (IEC, 2011)*

3.3. Water Storage Analysis

Project impact to water storage volume requirements is evaluated according to the State Water Resources Control Board Division of Drinking Water (DDW). DDW requires storage equal to 8 hours of Maximum Day Demand (MDD) plus fire flow storage in each pressure zone. The required storage versus active storage in the City is detailed in Table 3-4 pre- and post-Project. The maximum active storage in the City is 17 MG. However, the City currently operates with only the operational active storage of 14.3 MG.

The fire flow volume in Table 3-4 revises the requirement in the 2010 WMP and is estimated from the largest fire flow requirement in each pressure zone. Based on CFC requirements the fire flow volume is calculated as 5,000 gpm for 4 hours. Pressure Zone 3 has the potential for a reduction in required fire flow volume since the controlling fire flow requirement is the hospital along Grant Road, which has a planning-level fire flow requirement of 3,500 for 4 hours.

Since the City has the storage volume available to meet DDW requirements in the Future Cumulative Condition pre- and post-Project, no additional storage improvements are recommended. In the future, when City demand and storage requirements exceed the current operating storage, the City may need to alter reservoir operation schemes.

Table 3-4: DDW Storage Requirements

Pressure Zone	Maximum Active Storage* (MG)	Operational Active Storage (MG)	Fire Flow (MG)	Future Cumulative Condition Demand					
				Pre-Project			**Post-Project**		
				ADD (mgd)	**8 Hours of MDD (MG)**	**DDW Requirement (MG)**	**ADD (mgd)**	**8 Hours of MDD (MG)**	**DDW Requirement (MG)**
1	6.00	5.1	1.2	7.11	4.05	5.25	7.11	4.05	5.25
2	8.00	6.5	1.2	8.38	4.78	5.98	8.93	5.09	6.29
3	3.00	2.7	1.2	1.61	0.92	2.12	1.61	0.92	2.12
Total	**17.00**	**14.3**	**3.6**	**17.10**	**9.75**	**13.35**	**17.65**	**10.06**	**13.66**

** Maximum Active Storage from Table 4-2 in the General Plan Update Utility Impact Study (IEC, 2011)*

3.4. Existing Condition (2010) Results

3.4.1. Peak Hour Demand (PHD) – Pre and Post Project

System pressures are evaluated under Peak Hour Demand (PHD) pre-Project (Figure B-2) and post-Project (Figure B-3). At Existing Condition, the system meets performance criteria system-wide. Pressures are slightly lower in Pressure Zone 2 with Project development, but the system still meets performance criteria.

3.4.2. Maximum Day Demand with Fire Flow (MDD+FF) – Pre and Post Project

In the Existing Condition, the system is able to meet fire flow requirements within the Project area, as shown on Figure B-4, though there are deficiencies outside of the Project area. With Project development, no additional deficiencies occur within the Project area, but there are additional deficiencies outside the Project boundary in Pressure Zone 2, as shown in Figure B-5.

3.4.3. Deficiencies – Pre and Post Project

With Existing Condition demand, the water system meets system design criteria at PHD and is able to adequately supply the increased Project demand. Fire flow deficiencies exist pre-Project outside of the Project boundary and 38 of those deficiencies show between a 1% and 3% reduction in available fire flow due to Project development. Nine additional fire flow deficiencies occur post-Project, with seven occurring in the area between Easy Street, Central Expressway, North Whisman Road, and Gladys Avenue. The impact from the Project, including both the reduction in available fire flow for existing deficiencies and the additional deficiencies resulting from Project development, can be mediated with CIPs #8, 10, 11, 20, 21, 36, 37, and 95 shown on Figures B-6 through B-11. These CIPs are based on the *2030 General Plan – Updated Water System Modeling Alternative 1* (GP-UWSM Alt 1; Schaaf & Wheeler, November 2014). CIP #95 was previously unidentified in the GP-UWSM Alt 1 but is needed to address a fire flow deficiency in the Existing Condition pre- and post-Project. It recommends upsizing approximately 276 feet of 4-inch diameter pipe along Hedgerow Court to 8-inch diameter pipe.

3.5. Future Cumulative Condition (2030) Results

3.5.1. Peak Hour Demand (PHD) – Pre and Post Project

The system has adequate pressure pre-Project (Figure B-6) and is able to satisfy post-Project demands while meeting the design criteria at PHD (Figure B-7) at Future Cumulative Condition.

3.5.2. Maximum Day Demand with Fire Flow (MDD+FF) – Pre and Post Project

In the Future Cumulative Condition, the system is able to meet the fire flow requirements within the Project boundary pre- and post-Project as shown on Figures B-8 and B-9. Within Pressure Zone 2, there are seven deficient nodes, but they are far from and independent of the Project. These nodes show minimal (<1%) impact due to Project development. No additional deficiencies occur due to Project development.

3.5.3. Deficiencies – Pre and Post Project

With the recommended CIPs from the GP-UWSM Alt 1, including CIP #95, and NBPPII UIS, the City-wide system has adequate pressures pre- and post-Project and is able to meet the fire flow requirements within the Project area. Section 3.6 discusses the CIP needs specific to the East Whisman Precise Plan.

3.6. Recommended CIPs

In order to have sufficient water supply for development within the Project area and alleviate fire flow deficiencies affected by the Project development, seven CIPs from the GP-UWSM Alt 1 are recommended to be completed prior to Project development, as shown in Table 3-5. CIPs #35, 39, 43, and 44 are recommended because they are water lines that directly connect to parcels within the Project area.

However, as part of the East Whisman Precise Plan, new streets are proposed within the Project area and new water mains could be installed along these street alignments to improve connectivity within the Project area. With these new pipes, three of the CIPs (35, 43, and 44) recommended in the GP-UWSM Alt 1 may not be required. With 8-inch diameter main installed along the new streets, the system has adequate pressures under PHD post-Project as shown in Figure B-10. Fire flow requirements are also met within the Project area with new 8-inch diameter mains post-Project (Figure B-11). The same seven fire flow deficiencies outside of the Project boundary are present with the new pipe network.

CIPs #24, 36, and 37 are not directly connected to the parcels within the Project area, but are affected by Project development. CIP #24 is a conveyance CIP that allows for more connectivity across Evelyn Avenue. CIPs #36 and 37 are recommended in the GP-UWSM Alt 1 to address local deficiencies; however, model results show 1-2% reduction in available fire flow in the Existing Condition and less than 1% reduction in fire flow at the local deficient locations in the Future Cumulative Condition with Project development. Because Project development has minor impacts on available fire flow in this area, it is discretionary whether these CIPs need to be constructed prior to Project development.

Table 3-5: Recommended CIPs from GP-UWSM Alt 1

Project Description	2030 GP-UWSM Alt 1 CIP #	Length (ft)	Existing Diameter (in)	CIP Diameter (in)	Recommended 2030 GP-UWSM Alt 1 CIP
E. Evelyn Ave, between Kittyhawk Way and Ferry Morse Way	24	65	-	12	Yes
Central Expy, between Ravendale Dr. and N Bernardo Ave	35	1550	-	12	Yes*
Whisman Station Dr., between Miranet Ave and Beverly St	36	400	-	8	Yes
Easy St, Central Expy, and Ada Ave	37	970	8	12	Yes
Flynn Ave, west of N Whisman Rd	39	370	6	8	Yes
National Ave, west of Ellis St	43	745	8	12	Yes*
Clyde Ct, south of Clyde Ave	44	380	8	12	Yes*

**May not be required if new 8-inch diameter pipes are installed along new street alignments*

Chapter 4. Sewer Flow Projections

This chapter discusses the sewer flow estimate for Project development and provides a comparison to pre-Project baseline condition. The incremental Project flow is determined for the Existing (2010) and Future Cumulative (2030) Condition as discussed in the following sections. The pre-Project baseline sewer flow in the Existing and Future Cumulative Conditions follows the methodology described in the 2010 SMP and 2030 GPUUIS. The sewer generation factor for estimating Project sewer flow is taken from previous technical studies (2010 WMP, 2030 GPUUIS, and NBPPII UIS) to remain consistent with the City-wide flow projections used in the hydraulic models.

Three types of sewer flow loading are used to model the sewer system: base wastewater flow, groundwater infiltration (GWI), and rainfall-dependent infiltration/inflow (RDI/I). GWI includes base infiltration (BI) and pumped groundwater discharged to the sewer system. RDI/I is stormwater that enters the sewer system. GWI and RDI/I values are modeled as constant flows.

Base wastewater flow (BWF) is from residential, commercial, institutional, office, and industrial sources. As described in the 2010 Sewer Master Plan (SMP), BWF is developed on an individual parcel level using the 2005 and 2006 water billing records and applying a return-to-sewer (RTS) ratio calculated for land use type. Change in BWF throughout the day due to daily use patterns is known as diurnal variation and is accounted for by applying residential and non-residential diurnal curves. BWF and diurnal curves used in this analysis are taken from the 2010 SMP to remain consistent with previous City-wide modeling. The sewer flows discussed in this section are the BWF values representing average flows and are not peaked.

4.1. Project Sewer Flow

Project generated sewer flow is estimated using proposed land use types and densities as provided by the City. A return-to-sewer (RTS) ratio is applied to water duty factors from the NBPPII UIS for each of the land use types. The RTS ratios are based on the RTS ratios provided in the 2010 SMP (Table 3-2). Table 4-1 provides the sewer flow estimation for the Project area.

Table 4-1: Project Estimated Sewer Flow

Condition	Sewer Flow (gpd)
Project	1,225,362

4.2. Existing Condition (2010)

4.2.1. Pre-Project (Baseline)

The pre-Project (baseline) condition sewer flow is based on existing land use types and densities provided by the City. Sewer generation factors for each land use type are determined using RTS ratios from Table 3-2 in the 2010 SMP and water unit duty factors developed for the City as part of the NBPPII UIS. Table 2-3 provides the estimated flow for existing pre-Project conditions.

Table 4-2: Baseline Flow for Existing Condition

Condition	Sewer Flow (gpd)
Pre-Project	472,328

4.2.2. Post-Project Incremental Demand

For the Project impact analysis in the Existing Condition, Project sewer flow is added to the Existing Condition model as an incremental difference from pre-Project demand. This overall incremental flow is spread across the Project area given land use types and densities developed as part of the East Whisman Precise Plan. The Project incremental sewer flow for the Existing Condition is given in Table 4-3.

Table 4-3: Incremental Project Flow for Existing Condition

	Sewer Flow (gpd)
Pre-Project (Baseline) Flow	472,328
Project Flow	1,225,362
Incremental Project Flow	***+ 753,034***

4.3. Future Cumulative Condition (2030)

4.3.1. Pre-Project (Baseline)

Future Cumulative (baseline) flow for the Project is adopted from the City's InfoSWMM model developed as part of the 2030 GPUUIS. In the 2030 GPUUIS model, sewer flows are based on the 2030 General Plan Update (GPU) land use; these demands have since been updated to include recent City approved projects outlined in Table A-1 in Appendix A, which were not accounted for or were in exceedance of the 2030 GPU projections. Additionally, the five projects under consideration for the transfer of developable rights from the San Antonio Precise Plan area to the East Whisman Precise Plan area are included as pre-project conditions. Table 4-4 presents the pre-project demand.

Table 4-4: Baseline Flow for Future Cumulative Condition (Based on Model)

Condition	Sewer Flow (gpd)
Pre-Project	1,040,592

4.3.2. Post-Project Incremental Demand

Project flow is added to the Future Cumulative Condition model as an incremental difference from pre-Project flow. The incremental Project flow is given in Table 4-5. As with the Existing Condition model, this incremental flow is spread across the Project area following land use types and densities developed as part of the East Whisman Precise Plan.

Table 4-5: Incremental Project Flow for Future Cumulative Condition

	Sewer Flow (gpd)
Pre-Project (Baseline) Flow	1,040,592
Project Flow	1,225,362
Incremental Project Flow	***+ 184,770***

Chapter 5. Sewer System Impact

The impact of Project development on the sewer system is analyzed under Existing (2010) and Future Cumulative (2030) Conditions. The specific affected area of the gravity system evaluated for Project impact begins at the Project area and flows north to the Shoreline Sewer Pump Station via the East Trunk.

5.1. Scenarios and Performance Criteria

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 5-1. ADWF is used to determine adequacy of treatment capacity.

The ADWF scenario is developed in the model by adding BWF and GWI. Since the ADWF scenario models average daily flows, BWF and GWI are not peaked. The PWWF scenario applies the diurnal peaking curves for residential and non-residential flows and simulates system response to rainfall dependent inflow and infiltration. The diurnal peaking curves are adopted from the City's 2010 SMP. Groundwater Infiltration (GWI) and rainfall-dependent infiltration/inflow (RDI/I) are included, but are not peaked.

Table 5-1: Sewer System Performance Criteria

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

5.2. Sewer Treatment, Joint Interceptor, and San Antonio Interceptor Capacity

Sewage generated within the City is treated at the Regional Water Quality Control Plant (RWQCP) in Palo Alto. The sewer collection system is a gravity system with the majority of flow discharging into three main trunk lines that convey flow from the south to the north and terminate at the SPS located within the City's Shoreline Park. Flow is then pumped to the gravity Joint Interceptor Sewer that conveys flow to the RWQCP. The remaining flow not received at the SPS is discharged to the Los Altos' San Antonio Interceptor that also conveys flow into the Joint Interceptor.

The City entered into a joint agreement, referred to as the Basic Agreement, with the cities of Palo Alto and Los Altos in 1968 for the construction and maintenance of the joint sewer system addressing the need for conveyance, treatment, and disposal of wastewater to meet Regional Board requirements. In accordance with the Basic Agreement, Palo Alto owns the RWQCP and administers the Basic Agreement with the partnering agencies purchasing individual capacity rights in terms of an average annual flow that can be discharged to the RWQCP. Capacity rights of the three cities can be rented or purchased from other neighboring agencies and each partnering agency can sell their capacity to others. Contractual capacity is based upon the 1985 Addendum No. 3 of the 1968 Joint Sewer System agreement that revised capacity rates in relationship to facility expansion and is based upon Average Annual Flow (defined as 1.05 times Average Dry Weather Flow). Separate service agreements with the RWQCP have since reallocated current capacity rights to include six partnering agencies. Table 5-2 presents the current capacity rights for each agency.

Table 5-2: RWQCP Joint Facilities Capacity Rights

Partner Agency	Treatment Capacity	72-inch Joint Interceptor Capacity
	Average Annual Flow (MGD)	**Peak Wet Weather Flow (MGD)**
Palo Alto	15.3	14.59
East Palo Alto Sanitary District	3.06	0
Los Altos Hills	0.63	3.41
Stanford University	2.11	0
Mountain View	15.1	50
Los Altos	3.8	12
Total	***40***	***80***

Source: Long Range Facilities Plan for the Regional Water Quality Control Plant (City of Palo Alto, May 2012)

The City's total capacity rights include flow leaving the City through the SPS and the amount of flow that the City discharges into the Los Altos' San Antonio Interceptor, per the 1970 Los Altos San Antonio Trunk Sewer Capacity Agreement between the two cities. The total system-wide contractual capacity for Mountain View is evaluated in the Existing and Future Cumulative Conditions with increased Project flow. Table 5-3 shows the City's projected flows compared to the RWQCP Joint Facilities capacity rights.

Per the Basic Agreement, the partnering agencies agree to conduct an engineering study when their respective service area reaches 80% of their contractual capacity rights. The Future Cumulative Condition estimates that the projected demand pre-Project and post-Project will exceed the 80% capacity threshold. The required engineering study when the City reaches 80% of their capacity shall redefine the anticipated future needs of the treatment plant.

Table 5-3: Capacity Rights Comparison

RWQCP Joint Facility	Mountain View Contractual Capacity (MGD)	Pre-Project		Post-Project	
		2010 Existing (MGD)	**2030 Future Cumulative (MGD)**	**2010 Existing (MGD)**	**2030 Future Cumulative (MGD)**
Treatment	15.1	10.22	14.36	11.01	14.56
Joint Interceptor	50.0	16.81	21.78	17.77	22.26

* *Treatment = Average Annual Flow (AAF), Joint Interceptor = PWWF*

5.3. Existing Condition (2010) Results

5.3.1. Peak Wet Weather Flow (PWWF) Scenario – Pre and Post Project

The sewer system does not have sufficient capacity downstream of the Project with either the pre-Project and post-Project flows in the Existing Condition as shown in Figures B-12a, B-12b, B-13a, and B-13b.

5.3.2. Deficiencies – Pre and Post Project

In the pre-Project condition, approximately 2,340 feet of pipe does not meet the d/D performance criteria. Most of the pipe segments are not at risk for surcharging; however, model results show three pipe segments (Model ID 1120, 1219, and 1269) are at risk for surcharging.

With the incremental increase in flow due to Project development, an additional 3,650 feet of pipe does not meet the d/D performance criteria with the incremental Project flow. In addition to the three pipe segments that were at risk for surcharging in the pre-Project condition, one pipe segment (Model ID 1309) is at risk for surcharging with the Project development. All deficient pipes are identified in Table 5-4.

5.4. Future Cumulative Condition (2030) Results

5.4.1. Peak Wet Weather Flow (PWWF) Scenario – Pre and Post Project

The system meets d/D performance criteria downstream of the Project in the Future Cumulative Condition pre-Project as shown in Figures B-14a and B-14b. In the post-Project condition, four pipe segments (Model ID 971, 1011, 1033, and 1377) do not meet the performance criteria, as shown in Figure B-15a and B-15b, but model results indicate that they are not at risk for surcharging. To meet d/D performance criteria for all pipes within and downstream of the Project, it is recommended that these four segments and two additional segments (Model ID 954 and 939) be upsized. One pipe (Model ID 1377) is recommended to be upsized from 10-inch to 15-inch diameter pipe and five pipes (Model ID 1033, 1011, 971, 954, and 939) are recommended to be upsized from 18-inch to 21-inch diameter pipe. With these improvements, the system meets d/D performance criteria within and downstream of the Project area in the Future Cumulative Condition post-Project, as shown in Figures B-16a and B-16b.

5.4.2. Deficiencies – Pre and Post Project

The system meets d/D performance criteria in all pipes downstream of the Project in the pre-Project condition. Four pipe segments (Model ID 971, 1011, 1033, and 1377) do not meet the criteria with the incremental increase in demand from the Project development but are not at risk for surcharging. Table 5-4 presents the recommended CIP pipe diameters. The 2030 GPUUIS recommended diameters are shown in bold green font. The Schaaf & Wheeler recommended diameters are shown in bold blue font.

5.5. Recommended Sewer CIPs

Approximately 8,100 feet of sewer mains within the Project boundary were identified as deficient in the 2030 GPUUIS based on d/D performance criteria. To address these deficiencies, nine CIPs were recommended in the GPUUIS; these CIPs recommend upsizing the pipes from their original diameter to 8-, 12-, and 15-inch diameter, as detailed in Table 5-4. With these CIPs, the sewer system meets d/D performance criteria without the Project incremental increase in flow. Hydraulic model results presented here estimate that with the 2030 GPUUIS recommended CIPs, four pipe segments (Model ID 971, 1011, 1033 and 1377) exceed performance criteria during PWWF post-Project. If these pipes and two additional pipes (Model ID 954 and 939) are upsized to 15-inch and 21-inch diameters, all pipes within and downstream of the Project site meet performance criteria both pre- and post-Project in the Future Cumulative Condition.

In order to have sufficient sewer capacity for Project development, seven of the nine CIPs recommended in the 2030 GPUUIS (CIPs #72, 78, 79, 80, 81, 82, and 83) are recommended to be completed prior to the proposed development. CIP #78 includes a recently constructed 10-inch pipe (Model ID 1948) in Ferguson Drive south of East Middlefield Road that is recommended to be upsized to the 12-inch diameter per the GPUUIS to meet d/D performance criteria.

CIPs #75 and 77 are recommended in the GPUUIS due to backwater effects in the model. It is anticipated that CIP #75 is identified as a CIP in the GPUUIS due to the piping configuration in the model. Pipes in the model are matched invert to invert; however, pipes are commonly installed to match crown to crown. Prior to constructing CIP #75, the City should verify invert elevations for the existing 6-inch diameter pipe in Flynn Avenue (Model ID 1465) at the connection with the sewer main in North Whisman Road. If this pipe (Model ID 1465) matches crowns with the 12-inch diameter sewer main in North Whisman Road, then the pipe has sufficient capacity in the Existing and Future Cumulative Condition with Project development and does not need to be upsized from the existing 6-inch diameter pipe.

CIP #77 recommends upsizing a 15-inch pipe (Model ID 1120) to 18-inch diameter pipe. However, model results show that with the construction of CIP #72 along North Whisman Road, this pipe does not need to be upsized and has sufficient capacity in the Future Cumulative Condition with Project development.

Table 5-4: Recommended East Whisman Precise Plan Sewer CIPs

Project Description	2030 GPUUIS CIP #	Model ID	Length (ft)	Existing Diameter (in)	CIP Diameter (in)	Deficiency[1]				Recommended GPUUIS CIP[2]
						2010 Pre-Project	2010 Post-Project	2030 Pre-Project	2030 Post-Project	
N Whisman Rd between Skyview Ct and Evandale Ave	72	1588	421	12	15	No	No	No	No	Yes
		1519	25	12	15	No	No	No	No	Yes
		1514	306	12	15	Yes	Yes	No	No	Yes
		1464	131	12	15	Yes	Yes	No	No	Yes
		1438	434	12	15	No	No	No	No	Yes
		1358	230	12	15	No	No	No	No	Yes
		1319	87	12	15	Yes	Yes	No	No	Yes
		1309	262	12	15	Yes	Yes	No	No	Yes
		1269	293	12	15	Yes	Yes	No	No	Yes
		1219	435	12	15	Yes	Yes	No	No	Yes
		1103	436	12	15	Yes	Yes	No	No	Yes
Flynn Avenue west of N Whisman Rd	75	1465	301	6	8	Yes[3]	Yes[3]	No[3]	No[3]	No[3]
N Whisman Rd and Devonshire Ave	77	1120	65	15	18	Yes[4]	Yes[4]	No[4]	No[4]	No[4]
Ferguson Dr south of E Middlefield Rd	78	1948	535	10	12	No	Yes	No	No	Yes
		1867	388	10	12	No	No	No	No	Yes

Notes:

1. *For 2010 (Pre- and Post-Project), deficiency is based on existing pipe diameter. For 2030 (Pre- and Post-Project), deficiency is based on CIP pipe diameter.*
2. *Recommended GPUUIS CIP column represents the GPUUIS CIP projects that are recommended to be constructed prior to Project development.*
3. *City to verify pipe inverts at intersection of Flynn Avenue and North Whisman Road; if pipes match crowns, Model ID 1465 does not need to be upsized.*
4. *CIP #77 not required if CIP #72 is constructed*

Table 5-4: Recommended East Whisman Precise Plan Sewer CIPs (Continued)

Project Description	2030 GPUUIS CIP #	Model ID	Length (ft)	Existing Diameter (in)	CIP Diameter (in)	Deficiency[1]				Recommended GPUUIS CIP[2]
						2010 Pre-Project	2010 Post-Project	2030 Pre-Project	2030 Post-Project	
E Middlefield Rd from Ferguson Dr through Ellis St	79	1791	258	15	15	No	No	No	No	No[3]
		1746	280	15	15	No	No	No	No	No[3]
		1711	340	10	12	No	Yes	No	No	Yes
		1663	368	12	12	No	No	No	No	No[3]
		1624	388	10	12	No	Yes	No	No	Yes
Ellis St north of E Middlefield Rd	80	1623	308	12	15	No	No	No	No	Yes
		1557	379	12	15	No	No	No	No	Yes
		1498	396	12	15	No	Yes	No	No	Yes
Easement between Ellis St and B St	81	1363	504	10	12	No	Yes	No	No	Yes
Fairchild Dr from Ellis St to B St	82	1105	297	10	12	No	Yes	No	No	Yes
National Ave south of Fairchild Dr	83	1084	319	8	15	Yes	Yes	No	No	Yes
Easement between Ellis St and B St	–	1377	342	10	10/15	No	Yes	No	Yes/No	Yes
Fairchild Dr between Ellis St and N Whisman Rd	–	1033	227	18	18/21	No	Yes	No	Yes/No	Yes
		1011	384	18	18/21	No	Yes	No	Yes/No	Yes
		971	198	18	18/21	No	Yes	No	Yes/No	Yes
		954	123	18	18/21	No	No	No	No/No	Yes
		939	293	18	18/21	No	No	No	No/No	Yes

Notes:

1. *For 2010 (Pre- and Post-Project), deficiency is based on existing pipe diameter. For 2030 (Pre- and Post-Project), deficiency is based on CIP pipe diameter.*
2. *Recommended GPUUIS CIP column represents the GPUUIS CIP projects that are recommended to be constructed prior to Project development.*
3. *Model ID 1791, 1746, and 1663 have already been replaced as part of recent construction and match the proposed diameter in the GPUUIS recommended CIP.*

References

California Building Standards Commission. 2016 California Fire Code. July 2016.

City of Mountain View. Sewer Master Plan. Prepared by Infrastructure Engineering Corporation. August 2010.

City of Mountain View. Water Master Plan. Prepared by Infrastructure Engineering Corporation. August 2010.

City of Palo Alto. Long Range Facilities Plan for the Regional Water Quality Control Plant. Prepared by Carollo. October 2012.

Infrastructure Engineering Corporation. General Plan Update Utility Impact Study. October 2011.

Schaaf & Wheeler. North Bayshore Precise Plan Phase II Utility Impact Study. October 2016.

Schaaf & Wheeler. 2030 General Plan – Updated Water System Modeling Alternative 1. November 2014.

APPENDIX A:

Additional Considered Projects

Table A-1: Additional Considered Projects for Future Cumulative Condition

	Project	Change Area/Planning Area	Address	Status*
1	Mountain View Co-Housing Community	Central Neighborhood	445 Calderon Ave	Completed
2	Hope Street Investors	Downtown/Evelyn Corridor	231-235 Hope St	Under Building Review
3	Downtown Mixed Use Building	Downtown/Evelyn Corridor	605 Castro St	Completed
4	Residential Condominium Project	Downtown/Evelyn Corridor	325, 333, 339 Franklin St	Under Review
5	St Joseph's Church	Downtown/Evelyn Corridor	599 Castro St	Completed
6	Fairmont Mixed Use	Downtown/Evelyn Corridor	881 Castro Street	Under Building Review
7	Bryant/Dana Office	Downtown/Evelyn Corridor	250 Bryant St	Completed
8	Quad/Lovewell	East Whisman	369 N Whisman Rd	Approved but Inactive
9	Renault & Handley	East Whisman	625-685 Clyde Ave	Completed
10	Symantec	East Whisman	575 E Middlefield Rd	On Hold
11	LinkedIn	East Whisman	700 E Middlefield Rd	Under Building Review
12	National Avenue Partners	East Whisman	600 National Ave	Completed
13	2700 West El Camino Real	El Camino Real	2700 El Camino Real W	Under Building Review
14	SummerHill Apt	El Camino Real	2650 El Camino Real W	Completed
15	Hotel Expansion	El Camino Real	2300 W El Camino Real	Under Building Review
16	Lennar Multi-Family Communities	El Camino Real	2268 El Camino Real W	Under Construction
17	UDR	El Camino Real	1984 El Camino Real W	Completed
18	Residence Inn Gatehouse	El Camino Real	1854 El Camino Real W	Under Building Review
19	Residence Inn	El Camino Real	1740 El Camino Real W	Completed
20	Tropicana Lodge - Prometheus	El Camino Real	1720 El Camino Real W	Completed
21	Austin's - Prometheus	El Camino Real	1616 El Camino Real W	Completed
22	1701 W El Camino Real	El Camino Real	1701 El Camino Real W	Under Construction
23	First Community Housing	El Camino Real	1585 El Camino Real W	Completed
24	Harv's Car Wash - Regis House	El Camino Real	1101 El Camino Real W	Completed
25	Greystar	El Camino Real	801 El Camino Real W	Completed
26	Medical Building	El Camino Real	412 El Camino Real W	Completed
27	Lennar Apartments	El Camino Real	865 El Camino Real E	Completed

**Source: City of Mountain View Planning Division Current Project List (City of Mountain View, February 2019)*

Table A-1: Additional Considered Projects for Future Cumulative Condition

	Project	Change Area/Planning Area	Address	Status*
28	Wonder Years Preschool	El Camino Real	86 El Camino Real	Under Construction
29	Evelyn Family Apartments	Grant/Sylvan	779 East Evelyn Ave	Under Construction
30	344 Bryant Ave	Grant/Sylvan	344 Bryant Ave	Under Building Review
31	Adachi Project	Grant/Sylvan	1991 Sun Mor Ave	Completed
32	840 E El Camino Real	Grant/Sylvan	840 El Camino Real E	Approved
33	Loop Convenience Store	Grant/Sylvan	790 El Camino Real E	Completed
34	El Camino Real Hospital Campus	Miramonte/Springer	2500 Grant Ave	Under Construction
35	City Sports	Miramonte/Springer	1040 Grant Ave	Completed
36	Prometheus	Moffett/Whisman	100 Moffett Blvd	Completed
37	Hampton Inn Addition	Moffett/Whisman	390 Moffett Blvd	Completed
38	Calvano Development	Moffett/Whisman	1075 Terra Bella Avenue	Under Building Review
39	Moffett Gateway	Moffett/Whisman	750 Moffett Blvd	Under Construction
40	Holiday Inn Express	Moffett/Whisman	870 Leong Dr	Approved
41	Warmington Residential	Moffett/Whisman	660 Tyrella Avenue	Under Construction
42	Dividend Homes	Moffett/Whisman	111 and 123 Fairchild Dr	Completed
43	133-149 Fairchild Dr	Moffett/Whisman	133-149 Fairchild Dr	Completed
44	Warmington Residential	Moffett/Whisman	277 Fairchild Dr	Under Construction
45	Hetch-Hetchy Property	Moffett/Whisman	450 N Whisman Dr	Completed
46	DeNardi Homes	Moffett/Whisman	186 East Middlefield Road	Under Building Review
47	Tripointe Homes	Moffett/Whisman	135 Ada Ave	Completed
48	Tripointe Homes	Moffett/Whisman	129 Ada Ave	Completed
49	Robson Homes	Moffett/Whisman	137 Easy St	Completed
50	167 N Whisman Rd	Moffett/Whisman	167 N Whisman Rd	Approved
51	Antenna Farm (Pacific Dr)	Moffett/Whisman	Pacific Dr	Completed
52	Pulte Homes	Moffett/Whisman	100, 420-430 Ferguson Dr	Under Construction
53	EFL Development	Moffett/Whisman	500 Ferguson Dr	Under Construction
54	Shenandoah Square Precise Plan	Moffett/Whisman	500 Moffett Blvd	On Hold

**Source: City of Mountain View Planning Division Current Project List (City of Mountain View, February 2019)*

Table A-1: Additional Considered Projects for Future Cumulative Condition

	Project	Change Area/Planning Area	Address	Status*
55	1185 Terra Bella Ave	Moffett/Whisman	1185 Terra Bella Ave	Approved
56	Linde Hydrogen Fueling Station	Moffett/Whisman	830 Leong Dr	Completed
57	Windsor Academy	Monta Loma/Farley/Rock	908 N Rengstorff Ave	Completed
58	D.R. Horton	Monta Loma/Farley/Rock	827 N Rengstorff Ave	Completed
59	ROEM/Eden	Monta Loma/Farley/Rock	819 N Rengstorff Ave	Completed
60	Paul Ryan	Monta Loma/Farley/Rock	858 Sierra Vista Ave	Under Building Review
61	William Lyon Homes	Monta Loma/Farley/Rock	1951 Colony St	Completed
62	Dividend Homes	Monta Loma/Farley/Rock	1958 Rock St	Completed
63	Paul Ryan	Monta Loma/Farley/Rock	2392 Rock St	Completed
64	San Antonio Station	Monta Loma/Farley/Rock	100 & 250 Mayfield Ave	Completed
65	Northpark Apartments	Monta Loma/Farley/Rock	111 N Rengstorff Ave	Completed
66	333 N Rengstorff Ave	Monta Loma/Farley/Rock	333 N Rengstorff Ave	Under Construction
67	Classic Communities	Monta Loma/Farley/Rock	1946 San Luis Ave	Completed
68	1998-2024 Montecitio Ave	Monta Loma/Farley/Rock	1998-2024 Montecito Ave	Under Construction
69	Classic Communities	Monta Loma/Farley/Rock	647 Sierra Vista Ave	Completed
70	Dividend Homes	Monta Loma/Farley/Rock	1968 Hackett Ave & 208-210 Sierra Vista Ave	Completed
71	California Communities	Monta Loma/Farley/Rock	2025 & 2065 San Luis Ave	Under Construction
72	2044 and 2054 Montecito Ave	Monta Loma/Farley/Rock	2044 & 2054 Montecito Ave	Under Construction
73	Shorebreeze Apartments	Monta Loma/Farley/Rock	460 North Shoreline Blvd	Under Building Review
74	Intuit	North Bayshore	2600 Marine Way	Completed
75	Sobrato Organization	North Bayshore	1255 Pear Ave	Under Building Review
76	Charleston East	North Bayshore	2000 North Shoreline Blvd	Under Construction
77	LinkedIn and Sywest	North Bayshore	1400 North Shoreline Blvd	On Hold
78	Broadreach	North Bayshore	1625 Plymouth Street	Completed
79	Microsoft	North Bayshore	1045-1085 La Avenida St	Under Construction
80	Shashi Hotel	North Bayshore	1625 North Shoreline Blvd	Under Construction

**Source: City of Mountain View Planning Division Current Project List (City of Mountain View, February 2019)*

Table A-1: Additional Considered Projects for Future Cumulative Condition

	Project	Change Area/Planning Area	Address	Status*
81	Community School of Music and Art	San Antonio	250 San Antonio Circle	Approved
82	Prometheus	San Antonio	400 San Antonio Rd	Under Construction
83	Octane Fayette	San Antonio	2645 & 2655 Fayette Dr	Under Review
84	Merlone Geier Partners (MGP)	San Antonio	405 San Antonio Rd	Under Construction
85	Anton Calega	San Antonio/Rengstorff/ Del Medio	394 Ortega Ave	Under Construction
86	Barry Swenson Builder	San Antonio/Rengstorff/ Del Medio	1958 Latham St	Under Building Review
87	2296 Mora Drive	San Antonio/Rengstorff/ Del Medio	2296 Mora Dr	Under Construction

**Source: City of Mountain View Planning Division Current Project List (City of Mountain View, February 2019)*

APPENDIX B:

Figures

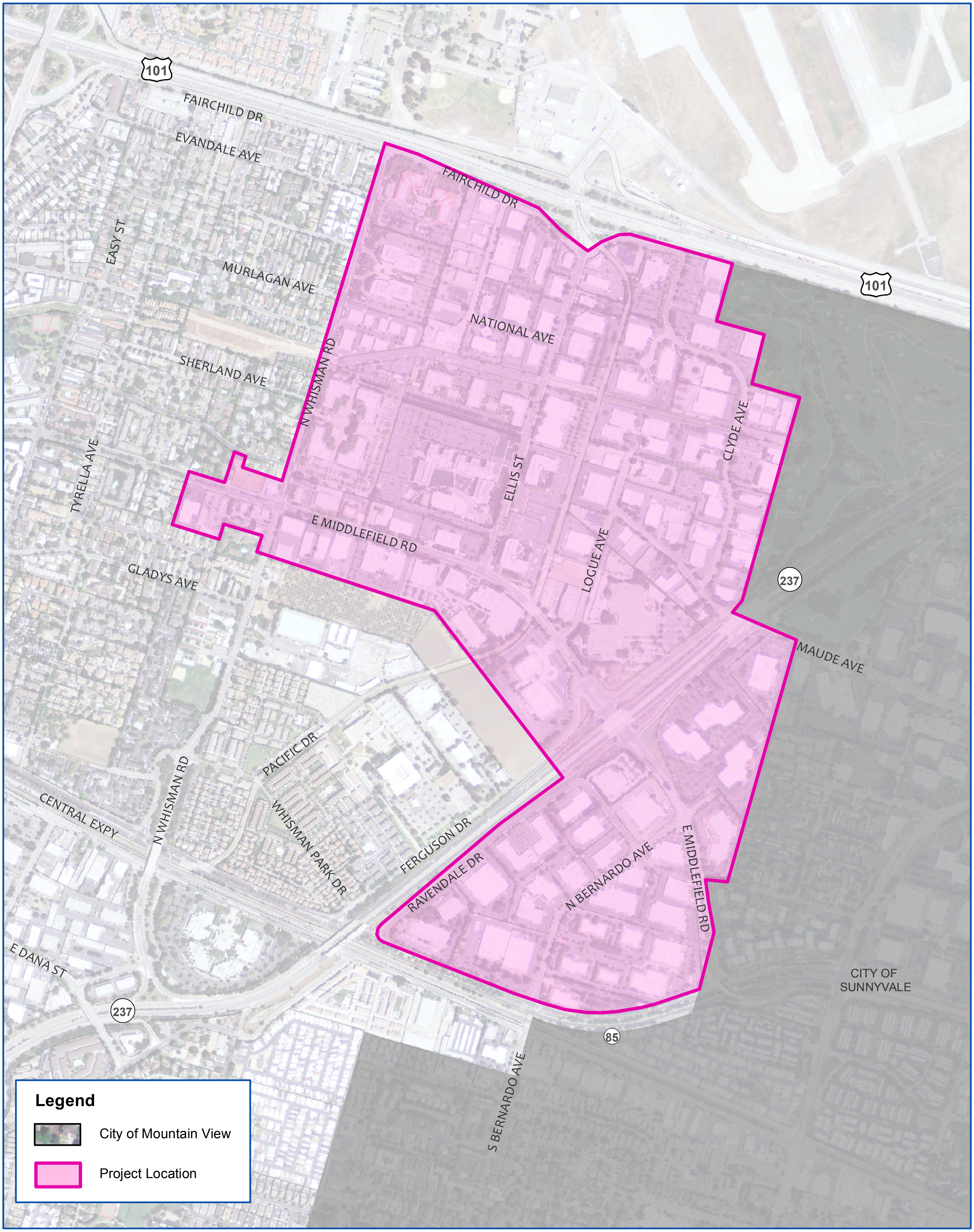

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FIGURE B-1: **Project Location**

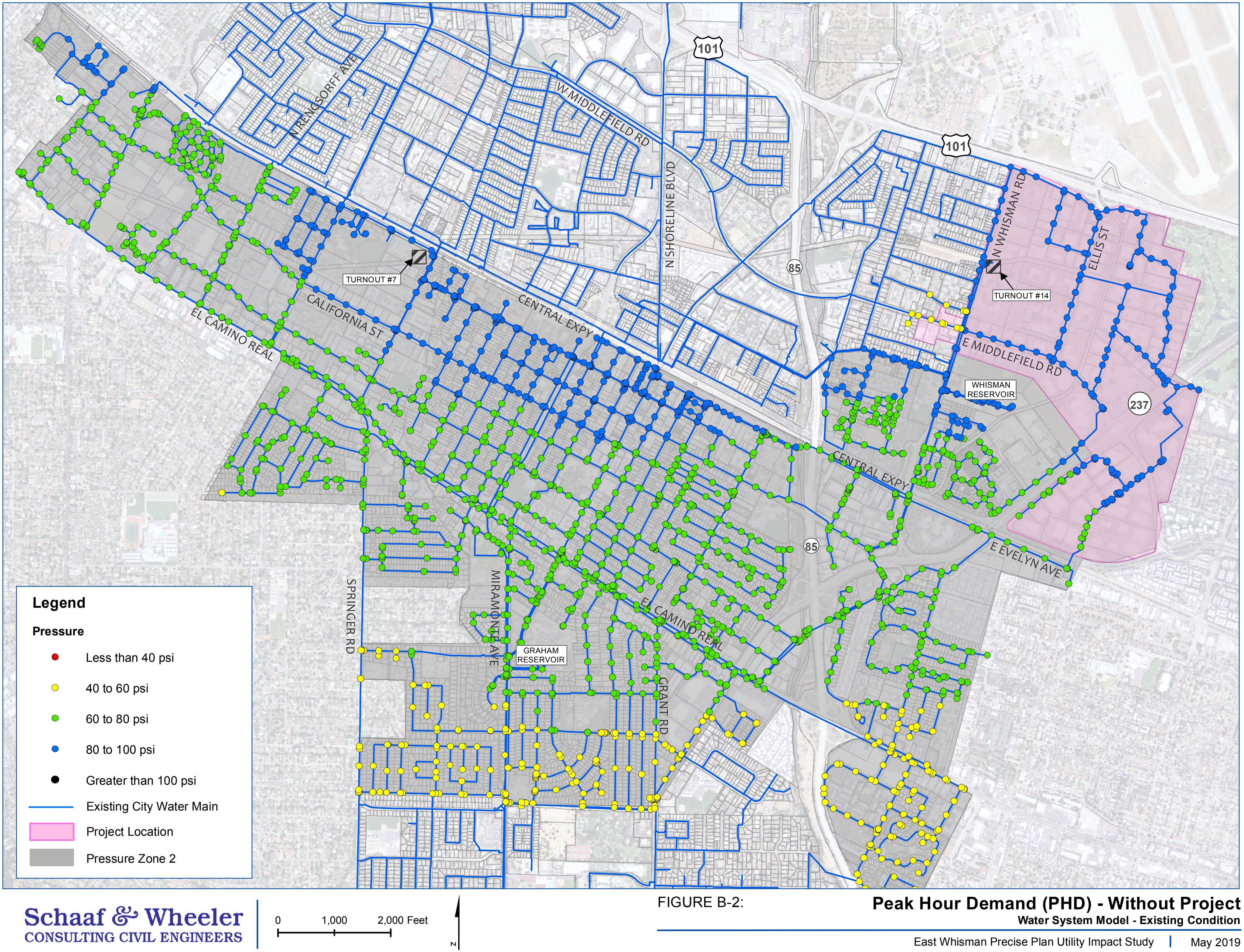

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FIGURE B-2:

Peak Hour Demand (PHD) - Without Project

Water System Model - Existing Condition

East Whisman Precise Plan Utility Impact Study | May 2019

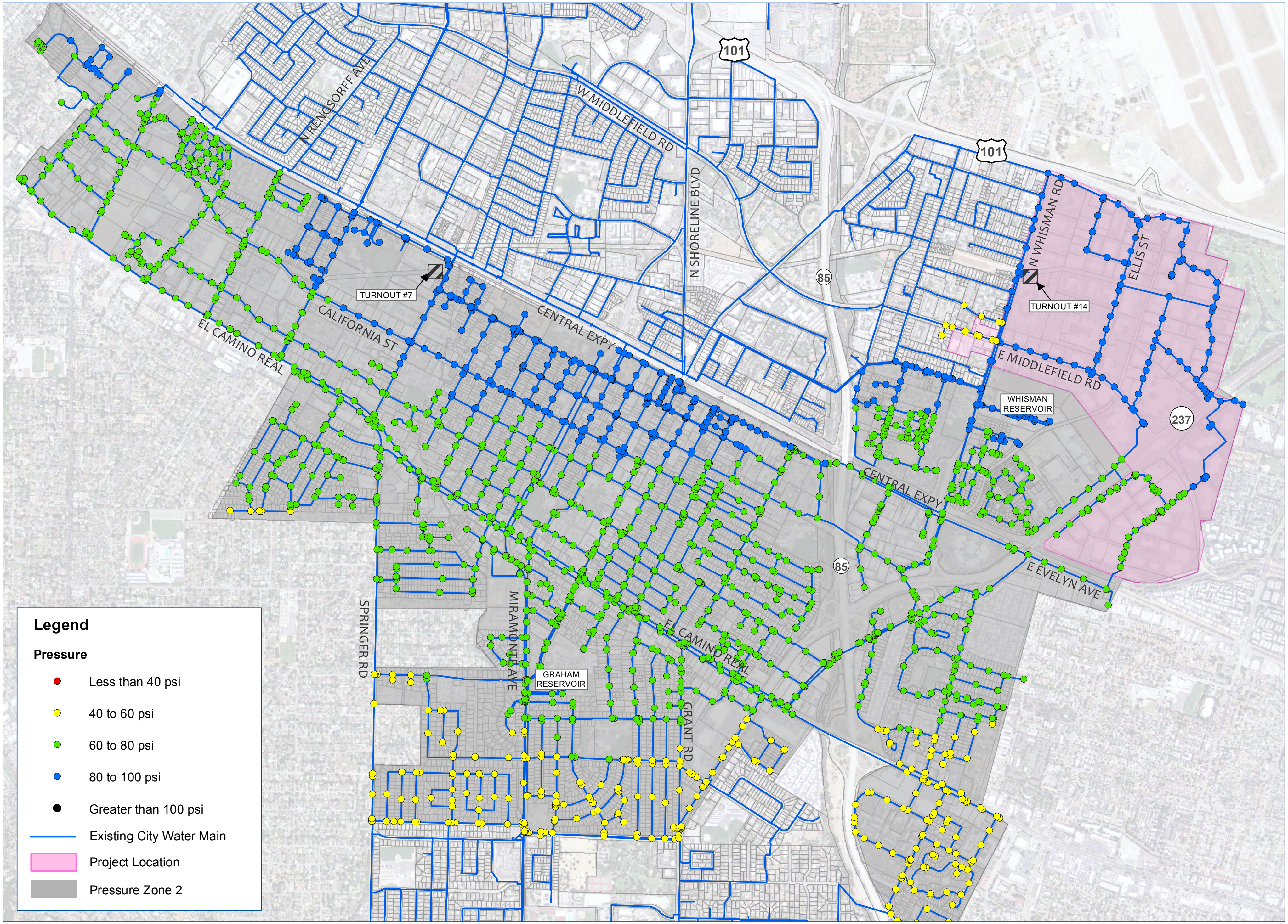

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FIGURE B-3:

Peak Hour Demand (PHD) - With Project

Water System Model - Existing Condition

East Whisman Precise Plan Utility Impact Study | May 2019

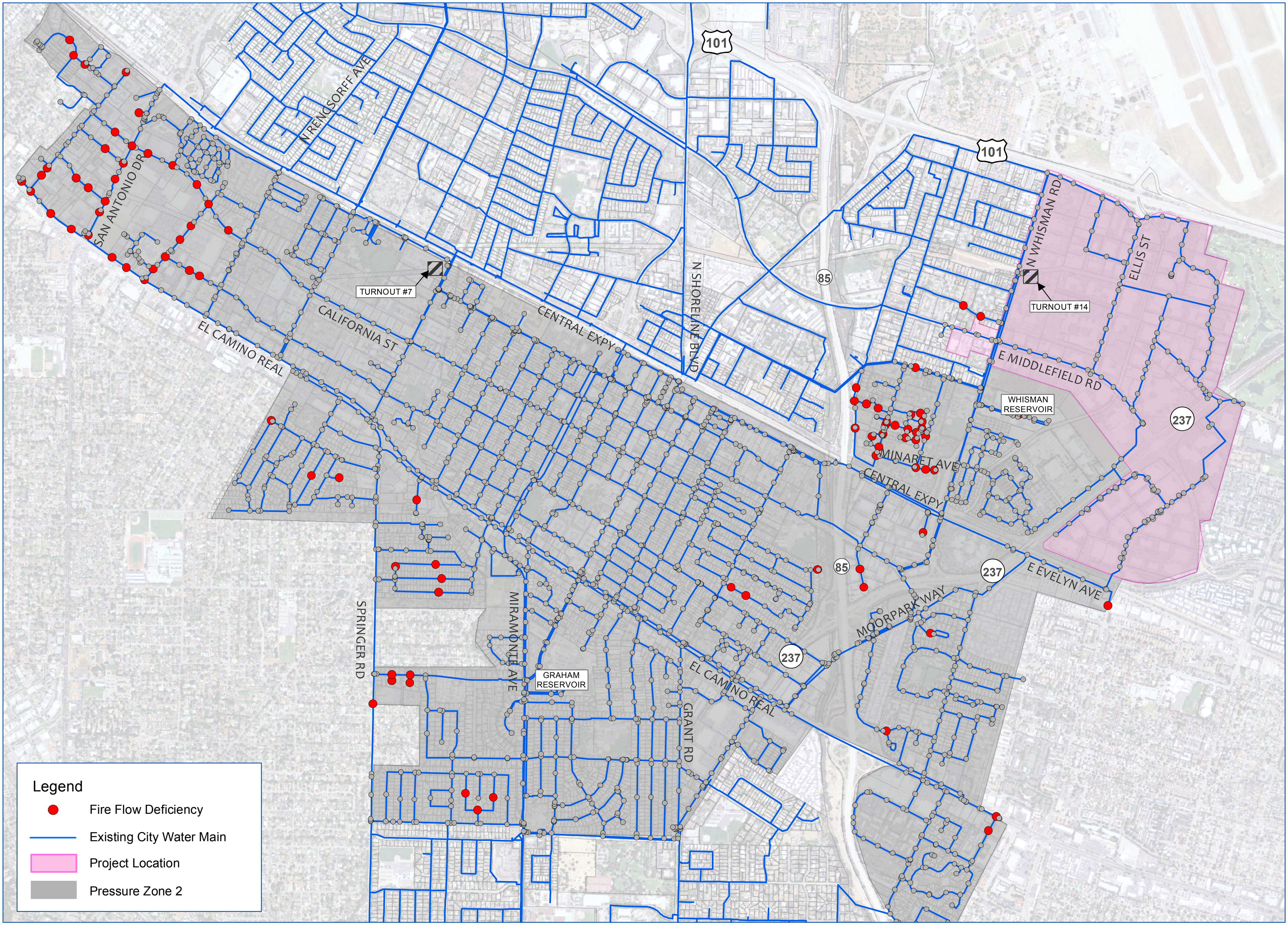

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FIGURE B-4:

Fire Flow Analysis - Without Project

Water System Model - Existing Condition

East Whisman Precise Plan Utility Impact Study | May 2019

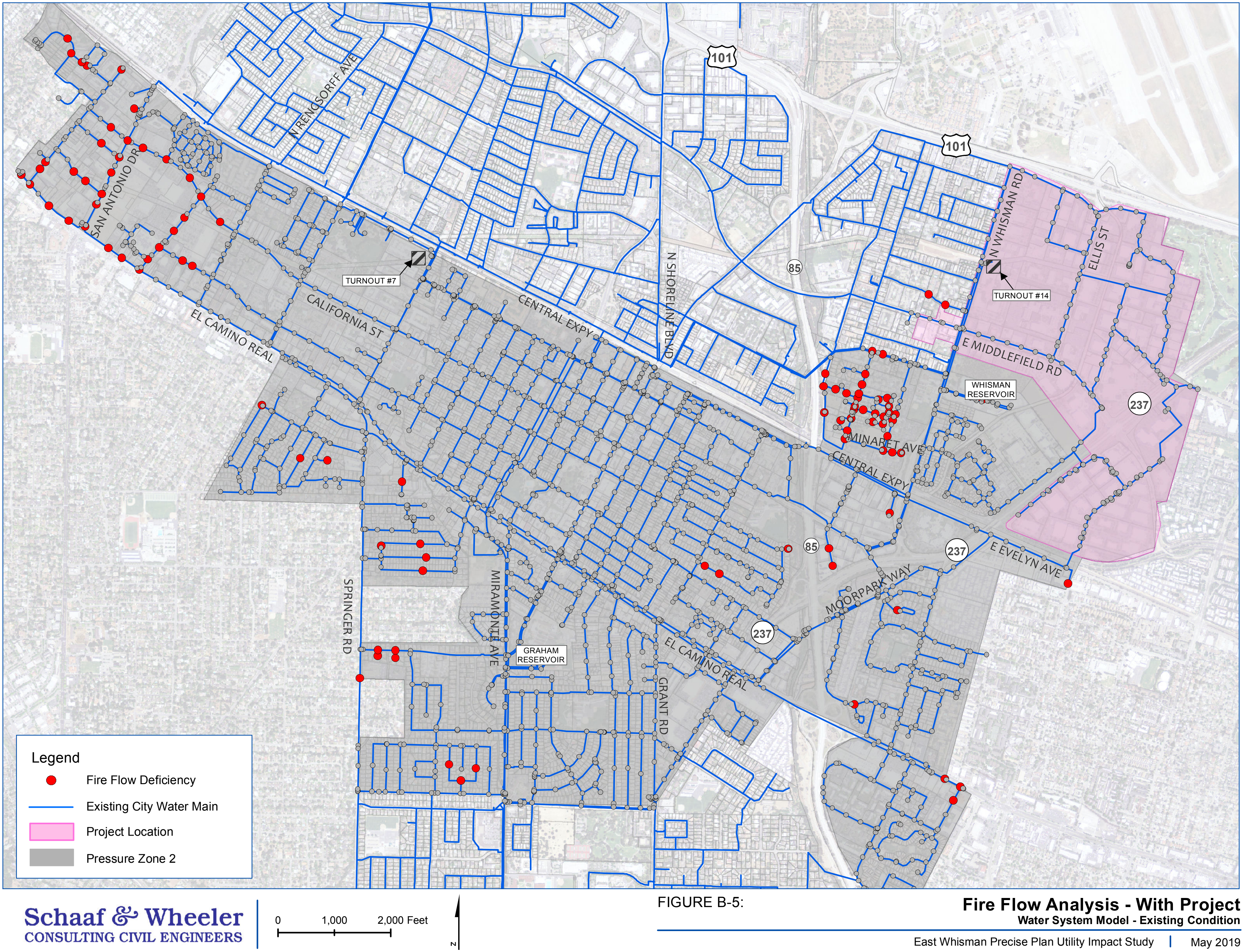

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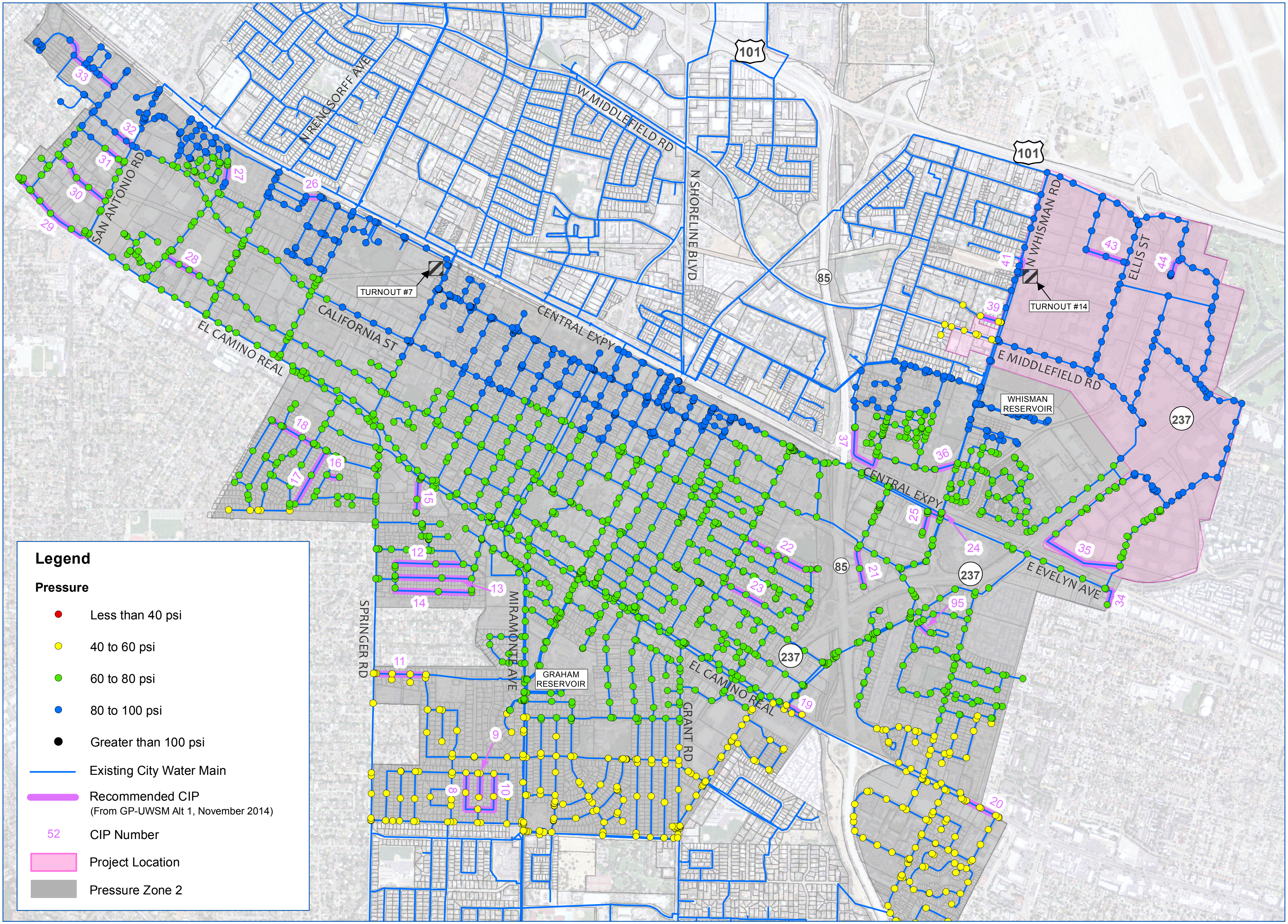
FIGURE B-5:

Fire Flow Analysis - With Project

Water System Model - Existing Condition

East Whisman Precise Plan Utility Impact Study | May 2019



Schaaf & Wheeler
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0 1,000 2,000 Feet

N

FIGURE B-6:

Peak Hour Demand (PHD) - Without Project

Water System Model - Future Cumulative Condition

East Whisman Precise Plan Utility Impact Study | May 2019

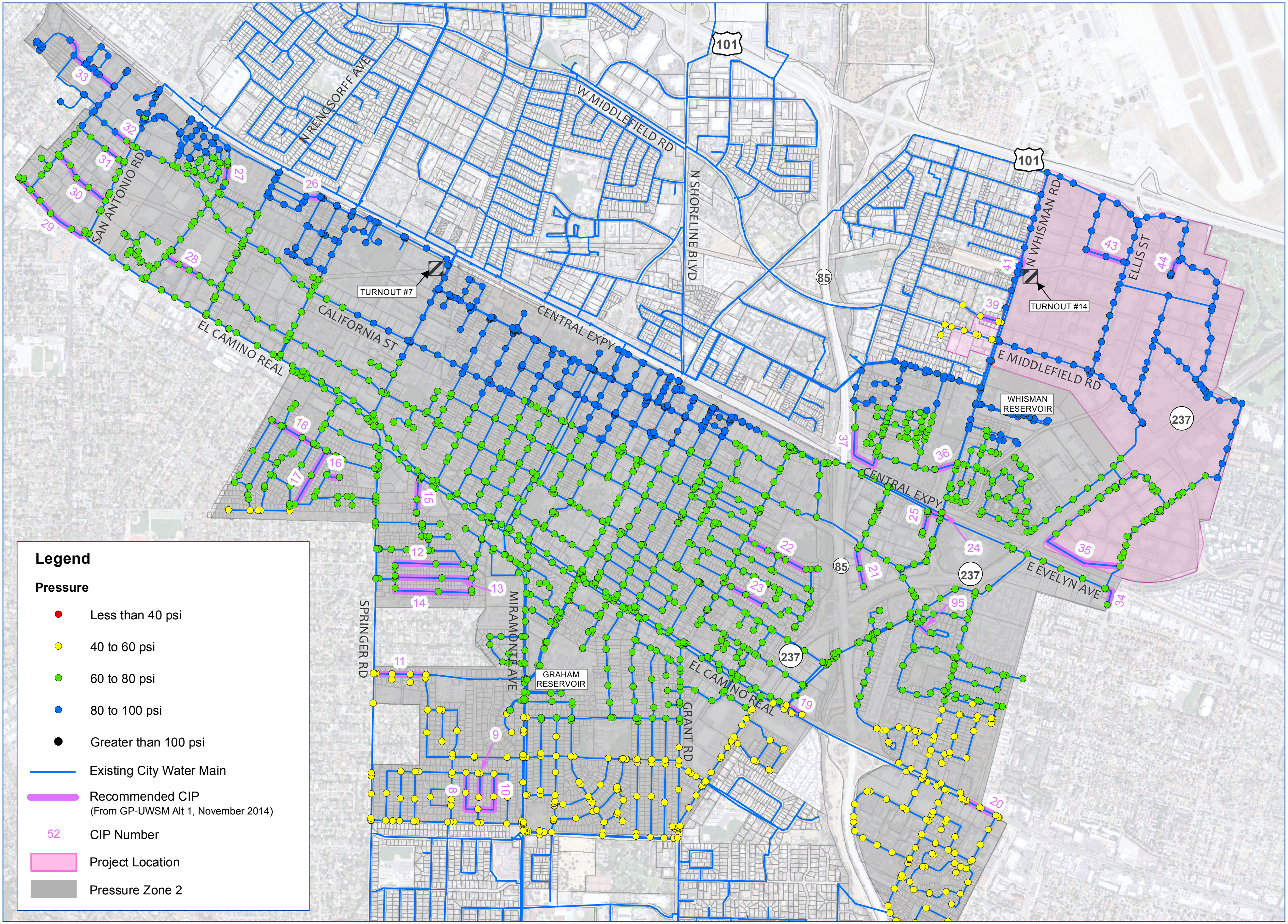

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FIGURE B-7:

Peak Hour Demand (PHD) - With Project

Water System Model - Future Cumulative Condition

East Whisman Precise Plan Utility Impact Study | May 2019

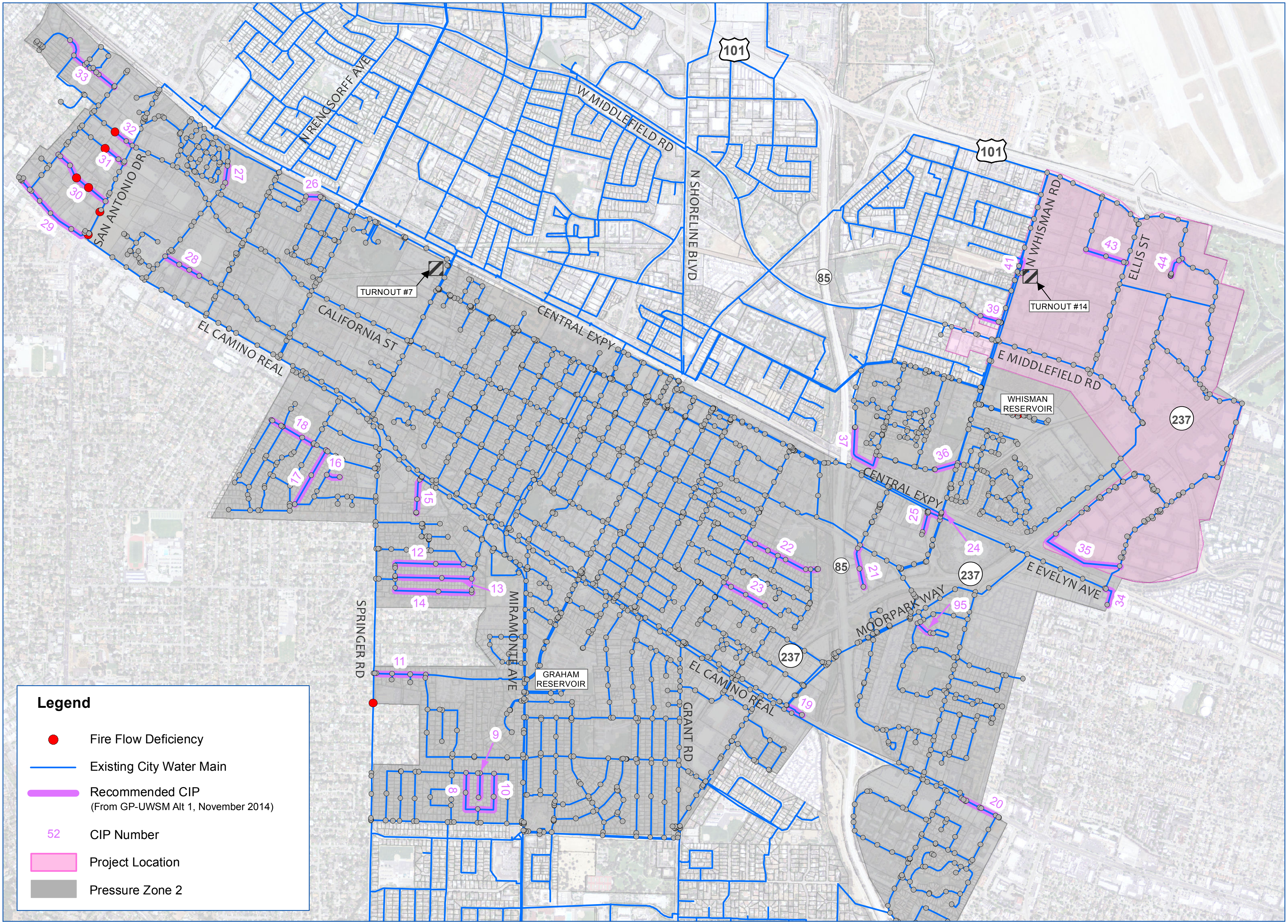

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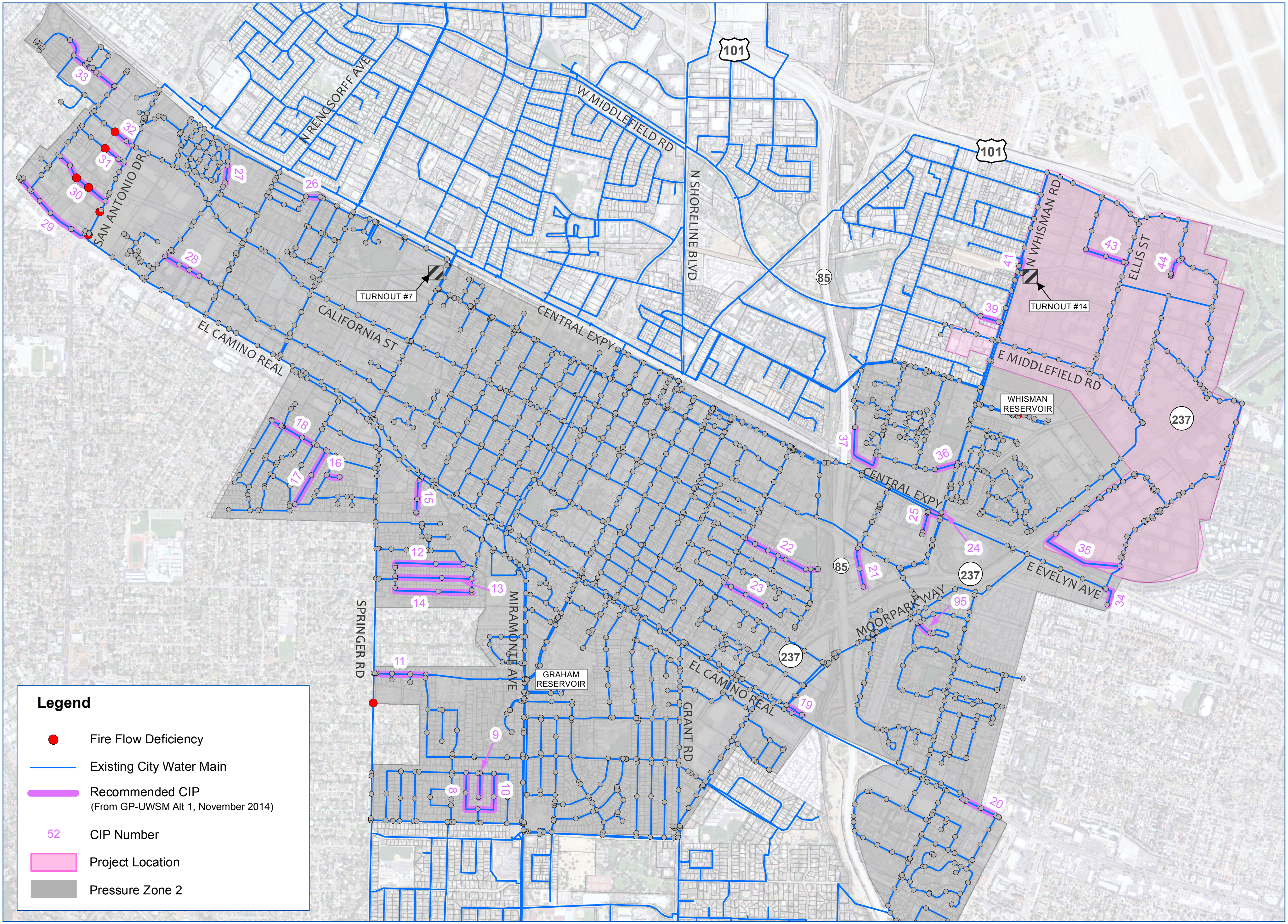
FIGURE B-8:

Fire Flow Analysis - Without Project

Water System Model - Future Cumulative Condition

East Whisman Precise Plan Utility Impact Study | May 2019



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0 1,000 2,000 Feet

N

FIGURE B-9:

Fire Flow Analysis - With Project

Water System Model - Future Cumulative Condition

East Whisman Precise Plan Utility Impact Study | May 2019

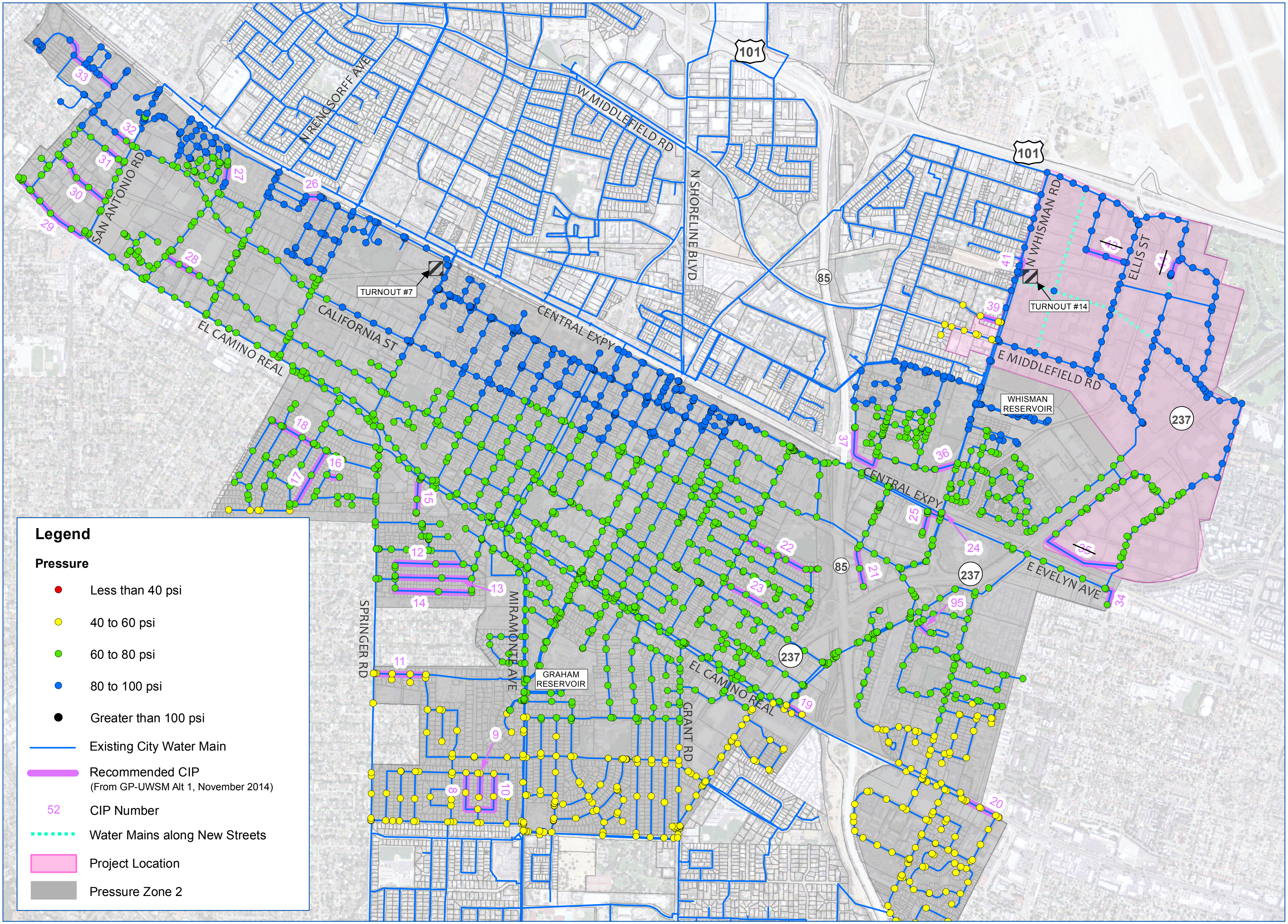

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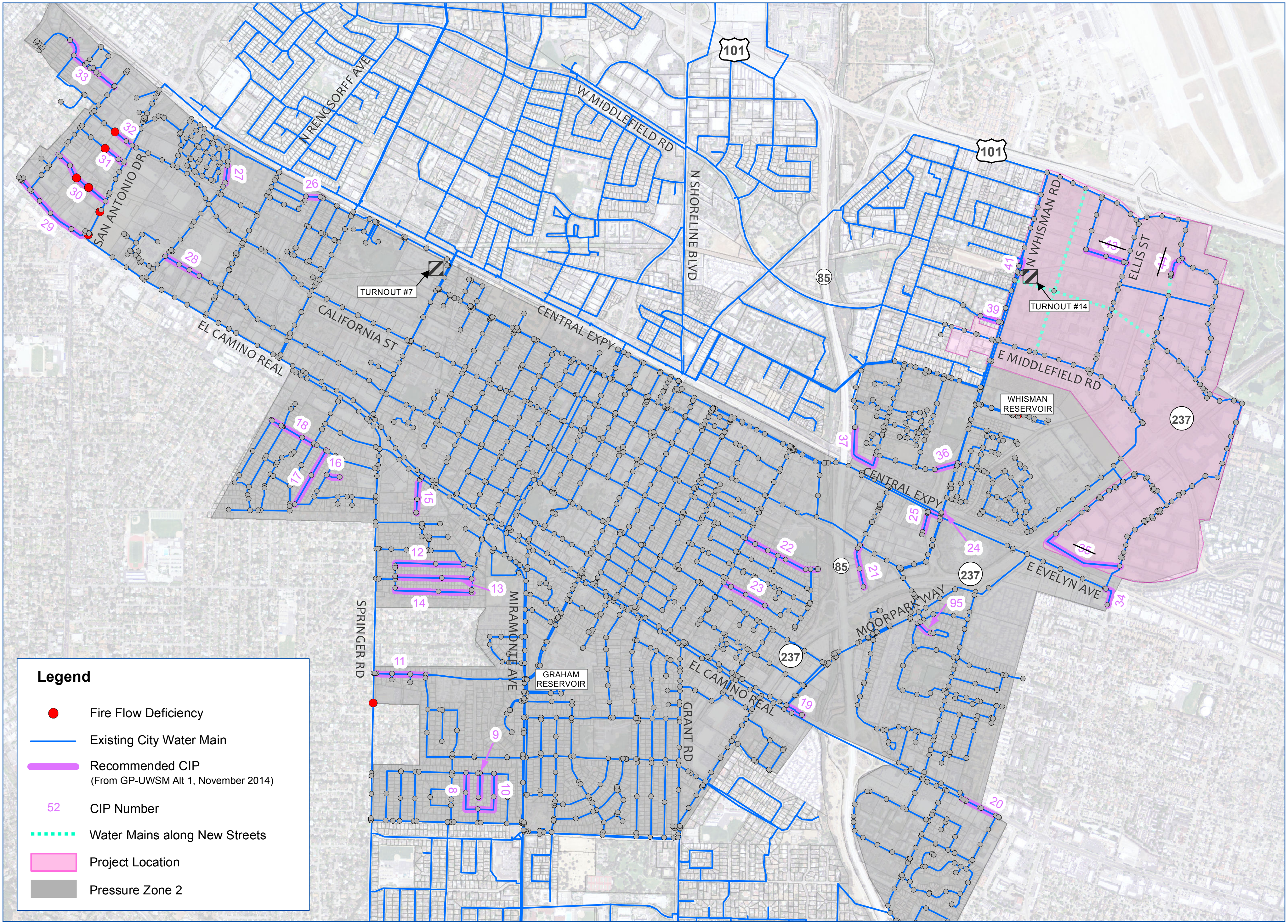
FIGURE B-10:

Peak Hour Demand (PHD) - With Project

Water System Model - Future Cumulative Condition - Proposed Streets

East Whisman Precise Plan Utility Impact Study | May 2019



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0 1,000 2,000 Feet

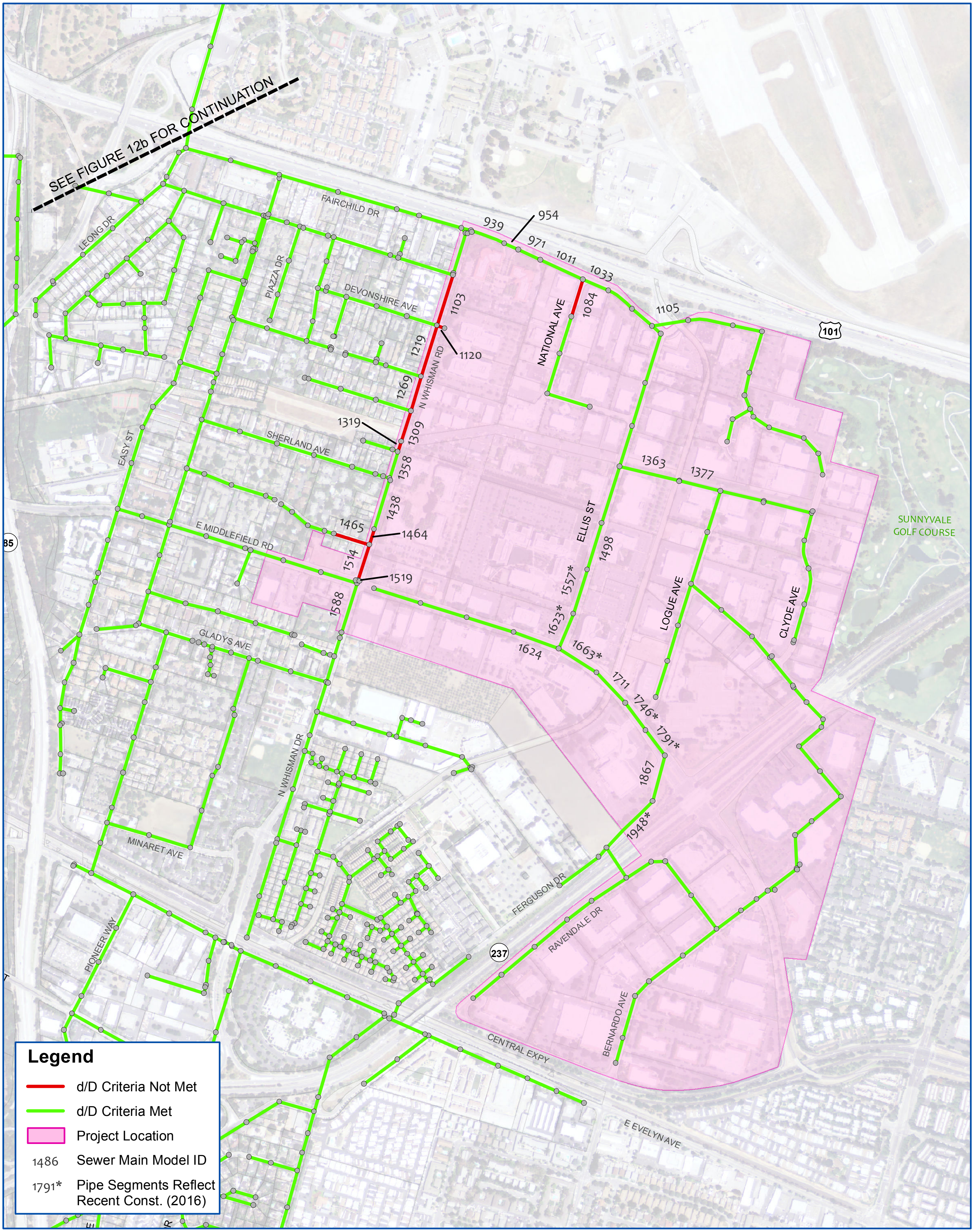
N

FIGURE B-11:

Fire Flow Analysis - With Project

Water System Model - Future Cumulative Condition - Proposed Streets

East Whisman Precise Plan Utility Impact Study | May 2019



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0 500 1,000 Feet

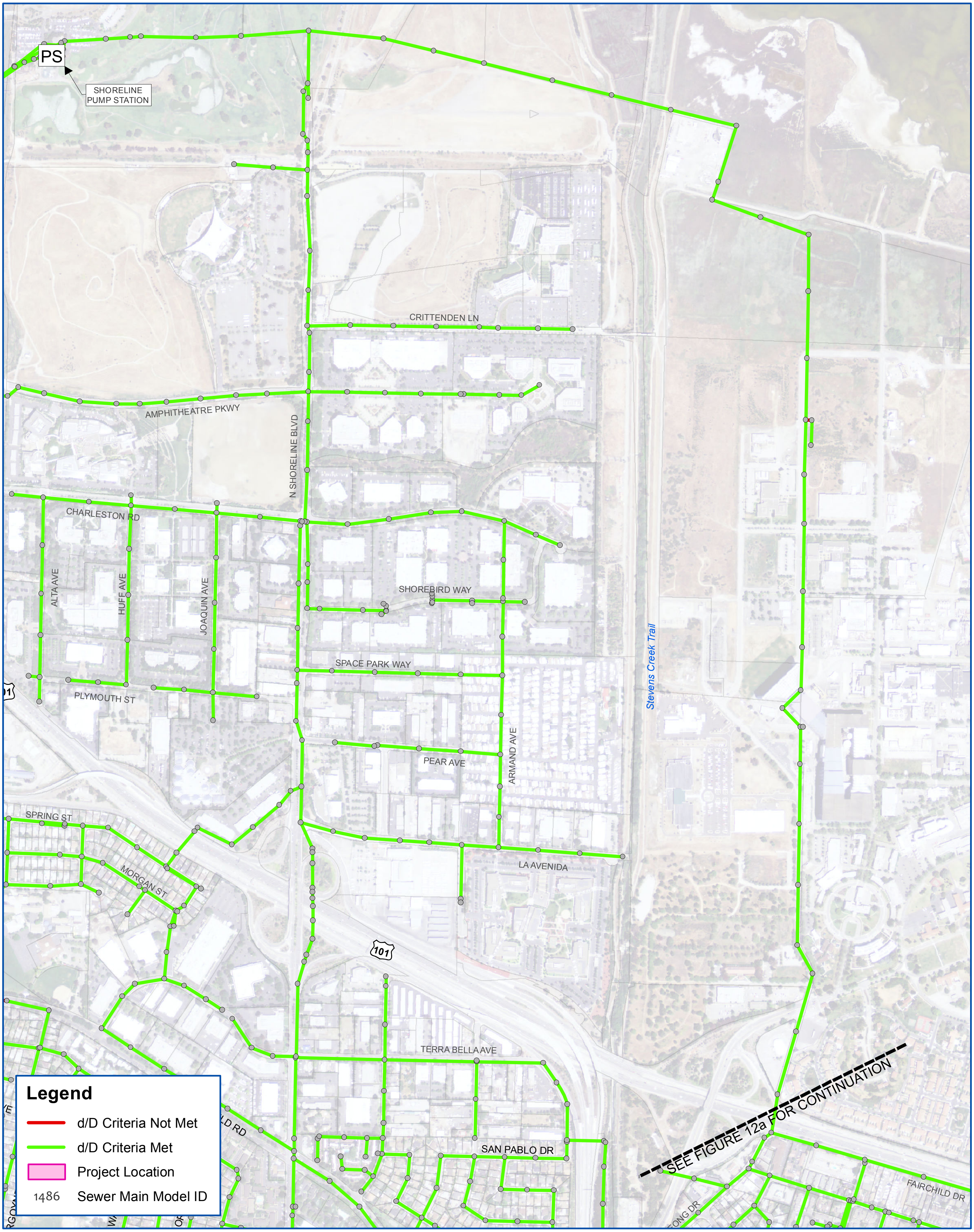
N

FIGURE B-12a:

PWWF - Without Project

Sewer System Model - Existing Condition

East Whisman Precise Plan Utility Impact Study | May 2019



Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS

0 500 1,000 Feet

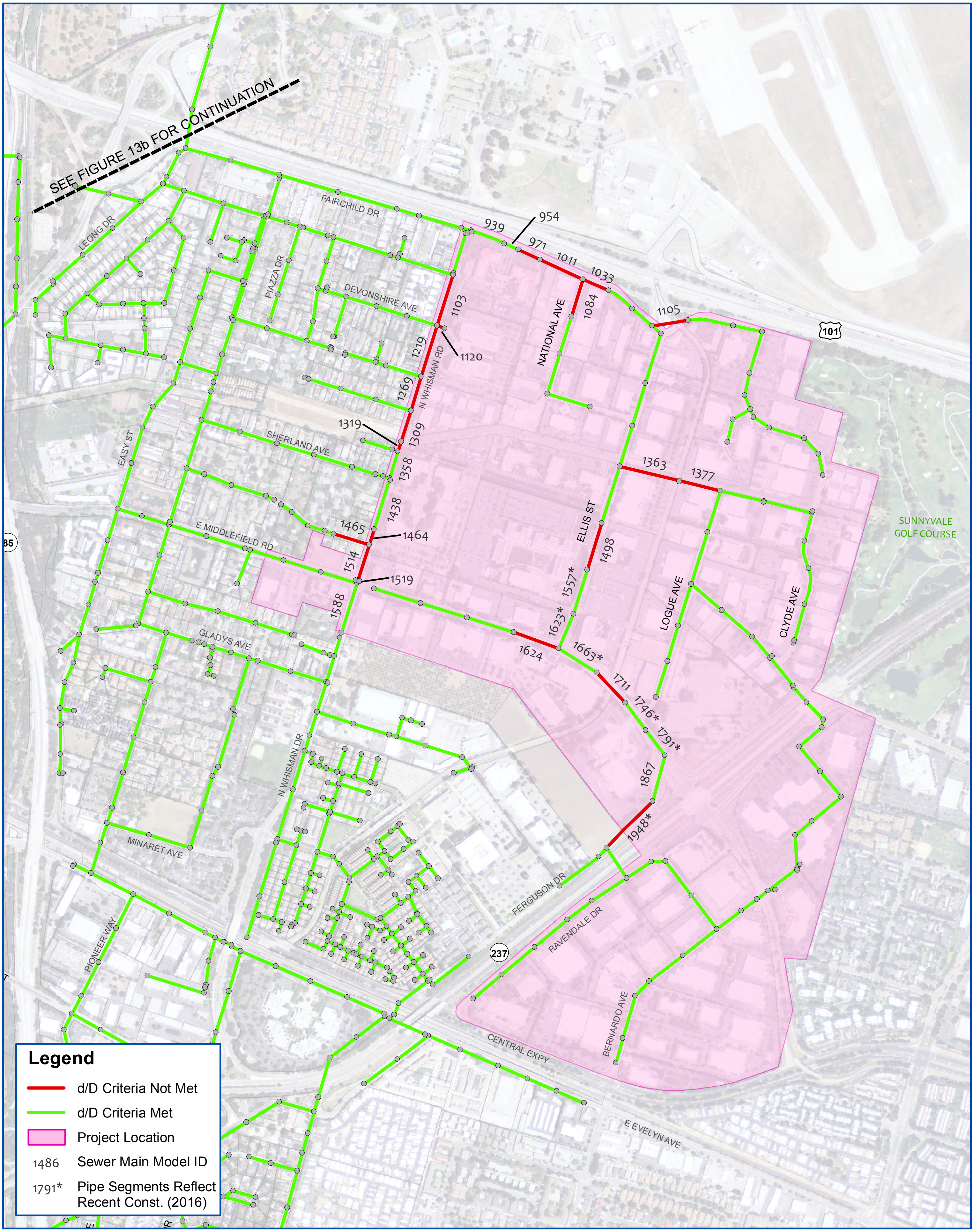
N

FIGURE B-12b:

PWWF - Without Project

Sewer System Model - Existing Condition

East Whisman Precise Plan Utility Impact Study | May 2019



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0 500 1,000 Feet

FIGURE B-13a:

PWWF - With Project

Sewer System Model - Existing Condition

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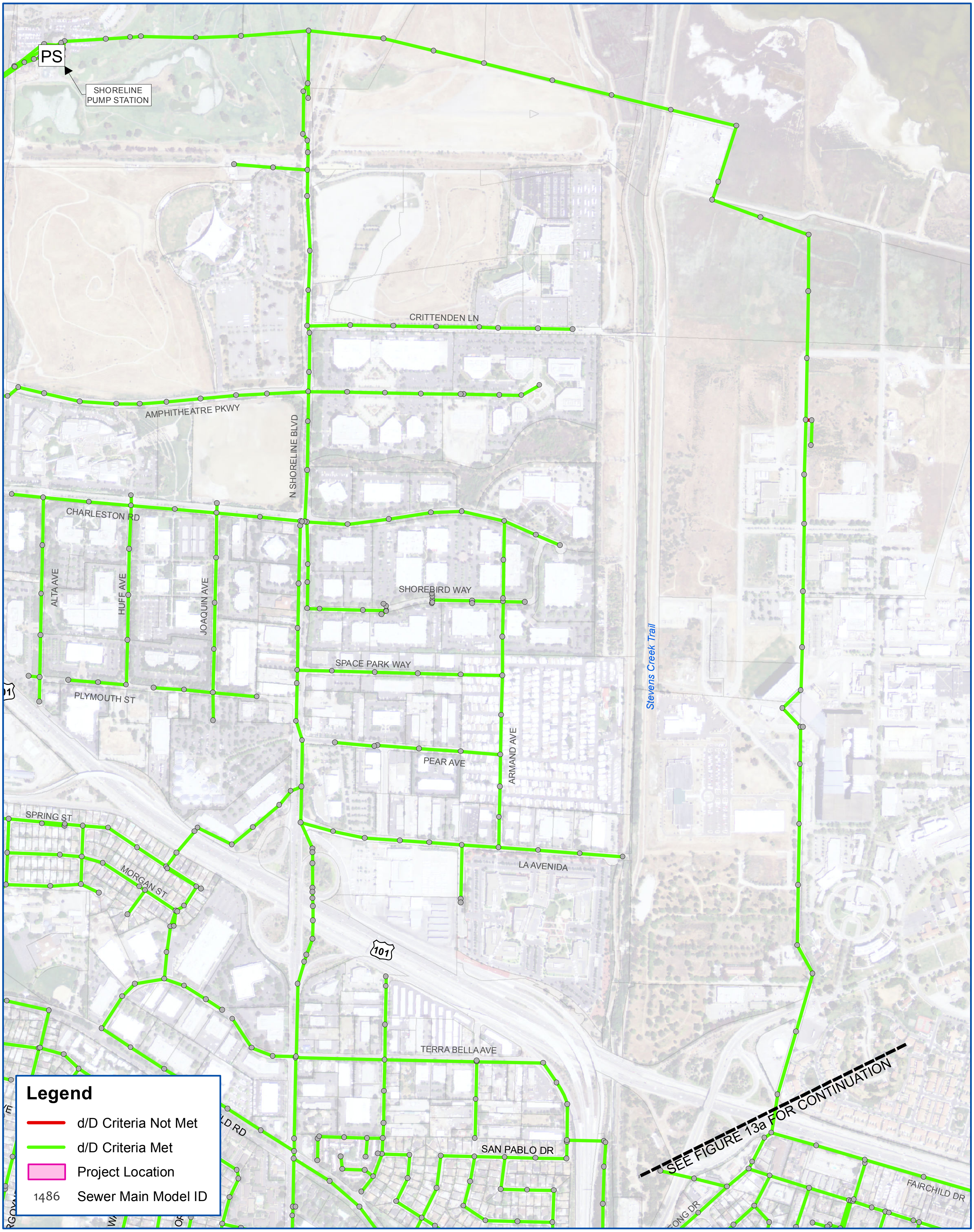

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FIGURE B-13b:

PWWF - With Project

Sewer System Model - Existing Condition

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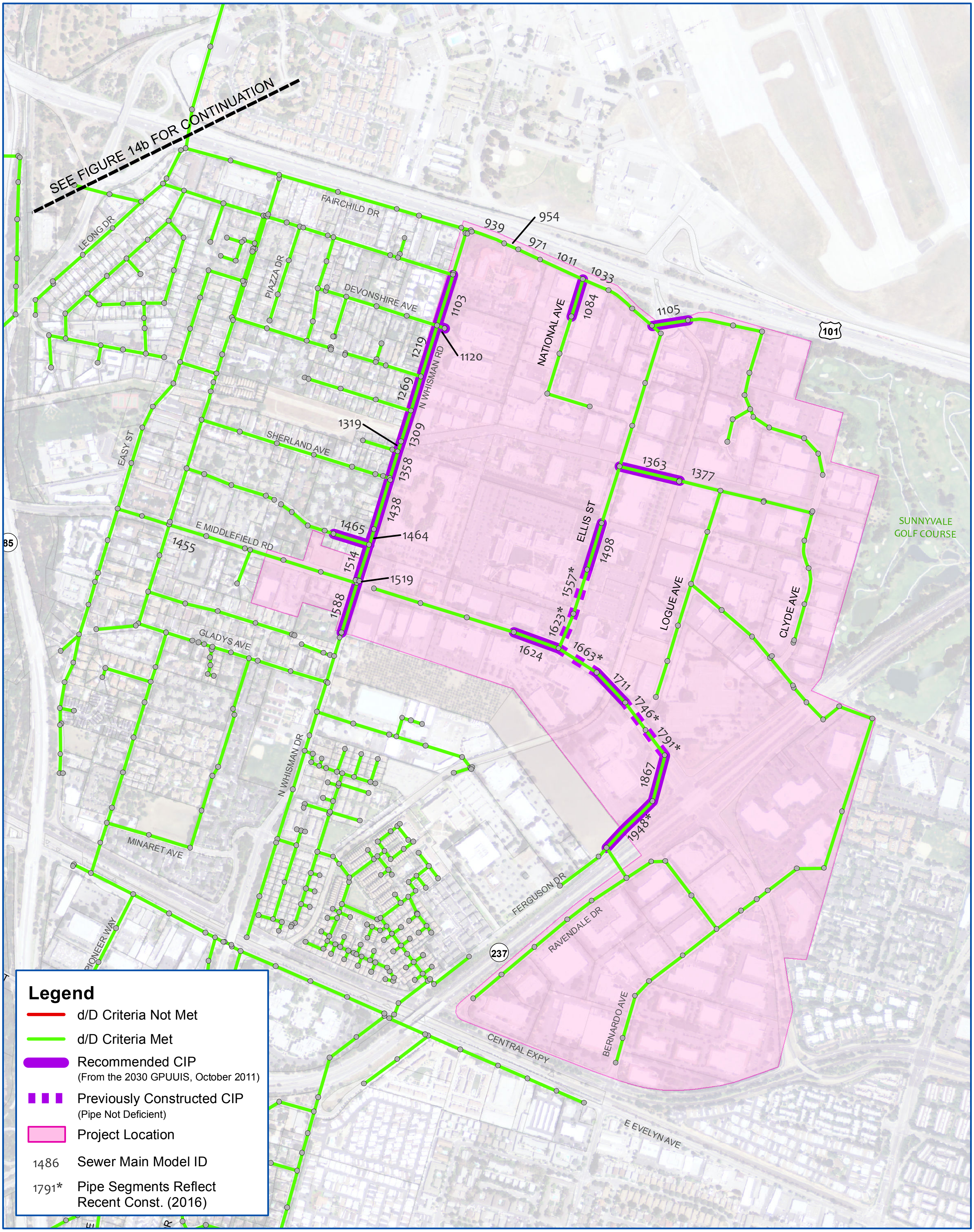

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0 500 1,000 Feet

FIGURE B-14a: **PWWF - Without Project**

Sewer System Model - Future Cumulative Condition

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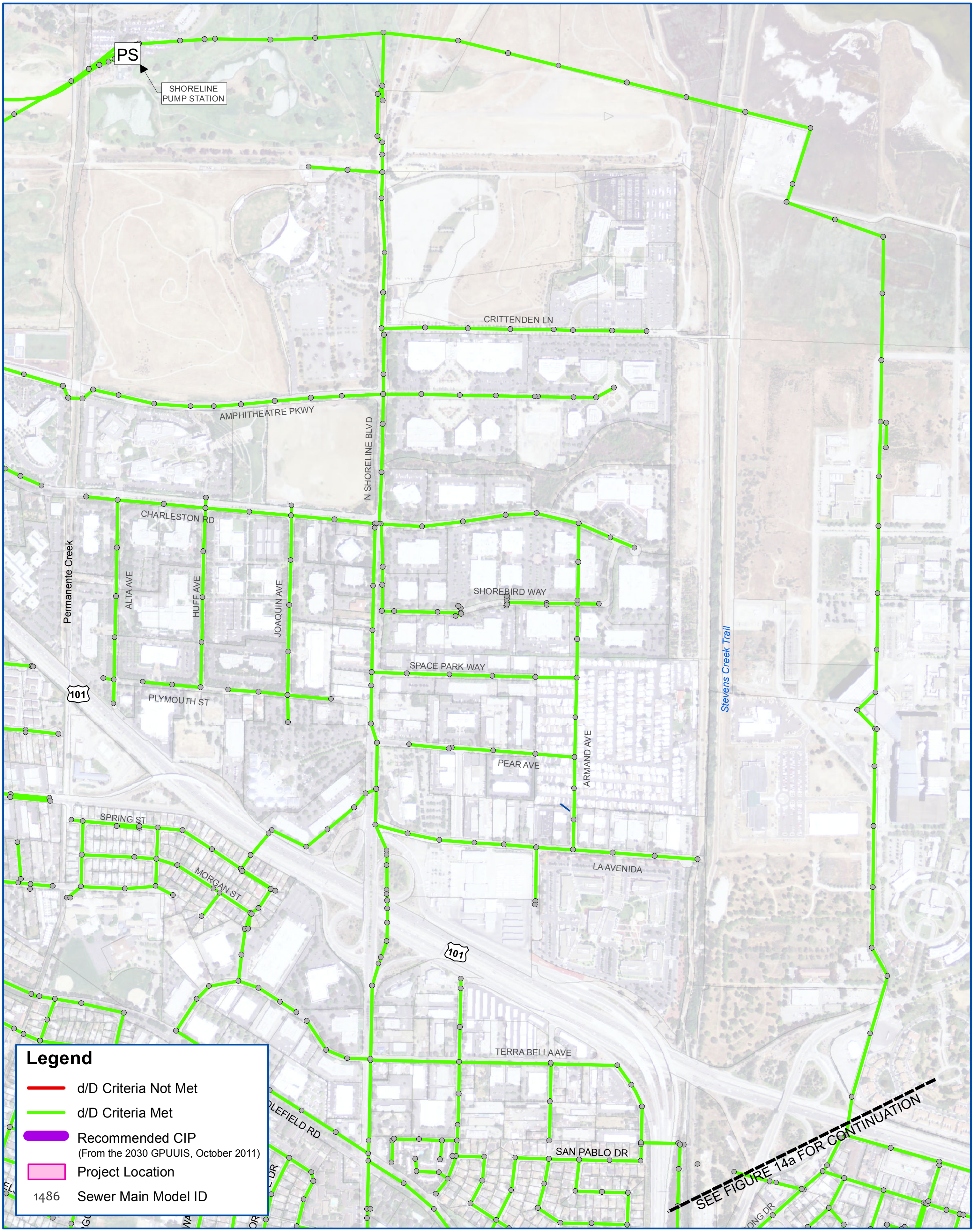

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FIGURE B-14b:

PWWF - With Project

Sewer System Model - Future Cumulative Condition

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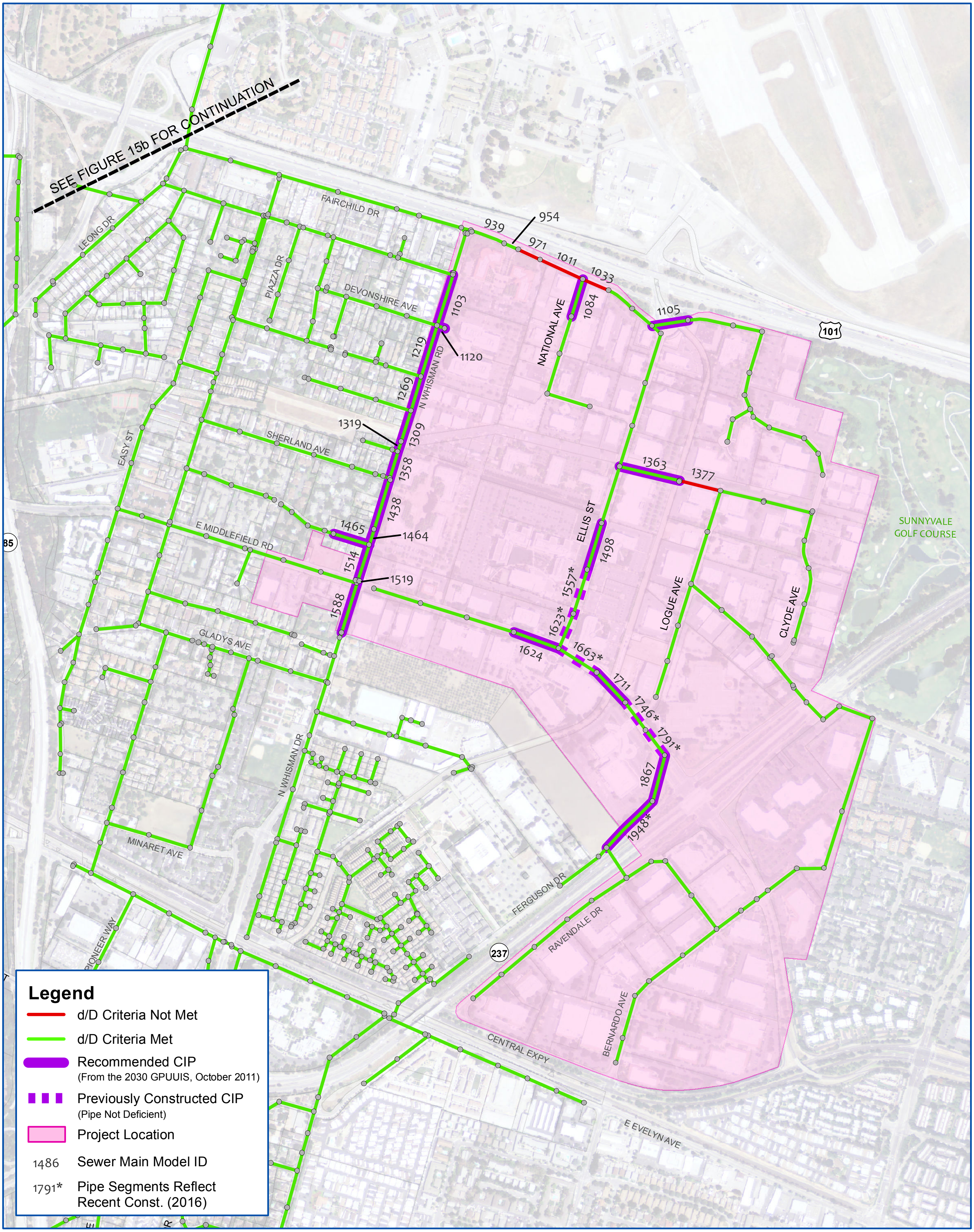

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0 500 1,000 Feet

N

FIGURE B-15a:

PWWF - With Project

Sewer System Model - Future Cumulative Condition

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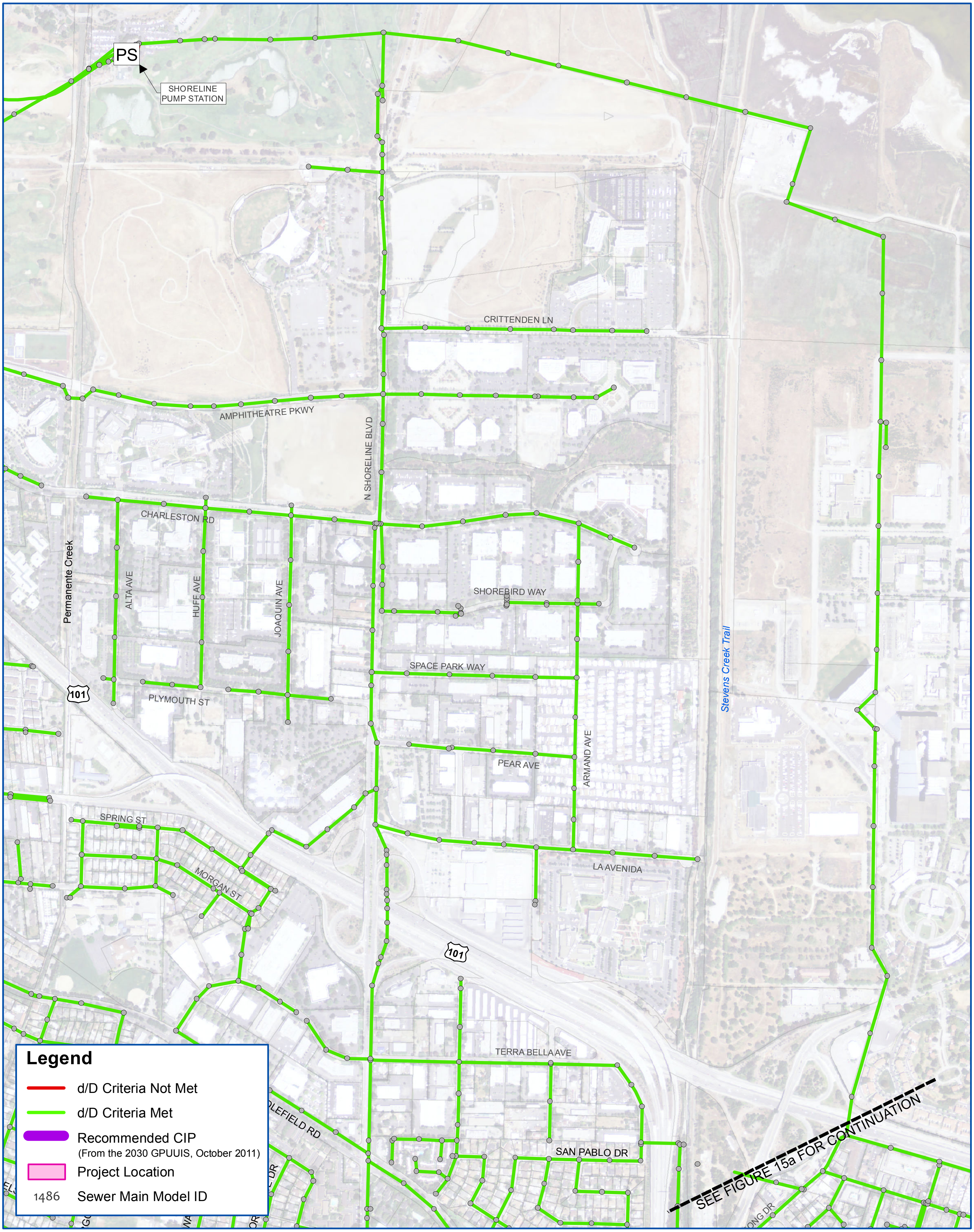

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FIGURE B-15b:

PWWF - With Project

Sewer System Model - Future Cumulative Condition

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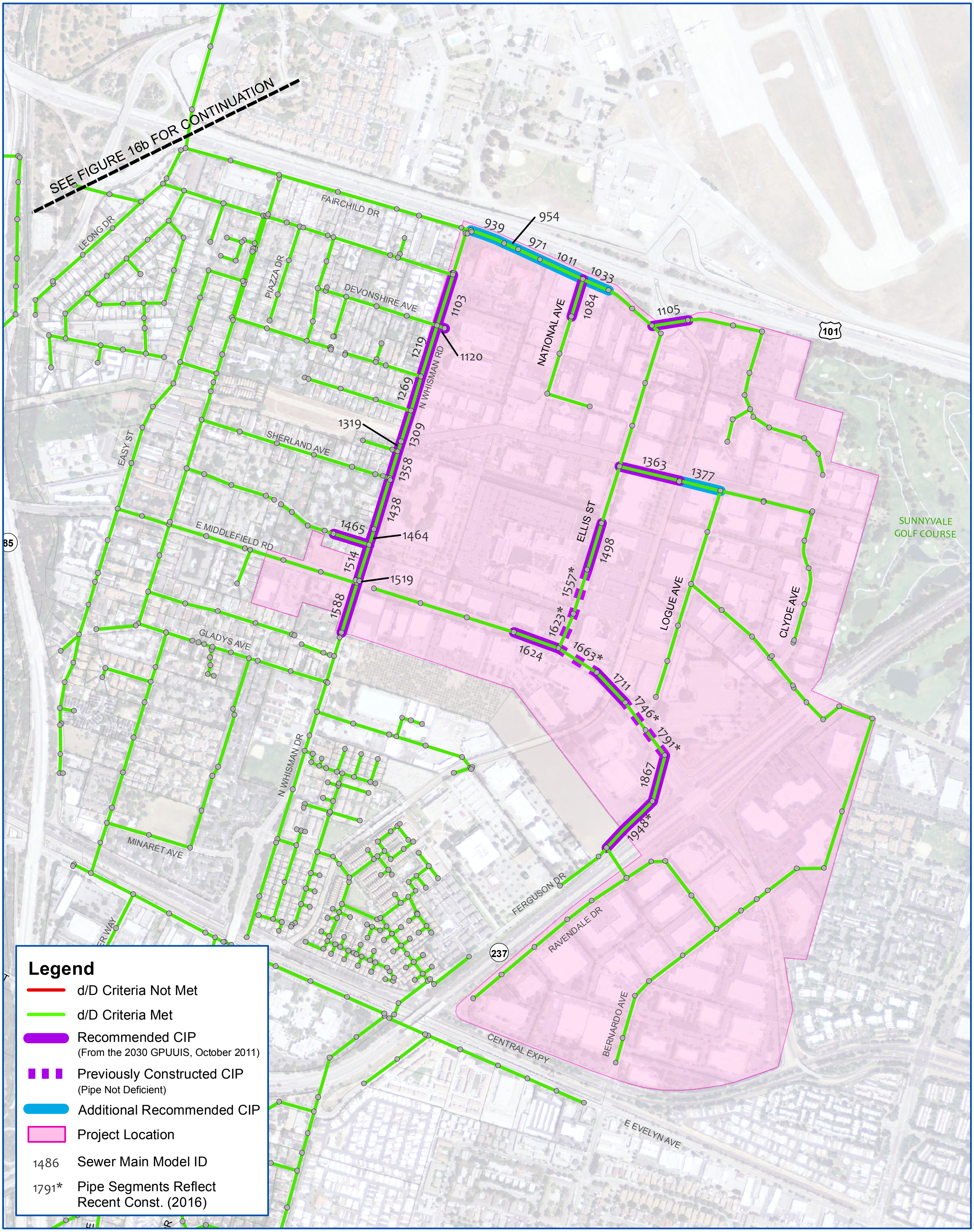

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0 500 1,000 Feet
N

FIGURE B-16a:

PWWF - With Project

Sewer System Model - Future Cumulative Condition

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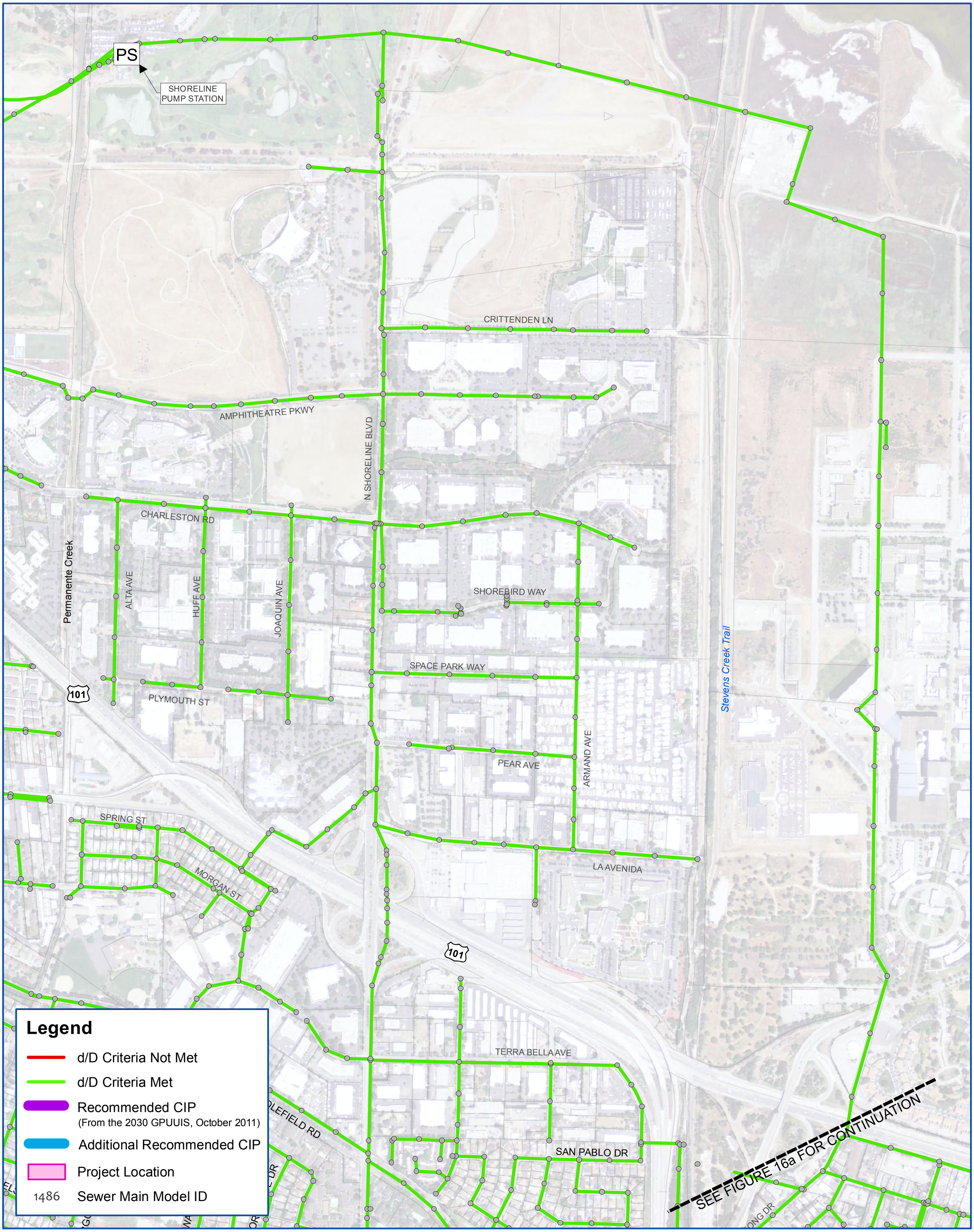

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FIGURE B-16b:

PWWF - With Project

Sewer System Model - Future Cumulative Condition

East Whisman Precise Plan Utility Impact Study | May 2019