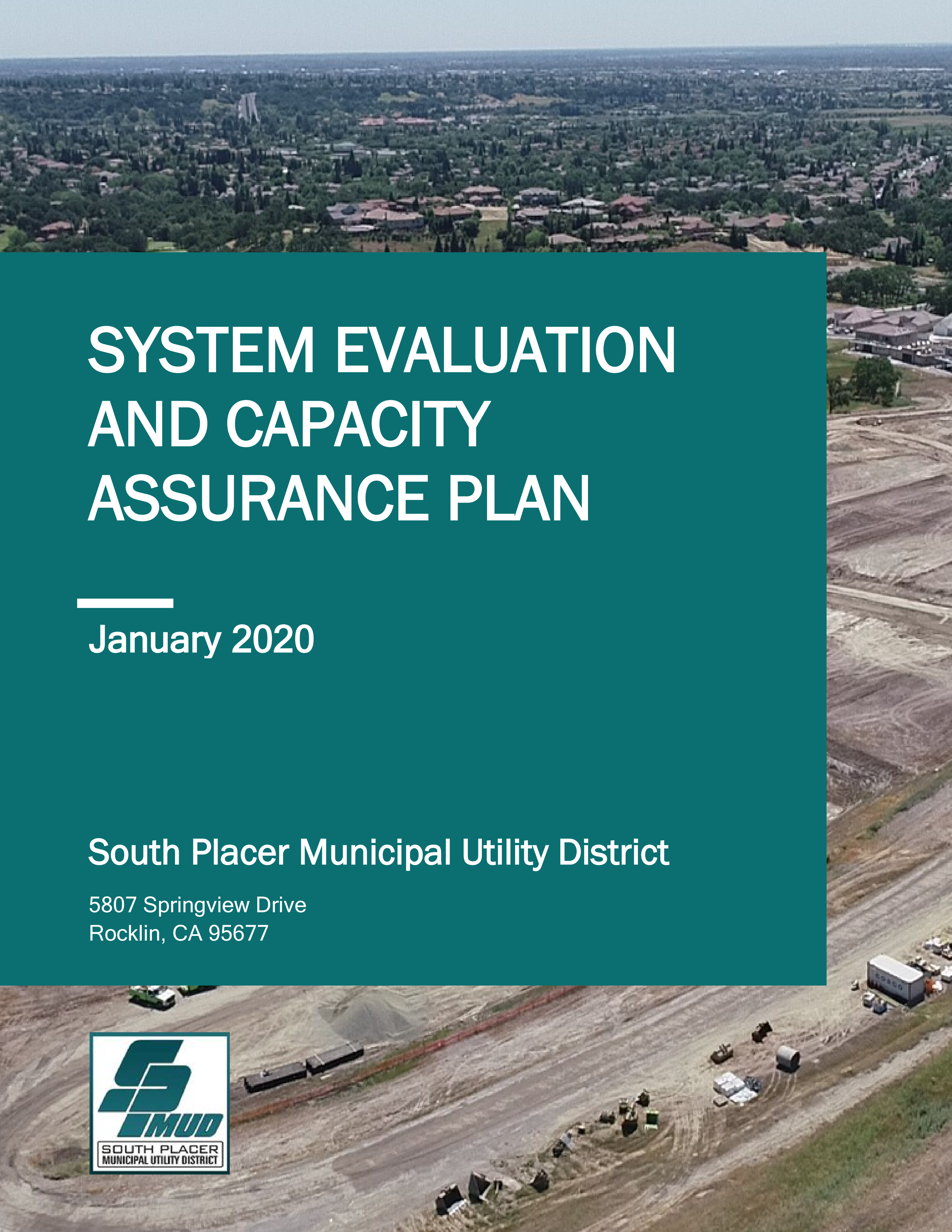

SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN

January 2020

South Placer Municipal Utility District

5807 Springview Drive
Rocklin, CA 95677

SOUTH PLACER MUNICIPAL UTILITY DISTRICT

SOUTH PLACER MUNICIPAL UTILITY DISTRICT
Wastewater Collection System
System Evaluation and Capacity Assurance Plan

Date: January 2020

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CHAPTER 1: Introduction

1.1 Purpose

The purpose of the South Placer Municipal Utility District (SPMUD or District) System Evaluation and Capacity Assurance Plan (SECAP) is to provide the District guidance in its efforts to assure capacity for existing customers, provide information on how to prepare for future development, and provide information on how to make the collection system resilient to the effects of weather conditions. This report serves as an update to the SECAP prepared for the District in 2015. The District implemented the recommendations of the 2015 SECAP to address the predicted deficiencies in capacity under the existing and near-term scenarios. This was accomplished by constructing the Loomis Diversion Line and preparing to replace the Foothill Trunk Sewer with a larger diameter pipeline. The purpose of this updated SECAP is to reassess the capacity of the District's sewer collection system after these improvements and after five years of changes in the use of the system.

The specific objectives of this System Evaluation and Capacity Assurance Plan include:

- Evaluate the capacity of the collection system under various scenarios (i.e., existing dry weather, existing wet weather, near-term wet weather, and long-term wet weather conditions) to identify potential capacity deficiencies and assign capital improvements projects to address any potential deficiencies for each scenario.
- Expand the scope of the SECAP to evaluate all collection system facilities six inches in diameter and larger.
- Estimate the costs of planned capital improvement projects that address capacity deficiencies. The estimated costs will be used in the District's Nexus Study to determine the participation fee for new connections to the sewer system.
- Comply with requirements of the California State Water Resources Control Board Order No. 2006-0003-DWQ, the Statewide General Waste Discharge Requirements for Sanitary Sewer Systems (SSS WDR) and the District's SSMP to evaluate hydraulic deficiencies, establish and implement design criteria (i.e., design storm), establish short-term and long-term capital improvement projects to address system deficiencies, and develop a schedule of completion dates for the planned capital improvements projects.

This SECAP provides the District with updated information on the existing and future hydraulic capacity of the collection system and serves as an update to the 2015 SECAP. The following chapters of this report describe the assumptions used, the process of model development, the model simulation results, and the resulting proposed capital improvement projects.

CHAPTER 2: Project Overview

2.1 Project Boundary

South Placer Municipal Utility District serves the communities of Rocklin, Loomis, Penryn, Newcastle, and portions of Granite Bay and unincorporated Placer County. The District owns, operates, and maintains a collection system, which consists of approximately 280 miles of mainline pipe (ranging from 4-inch to 54-inches in diameter), over 6000 manholes, thirteen lift stations, and ten permanent flow monitoring stations. Exhibit 1 in Appendix A shows a map of the District service area as well as the area evaluated with the hydraulic model as part of this study. This study area coincides with the study area identified in the 2015 SECAP and the District's urban growth area (UGA). The UGA is identified in the South Placer Wastewater Authority (SPWA) Wastewater Systems Evaluation Project, which evaluated the combined systems of the regional partners discharging to the two regional wastewater treatment plants.

Exhibit 1 also shows the areas that were not included in this study and thus were not evaluated with the hydraulic model. The Rodgersdale community was not included in the hydraulic model for the same reasons it was not evaluated in previous planning documents (i.e., the entire community is built out with no room for future development and according to District records, there are no existing capacity related issues). Additionally, the District's sphere of influence (SOI), which represents the full extent of the District's potential service range, was not included in the hydraulic model to remain consistent with previous hydraulic evaluations and South Placer Wastewater Authority system evaluations so that direct comparisons can be made and because the extension of the collection system into this area is very unlikely at this point, even under long-term scenarios.

2.2 Hydraulic Modeling Software

The capacity of the District wastewater collection system was analyzed using Innovyze's InfoSewer software program. InfoSewer is a powerful map-based computer program with comprehensive hydraulic computational capabilities. The District purchased the InfoSewer software and license so that future analyses could be conducted by District staff as additional data is collected and additional inquiries arise due to future development. The InfoSewer product provided extensive scenario management so that multiple scenarios (i.e., existing, near-term, long-term, dry weather, wet-weather, various improvements) can be tracked and compared, one against the other.

2.3 Flow Monitoring

The District has ten permanent flow monitors in the collection system that collect and store flow data in fifteen-minute intervals. Flow records from the years 2015 through 2018 were used in this study to evaluate changes in flow patterns and calibrate the volume of flow entering each basin within the system.

2.4 Design Storm

In addition to the permanent flow monitors described above, the District has installed and currently maintains rain gauges throughout the system. The rain gauges collect data regarding the amount of precipitation in fifteen-minute intervals on a continuous basis. Rainfall data from the entire year of 2018 was used in the study to define the rate of inflow and infiltration into the collection system from storm events.

The 10-year, 6-hour storm event was established as the design storm for the District during the development of the 2009 master plan. The same design storm was used in this study.

The design storm for the study's model simulations was developed using the EPA's Sanitary Sewer Overflow Analysis and Planning (SSOAP) Toolbox. The SSOAP Toolbox is a suite of computer software tools that allows one to utilize collected data for both sewer flows and rainfall to predict rainfall-dependent inflow and infiltration (RDI/I). RDI/I was defined by using the RTK method to generate synthetic unit hydrographs for each basin within the collection system. The unit hydrographs are used to develop the design storm hydrographs. The 10-yr, 6-hr storm event for the Rocklin area as defined by the National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 6, Version 2 data was applied to the synthetic unit hydrographs to produce the RDI/I hydrographs for each basin.

Observed storm events in 2017 provided anecdotal evidence of the benefit of using this design storm to analyze the capacity of collection system. District staff witnessed how large storm events stressed the capacity of the collections system in the portions of the system predicted by the model.

2.5 Scenario Development

One of the study's objectives was to investigate the collection system's capacity under varying conditions, and to propose potential improvements to address capacity-related deficiencies. To meet this objective, the study examined the hydraulic capacity of the system under existing conditions, after near-term development occurs, and under long-term development (ultimate build-out) conditions. The model also investigated the impact of rain events (i.e., RDI/I) by simulating each temporal variation in the model (i.e., existing, near-term, long-term) under dry weather conditions and during the design storm event described in section 2.4. Table 1 provides the naming convention of the various scenarios used in the model and a brief description of each scenario.

Table 1. Summary of Model Scenarios

Scenario	ADWF	PWWF	CIPs	Description
Existing (2020)	✔	✔	NA	Current collection system infrastructure. Current EDUs as defined in District records.
Near-Term (2025)	✔	✔	NA	Collection system after required improvements to existing system (i.e., Foothill Trunk). Addition of EDUs from near-term development as defined in city/town/community general plans.
Long-Term (2060)	✔	✔	✔	Future collection system. Addition of EDUs from long-term development as defined in city/town/community general plans for parcels within the UGA.

The existing scenario is an important first step in the capacity assessment. The amount of flow added to the model and the spatial distribution of that flow (i.e., defining how flow from all existing 23,000 connections enters the collection system) are verified and calibrated during this step. This increases the confidence in the simulated results.

The year 2025 was defined as the near-term scenario because this is the year when the District will reevaluate and update the SECAP the next time. This scenario examines the expected changes and the potential for needed improvements before the next time the system is evaluated.

The year 2060 was defined as the long-term scenario because this is consistent with previous planning documents and is a reasonable timeframe for buildout for the District. This timeframe also aligns with the assumptions and requirements of the SPWA Wastewater Systems Evaluation Project to investigate future development and buildout-sensitivity.

2.6 Capacity Analysis

For purposes of this study, capacity-deficient pipes are defined as those having less than three feet of freeboard (i.e., three feet from the hydraulic grade line to the rim elevation of the manhole). A freeboard of zero feet indicates that a discharge of sanitary sewer occurs. Once a pipe segment begins to surcharge, the addition of small amounts of flow can make dramatic changes to the level of surcharging in manholes. However, surcharging in manholes typically only occurs for short durations, during design storm events (i.e., 10-year, 6-hour rainfalls). This criterion is used so that small amounts of surcharging is allowable during the design storm scenario.

CHAPTER 3: Model Development

Model development is generally separated into two main phases. The first phase involves defining the physical attributes (i.e., pipe and manhole diameters, lengths, roughness coefficients, invert elevations, rim elevations) of the collection system. The second phase involves defining the amount and location of flows entering the system. This chapter describes the process employed to develop the model simulations used during the capacity assurance study.

Model results were obtained using extended period simulations over a three-day period. This method was selected so that the variation in flow and the impact on the system's capacity could be assessed during the design storm event and in the days that follow.

3.1 Physical Geometry

The hydraulic model represents the actual collection system with a combination of features which include pipe, manholes, wet wells, pumps, and force mains. The location and attribute information for these model features was supplied by the District's geographic information system (GIS). This information was used to create the modeled collection system to which flows would be applied to assess the system's capacity.

Previous planning efforts (i.e., the 2009 Master Plan and the 2015 SECAP) only modeled the District's trunk sewers (i.e., pipes 12 inches in diameter and larger). The District's efforts to improve its GIS system since the last SECAP allowed for this iteration of the SECAP to include all sewer mains within the system. The collection system model consists of approximately 280 miles of gravity sewer mains. All gravity sewer mains were modeled assuming a Manning's n value of 0.013.

Modeling all features within a sewer collection system requires significant amounts of data (e.g., pipe invert elevations, manhole rim elevations, pump settings). There are several immediate benefits of modeling all features within the collection system. This approach allows the District to assess every pipe within the system for information such as maximum capacity, minimum/maximum velocities, and depth to overflow. Not only does this approach provide the District additional functionality in assessing the current collection system, it also provides the District a tool to quickly and effectively assess the potential impact of future, proposed development.

Modeling the entire collection system required that a total of ten lift stations also be included in the model to appropriately characterize and convey system flows. Information about wet wells, pumps, set points, and force mains were collected from record drawings and incorporated into the model.

Proposed future pipe segments were added to the model under near-term and long-term scenarios to assess the capacity of those segments to serve future connections. Various elevation data sources were employed to investigate the topography in areas to determine if parcels could be served by the gravity pipelines added to the model. It should be noted that these assumptions were not based on survey-grade information and may require alterations during final design to account for more accurate information.

The physical geometry of the model was vetted through multiple checks. The modeling software provides tools to check the validity and integrity of the physical geometry of the modeled system. These checks were employed on the modeled system and include connectivity checks (e.g., orphan nodes, orphan links, link direction, loop finder) and network review/fix tools (e.g., trace tools, check for invalid crowns or invalid rim elevations). In addition to these tools, the modeled network was manually investigated for incorrect data using profile tools.

3.2 Hydraulic Loading

The flows modeled in this study were generated at the parcel-level and applied to the collection system. Flows were modeled in this way so that unit generation rates could be applied based on customer type, land use designations, and parcel size. This method was also selected because it provides a method for documenting assumed unit generation rates for future modeling efforts and back-checking of model simulation results. Data from various District systems of record were leveraged to accurately distribute the flow from its customers throughout the collection system. This section describes the methods used to assign flow volumes from individual units/parcels for the various scenarios.

3.2.1 Unit Flow Factors

The District applies a specific number of equivalent dwelling units (EDUs) to its customers as they connect to the collection system in accordance with the current District Sewer Code. An EDU is a unit of measure that standardizes all land use types and represents a unit of flow (gallons per day), at a certain wastewater strength, from a single-family residential unit. A business which discharges three times as much similarly characterized wastewater as an average single-detached dwelling would be assigned three EDUs. The number of EDUs for each customer was supplied by the District's customer account database (i.e., Tyler Incode) and used to calculate flows from each parcel into the collection system. To remain consistent with previous District planning efforts and the regional South Placer Wastewater Authority system evaluation efforts, 190 gpd/EDU was applied as the default unit flow factor throughout all model simulations.

Existing Development

The parcels connected to the existing collection system and the usage type of each parcel were identified using District customer account records. Three main categories for usage type were applied in the model (i.e., residential, commercial, and mixed use). Diurnal patterns were developed for each of the usage types and applied to the flows generated from each parcel.

Model results from the existing dry weather simulation were used to compare against the recorded flow monitoring data to calibrate the model. This is a crucial step to assure that the model results accurately reflect the amount of flow observed in the system. Model calibration for dry weather flows required adjustment of the unit flow factors from several sewer sheds in order to match modeled flows to the observed metered flows. The modified unit flow factors determined for this modeling effort closely matched the modified unit flow factors that were developed and used during the independent SPWA Systems Evaluation that was being conducted at the same time, which provides additional validity to the factors used. The results of the dry weather model calibration are shown in Exhibit 2. The dry weather diurnal curves for the years 2015-2018 are included where available to compare the change in flow from year to year. The influence of the various lift stations is evident in some basins by the peaks in modeled flow indicating pump cycles. The peaks of pump cycles are not seen in the diurnal curves because they are averaged out over the entire dry season. It should be noted that the Whitney Ranch area is the fastest growing area of the District. The modeled results of the Whitney Ranch basin exceed the diurnal curve flows due to this assumed growth.

Near-Term Development

Parcels that are anticipated to be developed in the near-term (i.e., by the year 2025) were identified and assigned EDUs based on information from District records about specific development projects in the entitlement process or from designated land uses. The following sources were used to determine future land uses for each parcel in the District.

- City of Rocklin Draft General Plan Update (Quad Knopf, Inc., October 2012)
- Town of Loomis General Plan (Crawford Multari & Clark Associates, July 2001)
- Placer County General Plan (Placer County, August 1994)
- Horseshoe Bar / Penryn Community Plan (August 1994)
- Granite Bay Community Plan (May 1989)

Long-Term Development

The long-term hydraulic loading of the model was completed by including all the developable parcels within the Urban Growth Area (UGA). This scenario models all parcels as contributing to the collection system and thus represents the ultimate build out of the UGA. The general plans referenced above, along with Placer County zoning information were used to determine the use and assumed hydraulic loading of long-term developments.

Many of the parcels designated as connecting to the collection system under the long-term scenario are in rural areas of the UGA. Many of the parcels currently contain residences that have individual septic systems and are located on large areas of land. Because of the lack of information about these parcels with respect to future development plans, it is difficult to definitively determine the eventual loading onto the system.

The modeled system assumed that parcels that currently contain residences or businesses will not develop (e.g., subdivide) in the future. Those residences/businesses will abandon their individual septic systems and connect to the District collection system when the District expands service into those areas. Currently vacant or undeveloped parcels were assumed to develop according to the Placer County zoning requirements regarding minimum parcel size to determine the future hydraulic loading.

The total EDUs for each scenario and its associated average dry weather flow are shown in Table 2.

Table 2. Summary of EDUs and Flows from Modeled Growth Scenarios

Scenario	Total EDUs	Additional EDUS from Previous Scenario	ADWF (mgd)	AWWF (mgd)
Existing (2020)	34,530	-	4.62	8.67
Near-Term (2025)	37,315	2,785	5.15	9.70
Long-Term (2060)	46,850	9,535	6.95	15.99

The City of Rocklin is quickly approaching buildout. Infill development will likely continue to occur, but much of the large properties within the City have been developed. Consequently, the rate of new connections to the sewer system is likely to slow as the District approaches the long-term scenario. Figure 1 shows the historic rate of growth of the District in the cumulative increase of EDUs over time. The figure also shows a projection of future EDUs based on the estimates provided in Table 2. The cumulative total of historic and estimated future EDUs shows a typical "s-curve" pattern. The rate of growth was relatively slow when the District was first established. During the 2000's the rate of growth peaked. The rate of growth has slowed some since then and it is reasonable to expect that it will continue to slow as the amount of large developable land decreases.

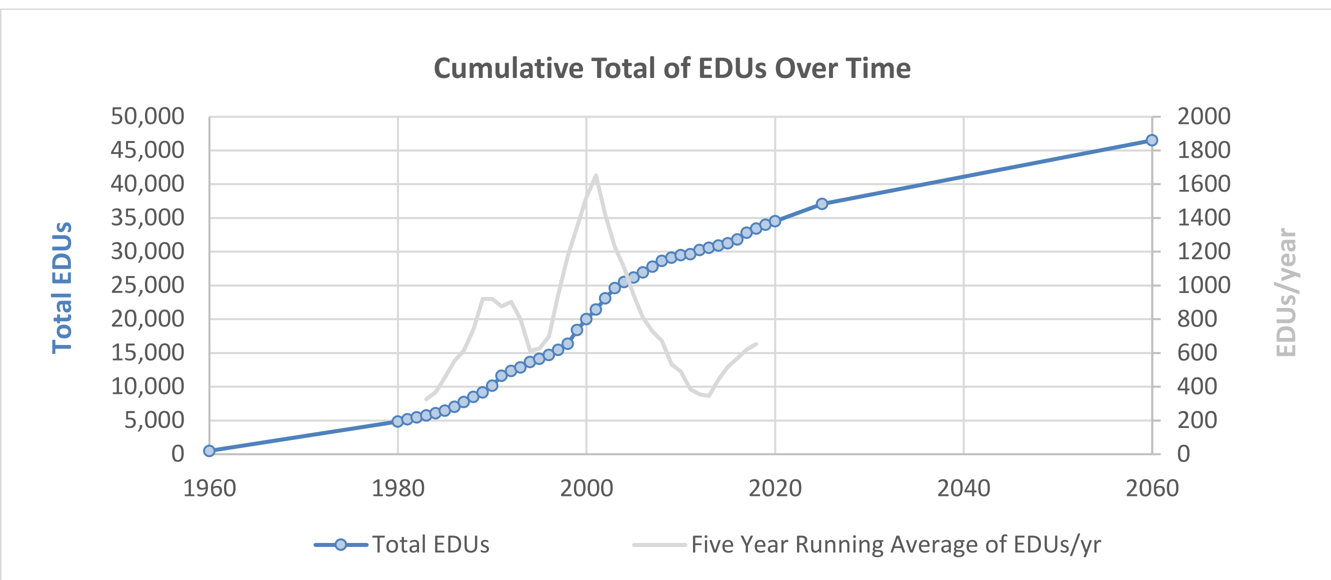


Figure 1. SPMUD Equivalent Dwelling Unit (EDU) History and Projections

3.2.2 Allocation of Generated Flows

The InfoSewer software applies loads (i.e., sewer flow) to the model using the manhole features. The hydraulic loads generated at each parcel, as described in section 3.2.1, were individually allocated to specific manholes within the system. This was accomplished by assigning a connecting manhole to each parcel within the limits of the UGA. The InfoSewer Load Allocator extension automates the process of summing the hydraulic loads from various parcels and assigning the loads to the designated manholes. Additionally, the Load Allocator extension sums each type of hydraulic load (e.g., residential, commercial) separately, so that the appropriate diurnal curve can be applied to the matching hydraulic load type.

Assigning hydraulic loads to each parcel and assigning each parcel to a manhole in the model of the system more closely represents reality with the model simulations and thus improves the reliability of the results. Additionally, this approach documents the process used to develop model simulations and allows for current and future users of the modeling software to more easily examine and retrace the assumptions made to produce the model results.

3.2.3 Rainfall Dependent Inflow/Infiltration

Rainfall dependent inflow and infiltration (RDI/I) is the increased portion of water flow in a sanitary sewer system that occurs during and after a rainfall event. RDI/I can represent a significant portion of the collection system's capacity to convey wastewater. This section describes the process used during this study to quantify the amount of RDI/I entering the District's collection system, and the method used to represent the level of RDI/I in the model simulations.

The data collected by the District's flow monitoring stations and rain gauge station were used to quantify the amount of RDI/I entering the system from each sewer basin. The quantity and timing of RDI/I entering the collection system in response to the design storm was developed using the EPA's Sanitary Sewer Overflow Analysis and Planning (SSOAP) Toolbox. Utilizing this method allowed the model to more accurately represent the response of each basin to the design storm based on observed data. The basin-specific RDI/I was spatially distributed to the modeled system using a gallon per linear foot approach.

Because historic flow monitoring data can do little to predict the response of future collection system components (e.g., pipes, manholes), a general RDI/I value was applied to future portions of the collection system modeled in the near-term and long-term scenarios. A value of 600 gpd/ac was applied to the hydraulic load from parcels connecting to the system under these future scenarios. This value is representative of the RDI/I values observed in the newer portions of the District's existing collection system after the SSOAP Toolbox analysis. Certain portions of the existing system exhibited lower values of RDI/I than 600 gpd/ac entering the system, but this number was selected as a conservative, yet realistic number to represent RDI/I entering the system from new development.

CHAPTER 4: Capacity Analysis Results

4.1 Existing Capacity

Under existing dry weather conditions, the model simulation showed that the pipes in the collection system, with a few exceptions, flow less than 50% full during the period of peak flow. Pipe segments along the Foothill Trunk exceed 50% full during peak flow. These pipes have limited hydraulic capacity due to the shallow pipe slopes along this trunk sewer. No sanitary sewer overflows occur under the existing dry weather scenario. Exhibit 3 in Appendix A shows the results of the capacity assurance analysis under existing dry weather conditions.

Under existing wet weather conditions, the model simulation showed no sanitary sewer overflows (SSOs). However, it also showed surcharging in the Foothill Trunk and in the Bankhead Trunk along Humphrey Road. The model simulation also showed brief surcharging in a couple of pipe segments of the Antelope Creek Trunk and other portions of the Bankhead Trunk. These are areas known to the District as potential capacity restrictions and are monitored with automated level sensors and portable flow recorders. The Foothill Trunk is currently under contract to be replaced with larger diameter pipes. The other trunk sewers mentioned above are scheduled to be replaced with larger diameter pipes in the long-term scenario. The schedule for replacement will be expedited if monitoring data indicates a trend toward a potential SSO.

Exhibit 4 in Appendix A shows the results of the capacity assurance analysis under existing wet weather conditions. The figure also shows the simulated peak flows through every pipe segment of the collection system.

4.2 Near-Term Capacity

Under near-term wet weather conditions, the model simulation showed no sanitary sewer overflows (SSOs). The modeled system assumes that the Foothill Trunk Sewer Replacement project is complete. The same trunk sewers that surcharge under existing wet weather conditions, surcharge under the near-term wet weather conditions. Because the surcharging is brief in nature and these trunk sewers are closely monitored, the schedule for constructing larger diameter replacement sewers is outside of the next five-year period. Should development occur differently than assumed for this analysis and generate additional sewer flow, these trunk sewers may require replacement sooner than anticipated.

Exhibit 5 in Appendix A shows the results of the capacity assurance analysis under near-term wet weather conditions and identifies the capacity deficiencies described above.

4.3 Long-Term Capacity

Under the long-term wet weather scenario, the model simulation showed the trunk sewers in the Antelope Creek and Secret Ravine basins are overwhelmed and multiple SSOs occurred in the model (see Exhibit 6 in Appendix A). These basins have a significant amount of additional area within the UGA that connects to the collection system under the long-term conditions. The trunk sewers in these basins are some of the oldest in the District and were not originally designed to convey ultimate build out flows. Conversely, the model simulation showed that the Pleasant Grove basin (i.e., west Rocklin) has no pipe segments with capacity deficiencies.

Exhibit 7 in Appendix A shows the results of the capacity assurance analysis under the long-term wet weather conditions and identifies the capacity deficiencies described above. The figure also shows the proposed alignments of future trunk lines needed to collect and convey ultimate build out flows. The numbers shown on the figure correspond with the ID identified for each proposed capital improvement project in the tables below.

CHAPTER 5: Capital Improvement Projects

5.1 Completed Projects

Several capital improvement projects identified in previous plans were completed and should be documented in this update of the SECAP.

The Upper Antelope Creek East trunk sewer in Swetzer Road was completed in 2013 and allowed for the abandonment of the Munoz Lift Station. The sewer flows from the western portion of Penryn now flow by gravity through the Bankhead Trunk.

The Lower Loomis Diversion projects (i.e., the 15-inch and 18-inch diameter trunk sewer) that connect the 10-inch trunk in Loomis on the northwest side of Interstate 80 with the Sierra College Lift Station were completed in January of 2019. This project provided the ability to divert flow from the 10-inch Lower Loomis Trunk, lessening the likelihood of an SSO from the 10-inch Lower Loomis Trunk during rain events.

The Foothill Trunk Sewer Replacement project was designed and permitted during the last five years. It is currently under contract to be constructed. Since the construction of that facility is not complete, it remains as a project within this SECAP.

5.2 Project Cost Assumptions

An important step of the SECAP process is to determine the cost of needed future improvements. District Resolution 18-22 established a schedule of values to be used for the valuation of sewer system assets. The schedule of values includes a baseline construction cost for open cut construction and options for trenchless construction methods. The schedule of values also includes additional costs for items such as extraordinary dewatering, hard rock conditions, productivity factors, and surface restoration. Project costs were developed for each proposed capital improvement project using this schedule of values.

Many of the capital improvement projects identified in the District's SECAPs assume the replacement of an existing facility to provide the needed additional capacity. The District manages different funds for different activities. One fund (i.e., Fund 300) is used for the extension or expansion of sewer facilities for new users. Another fund (i.e., Fund 400) is used to depreciate assets and pay for the eventual replacement and/or rehabilitation of assets when they reach the end of their useful service life. A new method for appropriately assigning the costs of SECAP projects was developed for this SECAP to align with the designated functions of these two funds.

When replacing an existing trunk sewer, a portion of the cost can reasonably be funded with depreciation that was collected for the purpose of replacing assets that no longer provide the expected level of service (e.g., age out). When replacing an existing trunk sewer with a larger diameter pipe, the cost for a portion of that project can reasonably be funded with participation fees (e.g., connection fees) collected in response to the connection's impact on available capacity. The District uses a method based on the ratio between the existing and the proposed cross-sectional areas of the trunk sewer to apportion the costs of the project. This method was selected because the cross-sectional area of a pipeline is related to the capacity of the pipeline to convey sewer.

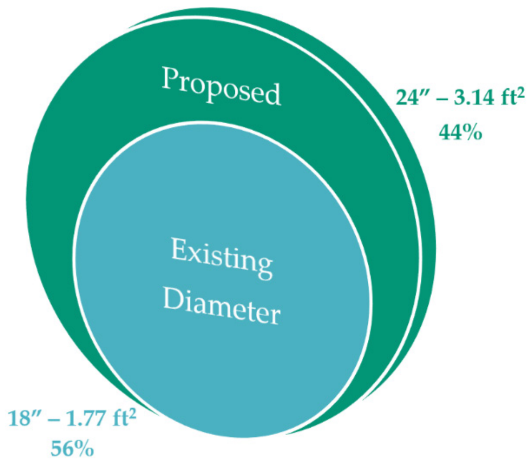


Figure 2. Ratio of Cross-Sectional Areas

For example, an 18-inch diameter pipeline has a cross-sectional area of 1.77 ft^2. If it were to be replaced with a 24-inch diameter pipeline (which has a cross-sectional area of 3.14 ft^2), the existing cross-sectional area of the 18-inch pipe represents 56% of the proposed cross-sectional area of the 24-inch pipe. In this example, 56% of the project cost would be paid for "replacing" (i.e., Fund 400) the pipeline and 44% of the project cost would be paid for "enlarging" (i.e., Fund 300) the pipeline. This method for apportioning the cost is used when determining the cost of projects below.

Additionally, a 30% contingency was applied to the construction costs and an additional 10% was used to account for the engineering design and administration costs. These values were the same percentages used to quantify costs in previous planning efforts.

5.3 Existing CIPs

The cost estimates for the projects needed to address the existing wet weather capacity deficiencies (see section 4.1) are described below in Table 3.

Table 3. Summary of Existing System Improvements

ID	Sewer Trunk	Existing Diameter(s)	Proposed Diameter(s)	Length (LF)	SECAP Cost ($)	R&R Cost ($)	Total Cost ($)
1	Foothill	12"	24"	2275	2,861,250	953,750	3,815,000
-	Atherton Trunk	20"	24"	800	NA	NA	NA
				Total Costs	**2,861,250**	**953,750**	**3,815,000**

The Foothill Trunk Sewer Replacement Project corrects a restriction in capacity within the District's system that has existed for some time. The project will replace a section of 12-inch diameter pipeline situated between a section of 15-inch diameter and 24-inch diameter pipelines. The lack of sufficient capacity in this portion of the system is due partly to the smaller diameter pipe segments and the fact that many of the pipe segments of this trunk were constructed with minimum slopes. Design for this construction project began in October 2014.

Challenges with permitting delayed construction. Permits were issued in late 2019 and the project was advertised for bids. A contractor is currently under contract to complete the Foothill Trunk Sewer Replacement Project by the end of 2020.

The Atherton Trunk Sewer Replacement Project is included in Table 3 for reference. The costs for this project are not included in this analysis because this project will be completed by the City of Rocklin. In accordance with City of Rocklin Resolution 2014-15 “Resolution of the City Council of the City of Rocklin Approving and Authorizing the City Manager to Execute an Agreement with South Placer Municipal Utility District for the Funding and Construction of the Atherton Sewer Trunk Upgrade Project” the City adopted a development impact fee to fund this improvement. Per the agreement, the City is responsible to construct this replacement project when a specified number of EDUs connect to the system upstream. The City has begun design of this project and intends to construct it in 2020. The modeled system assumed the proposed diameter of 24 inches for all simulations.

5.4 Mitigation CIPs

Previous capacity planning efforts included mitigation projects to correct identified capacity deficiencies within the collection system. The Loomis Diversion Project was previously identified as a mitigation project that would divert flow away from the Lower Loomis Trunk Sewer which was at risk of releasing sewer during design storm conditions. The Loomis Diversion Project was completed and accepted by the District in January 2019.

No new mitigation projects are proposed as part of the 2020 SECAP.

5.5 Near-Term CIPs

The improvement projects listed in Table 5 address the near-term wet weather capacity deficiencies described in section 4.2.

Table 4. Summary of Near-Term System Improvements

ID	Sewer Trunk	Existing Diameter	Proposed Diameter	Length (LF)	SECAP Cost ($)	R&R Cost ($)	Total Cost ($)
2	Boyington Diversion	-	12”	3,240	1,390,293	-	1,390,293
				Total Costs	**1,390,293**	**-**	**1,390,293**

The Boyington Diversion Trunk extends from the upstream end of the Loomis Diversion to Boyington Road. The trunk sewer will allow from the abandonment of two sewer lift stations (i.e., Boyington Lift Station and Silver Ranch Lift Station). This trunk sewer is expected to be located in a proposed frontage road along Interstate 80. This trunk sewer will likely be constructed with the development of the property on which it will be located. However, if needed, the District may elect to construct this facility prior to development of the property to realize the benefit of abandoning two lift stations.

5.6 Long-Term CIPs

The results of the model simulation of the long-term scenario indicate the need for significant improvements to the collection system. Table 6 contains the list of proposed improvements to provide capacity for long-term development. The names of the projects have been revised from previous SECAP documents to better represent the project location. This includes removing references to businesses no longer in operation and using creeks and street names where possible. The ID in the table below corresponds to the number for each project shown in Exhibit 7 in Appendix A. Exhibit 7 shows the extent of the required improvements to address deficiencies identified during the model simulation of the long-term scenario and the result those improvements have on the capacity of the system after they have been implemented.

Table 5. Summary of Long-Term System Improvements

ID	Sewer Trunk	Existing Diameter	Proposed Diameter	Length (LF)	SECAP Cost ($)	R&R Cost ($)	Total Cost ($)
3	Springview Drive	24"	30"	1,170	320,432	569,656	890,008
4	SPMUD Corp Yard	30"	36"	930	89,603	115,204	763,556
5	Woodside	27"	36"	1,150	1,359,111	1,747,428	204,807
6	Lower Secret Ravine A	27"	36"	2,750	709,985	567,988	3,106,539
7	Lower Secret Ravine B	24"	36"	1,260	1,533,569	2,726,344	1,277,974
8	Lower Secret Ravine C	24"	30"	4,680	753,375	602,700	4,259,913
9	Lower Secret Ravine D	18"	27"	1,530	506,247	1,401,915	1,356,075
10	Schriber / Black Willow	18"	21"	7,950	811,647	1,844,653	1,908,162
11	Sucker Ravine B	15"	18"	4,800	1,396,757	2,483,123	2,656,301
12	Bankhead A	12"	15"	8,290	453,224	180,164	3,879,880
13	Bankhead B	8"	15"	1,290	1,619,546	1,295,637	633,388
14	Upper Antelope Creek East A	8"	12"	7,220	89,603	115,204	2,915,182
15	Aguilar Creek B	10"	12"	5,300	1,160,944	2,638,509	3,799,452
16	Antelope Creek A	18"	27"	3,120	3,043,333	2,434,667	5,478,000
17	Antelope Creek B	18"	24"	3,730	1,375,418	1,768,395	3,143,813
18	Antelope Creek C	10"	15"	3,260	1,052,818	842,254	1,895,072
19	Clover Valley	8"	15"	6,250	3,047,101	1,211,270	4,258,371
				Total Costs	**19,466,418**	**22,960,153**	**42,426,571**

5.7 New Sewer Trunks

Table 7 lists the proposed new sewer trunks that will need to be constructed to convey flow from future development. The alignments, sizes, and lengths of new sewer trunks were originally obtained from the District's 2009 and 1986 master plans and updated with this SECAP to reflect current plans.

Table 6. Summary of New Trunk Sewers

ID	Sewer Trunk	Proposed Diameter	Length (LF)	SECAP Cost ($)	R&R Cost ($)	Total Cost ($)
20	Sierra College Trunk	24''	6,660	4,795,200	-	4,795,200
21	Cameo Trunk	15''	2,600	1,170,000	-	1,170,000
22	Upper Clover Valley A	10''	6,000	1,800,000	-	1,800,000
23	Upper Antelope Creek	15''	13,700	6,165,000	-	6,165,000
24	Upper Antelope Creek West	8''	7,700	1,848,000	-	1,848,000
25	Upper Antelope Creek Middle A	10''	5,370	1,611,000	-	1,611,000
26	Upper Antelope Creek Middle B	8''	7,600	1,824,000	-	1,824,000
27	Loomis East	8''	11,600	2,784,000	-	2,784,000
28	Brace Road Pump Station		EA	3,000,000	-	3,000,000
29	Brace Road East	12''	7,840	2,822,400	-	2,822,400
30	Horseshoe Bar Road East	10''	9,210	2,763,000	-	2,763,000
			Total Costs	**30,582,600**	**-**	**30,582,600**

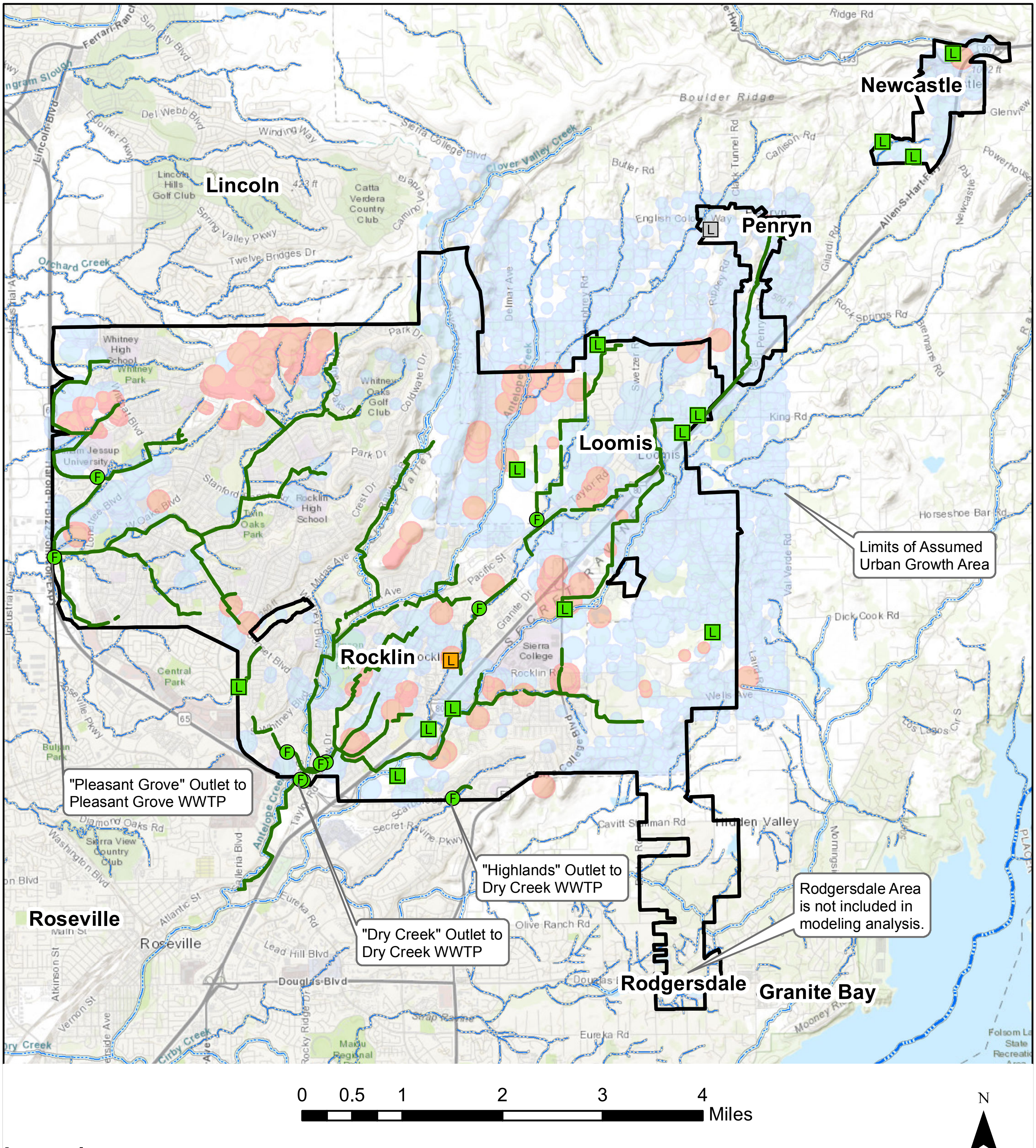
Two of the proposed new trunk sewer projects are new to the District's planning documents. Although these projects are documented for the first time in this SECAP, they have been contemplated by District staff for many years and discussed with the potentially affected property owners for many years as well. These projects are the Sierra College Trunk and the Cameo Trunk.

The Sierra College Trunk is a new pipeline that would run through the Sierra College property from the Sierra College Lift Station at Sierra College Boulevard and Schriber Way to the intersection of Rocklin Road and Aguilar. This trunk sewer would better serve Sierra College, allowing the college to abandon multiple private pump systems. This trunk sewer would also allow the District to abandon the District-owned Sierra College Lift Station and convey all flow that currently enters the lift station by gravity.

The Cameo Trunk Sewer is a new pipeline that would run from the District-owned Cameo Court Lift Station to the City of Roseville trunk sewer system on the west side of Stanford Ranch Road. The project would include the construction of on-site storage to provide attenuation of peak flow during storm events and the replacement of approximately 2,700 feet of existing City of Roseville sewer with 15-inch diameter pipe. Capacity in the City of Roseville system has been preliminarily investigated and, at the time, there was capacity in the downstream system. These results will need to be verified and further coordination will be required with the City of Roseville for this project to move forward.

CHAPTER 6: Appendix A

- Exhibit 1 –South Placer Municipal Utility District Service Area
- Exhibit 2 – Summary of Average Dry Weather Diurnal Curves against Modeled Results
- Exhibit 3 – Existing ADWF
- Exhibit 4 – Existing PWWF (10-year, 6-hour Design Storm)
- Exhibit 5 – Near-Term PWWF (10-year, 6-hour Design Storm)
- Exhibit 6 – Long Term PWWF (10-year, 6-hour Design Storm)
- Exhibit 7 – Long Term PWWF with Proposed Improvements



Legend

- Lift Station
- Flow Recorder
- Stream
- Trunk Sewer
- Near-Term Connections
- Long-Term Connections
- District Boundary

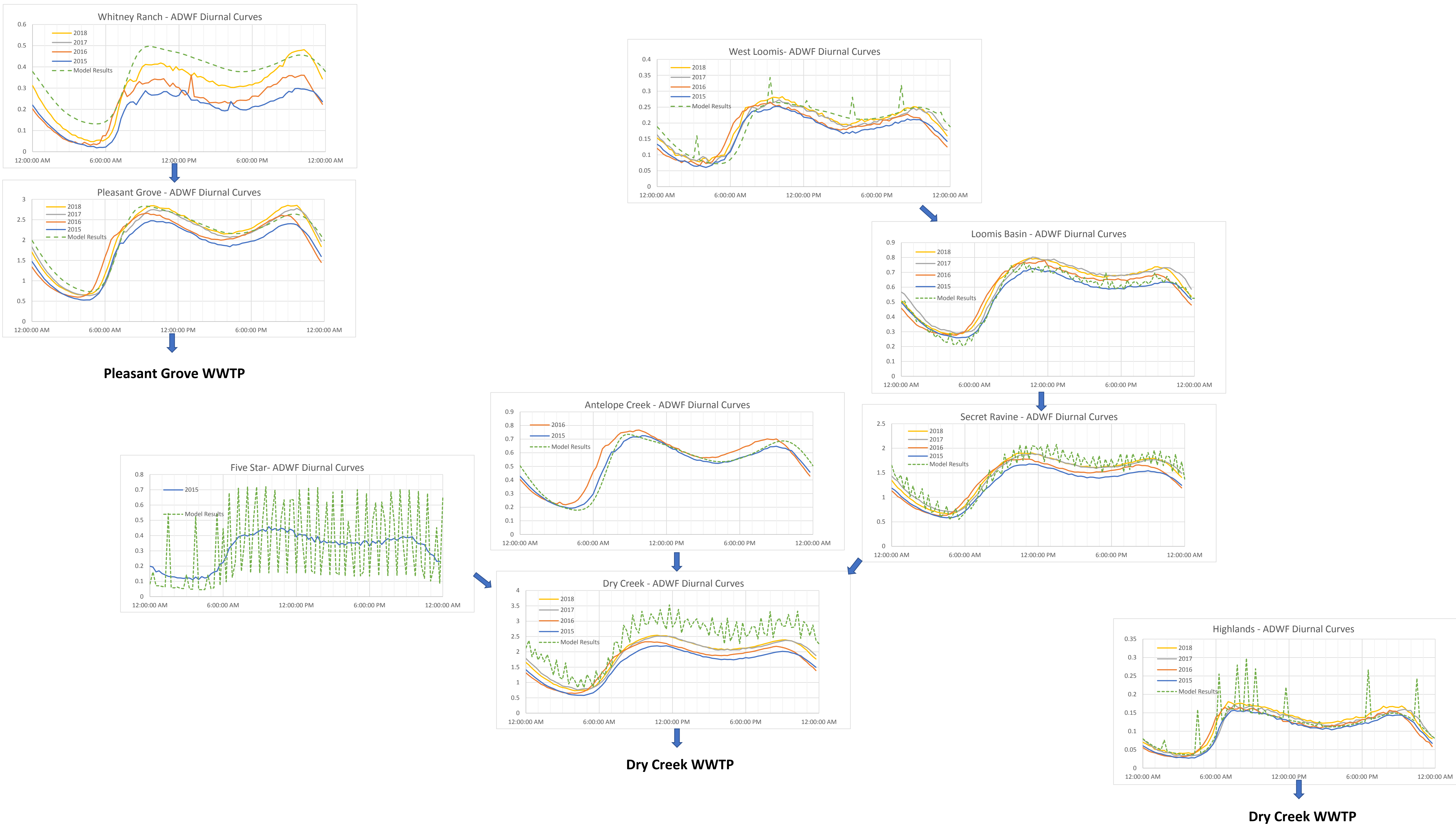
South Placer Municipal Utility District
2020 System Evaluation and Capacity Assurance Plan

SPMUD
Service Area

EXHIBIT 1

EXHIBIT 2

Summary of Average Dry Weather Diurnal Curves against Modeled Results

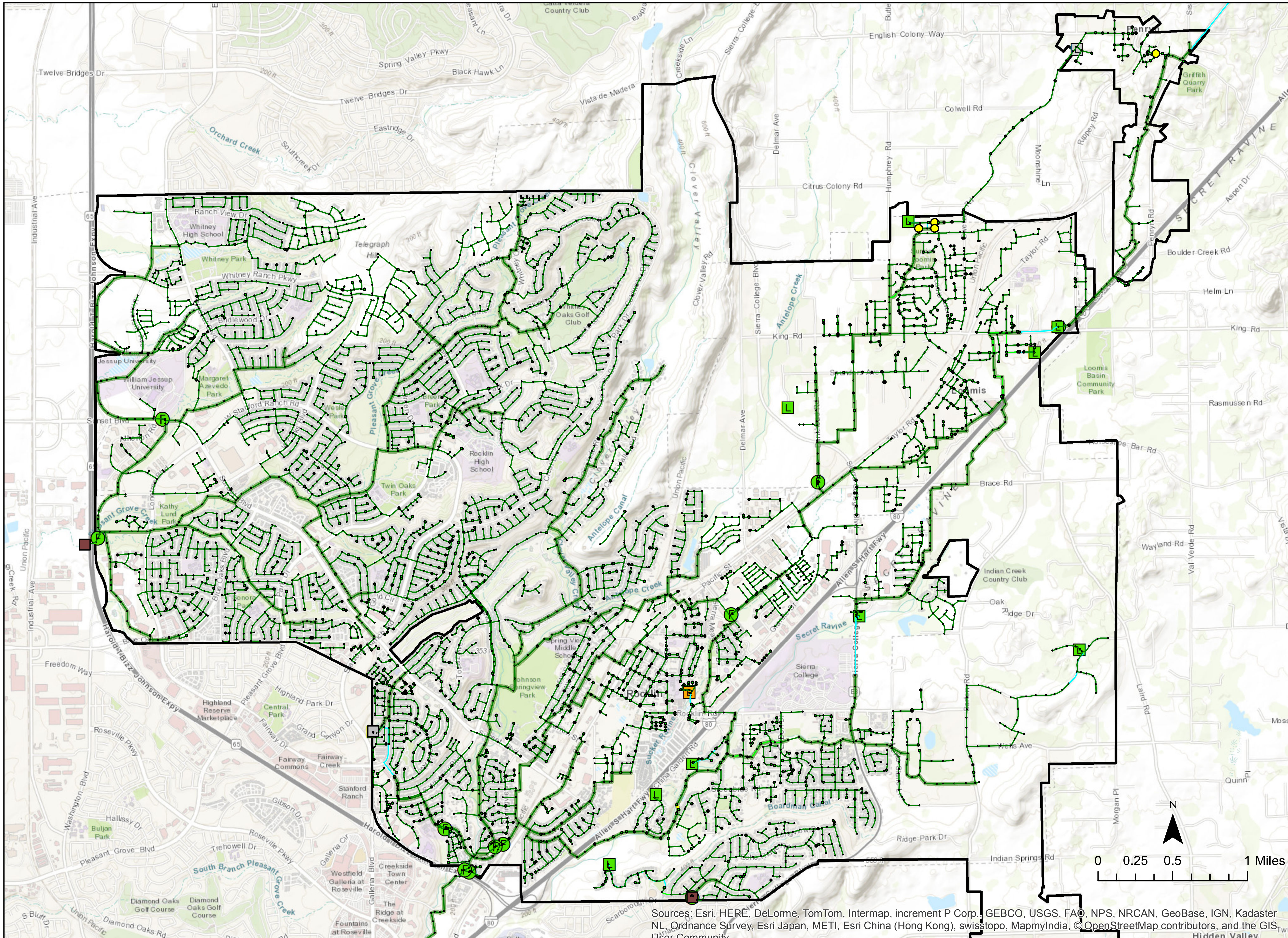


Notes: Flow rates are all in units of MGD.

EXHIBIT 3

South Placer Municipal Utility District
2020 System Evaluation and Capacity Assurance Plan

Existing ADWF



SOUTH PLACER MUNICIPAL UTILITY DISTRICT

Legend

Manhole

Freeboard (ft)

- Less than 0
- 0~1
- 1~3
- 3~6
- Greater than 6

Gravity Main

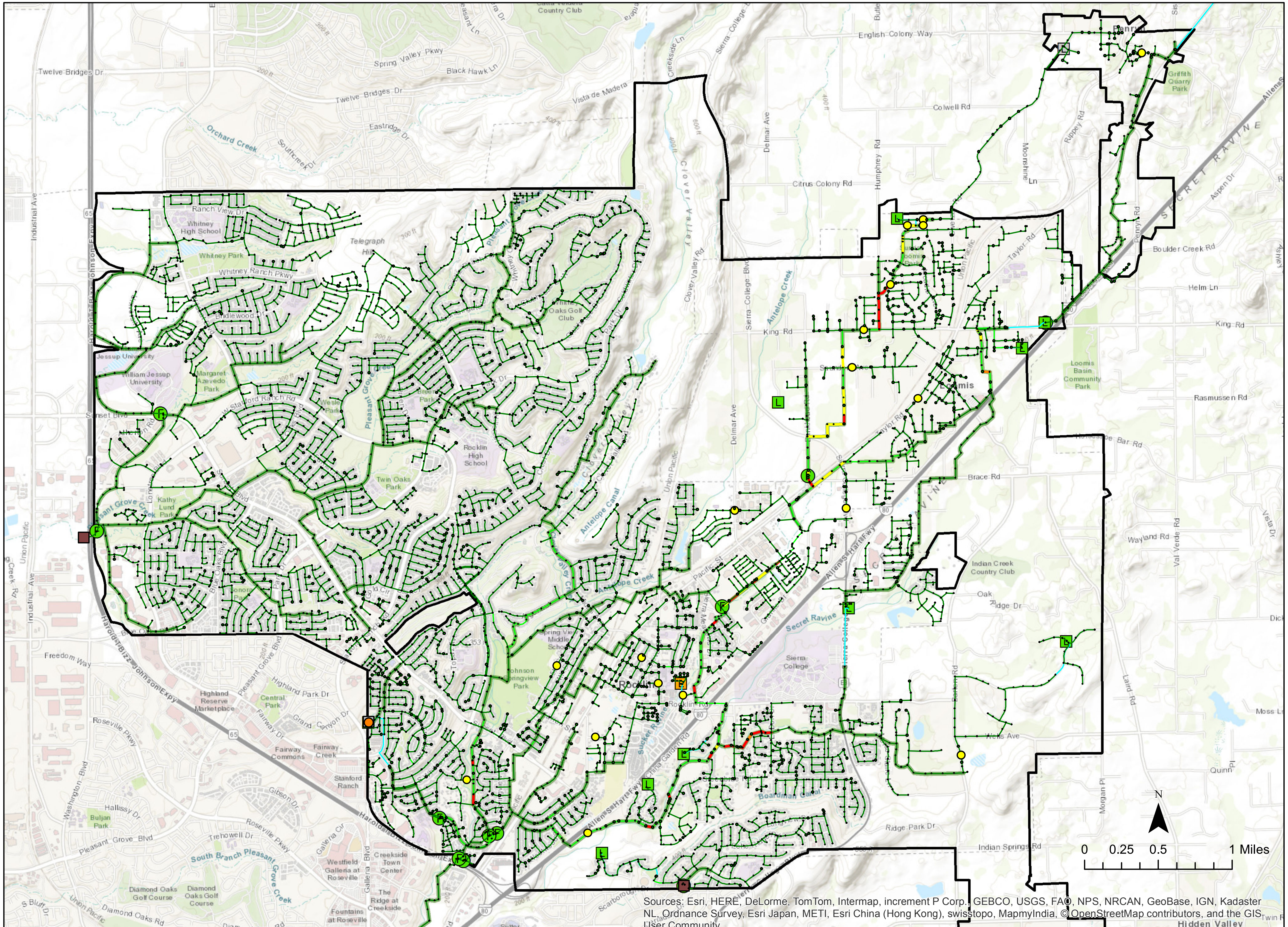
Maximum d/D

- Less than 0.5
- 0.5~0.7
- 0.7~0.8
- 0.8~0.99
- Greater than 0.99

EXHIBIT 4

South Placer Municipal Utility District
2020 System Evaluation and Capacity Assurance Plan

Existing PWWF



Legend

Manhole Freeboard (ft)

- Less than 0
- 0~1
- 1~3
- 3~6
- Greater than 6

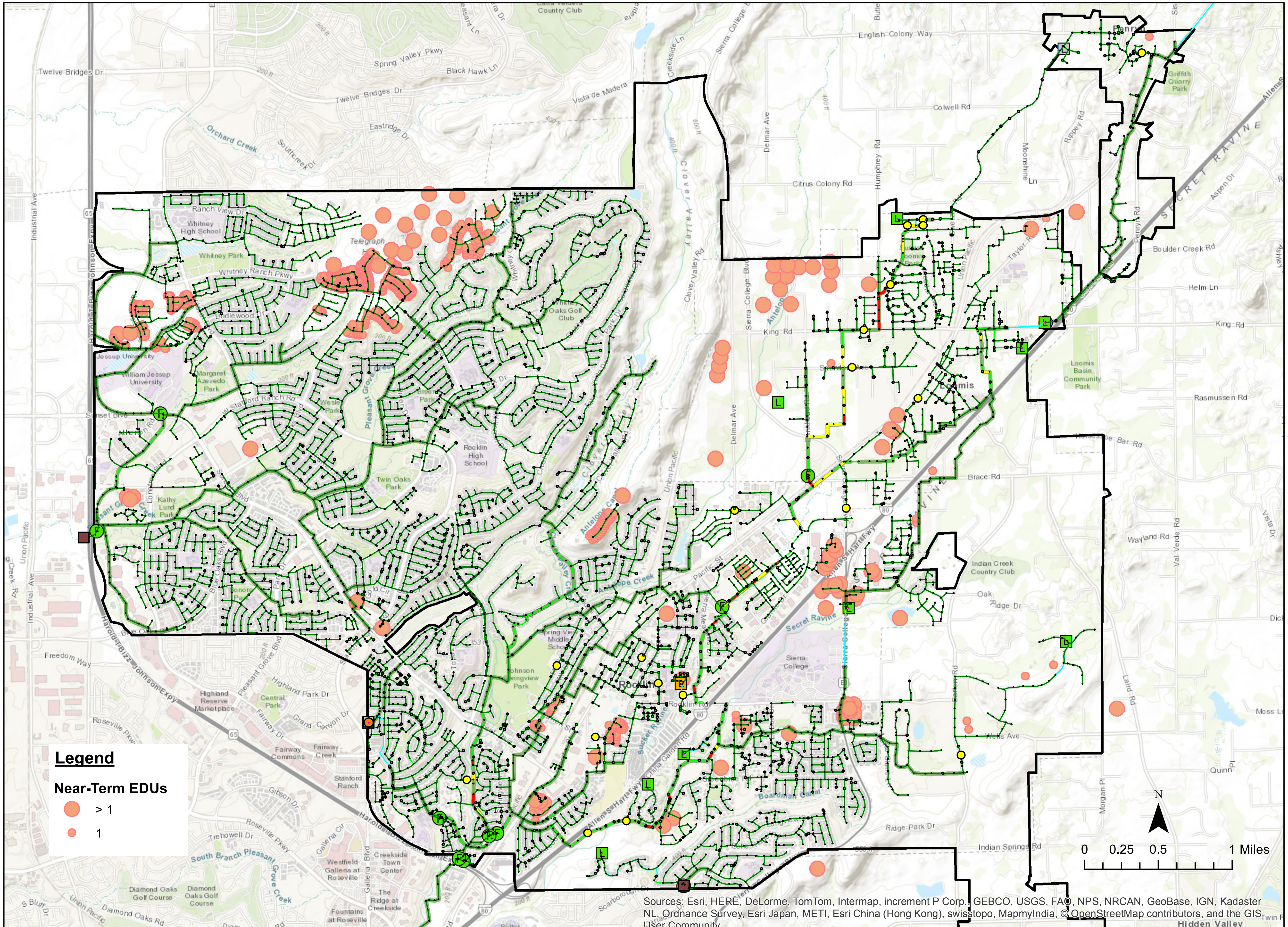
Gravity Main Maximum d/D

- Less than 0.5
- 0.5~0.7
- 0.7~0.8
- 0.8~0.99
- Greater than 0.99

EXHIBIT 5

South Placer Municipal Utility District
2020 System Evaluation and Capacity Assurance Plan

Near-Term PWWF



SOUTH PLACER MUNICIPAL UTILITY DISTRICT

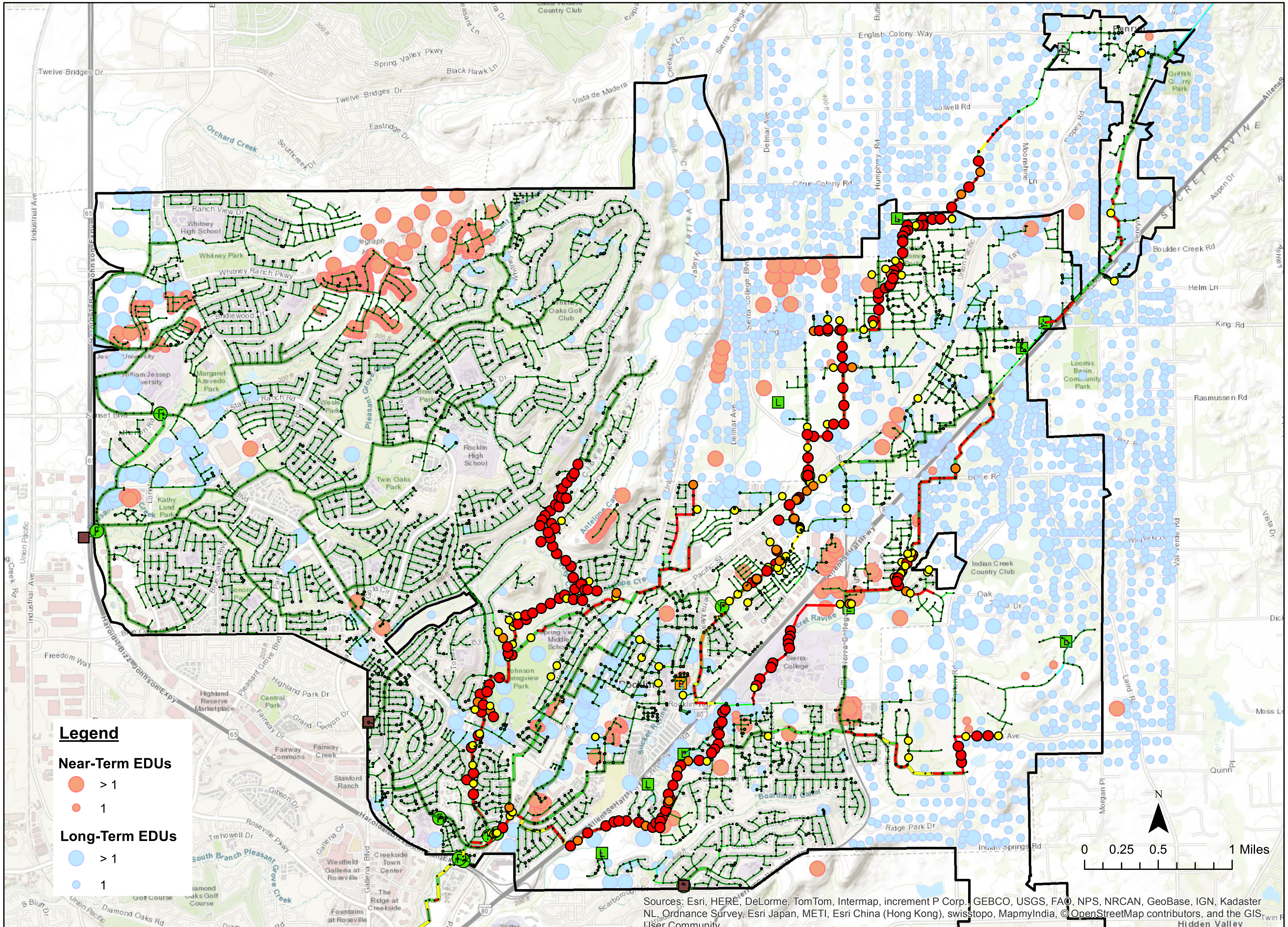
Legend

Manhole Freeboard (ft)

- Less than 0
- 0~1
- 1~3
- 3~6
- Greater than 6

Gravity Main Maximum d/D

- Less than 0.5
- 0.5~0.7
- 0.7~0.8
- 0.8~0.99
- Greater than 0.99



SOUTH PLACER MUNICIPAL UTILITY DISTRICT

EXHIBIT 6

South Placer Municipal Utility District
2020 System Evaluation and Capacity Assurance Plan

Long-Term PWWF

Legend

Manhole Freeboard (ft)

- Less than 0
- 0~1
- 1~3
- 3~6
- Greater than 6

Gravity Main Maximum d/D

- Less than 0.5
- 0.5~0.7
- 0.7~0.8
- 0.8~0.99
- Greater than 0.99

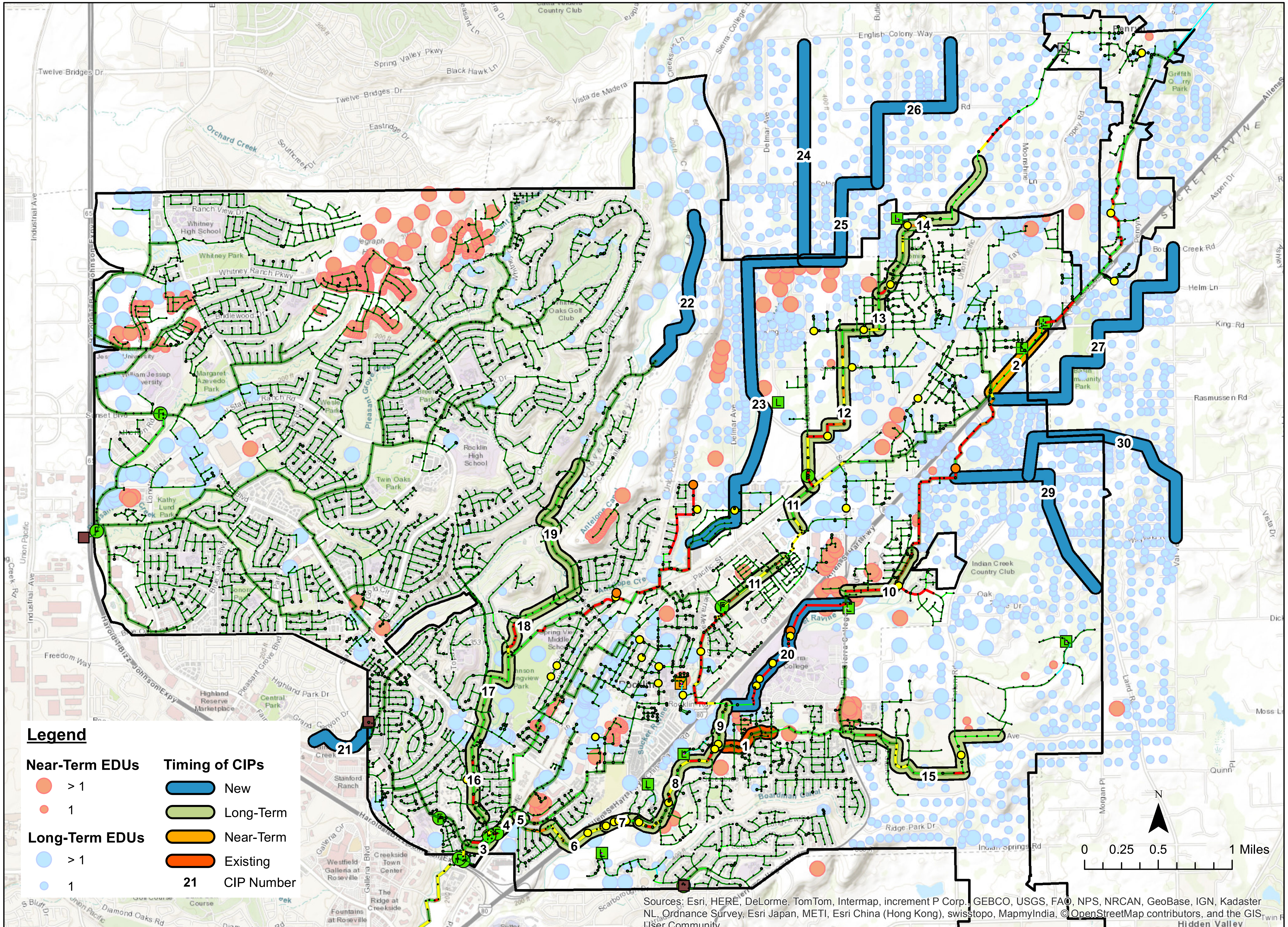
EXHIBIT 7

SOUTH PLACER MUNICIPAL UTILITY DISTRICT

South Placer Municipal Utility District
2020 System Evaluation and Capacity Assurance Plan

Long-Term PWWF

with Proposed Improvements



Legend

Manhole Freeboard (ft)

- Less than 0
- 0~1
- 1~3
- 3~6
- Greater than 6

Gravity Main Maximum d/D

- Less than 0.5
- 0.5~0.7
- 0.7~0.8
- 0.8~0.99
- Greater than 0.99