VALLEY CENTER MUNICIPAL WATER DISTRICT

WATER MASTER PLAN

June 2020 Update
of the
January 2019 Water Master Plan

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WATER MASTER PLAN

EXECUTIVE SUMMARY

Valley Center Municipal Water District now has facilities that provide capacity far in excess of that currently being used. This excess capacity was the result of outside factors beyond the District's control: 1) increases in wholesale water cost which affected the extent of agriculture in the District and significantly reduced water sales and 2) water conservation. Due to these factors, the basis of the Capital Improvement Program (CIP) development process has changed from the earlier 2002 Water Master Plan. The need to add capacity is not present, while at the same time the need to maintain existing aging infrastructure is heightened. To address the current situation, the 2019 Master Plan had redirected its focus from identifying future expansion projects to repairing and replacing existing assets. This 2020 update to the 2019 Master Plan reevaluates the priority of the individual project facility replacement recommendations

The types of projects included in the CIP represent significant construction of facilities. These projects differ from operations and maintenance projects in both magnitude of cost and intent. CIP projects are normally characterized as being an upgrade to or replacement of existing infrastructure: e.g., replacing 1,000 ft. of pipe, recoating a reservoir, or replacement of the main pumps and motors at a booster station. O&M expenses generally represent more minor replacement/upgrade projects: e.g., replacement of an air release valve, replacement of pump bearings, or repair of a portion of site fencing.

Depreciation is being used by the District as one measure of requirements for infrastructure investments to sustain existing capacity. Ideally, One way for the District to maintain reliable infrastructure, is to identify some percentage of depreciation to invest in either construction or replacement reserves. Over the past 4 years, the total annual depreciation of all water assets at the District has ranged from approximately $6.8 M to $10.5 M. The largest portion of this is related to pipelines whose depreciation has ranged from approximately $5.1 M to $7.8 M. The asset management data supporting the depreciation calculations are constantly being refined and developed to both: 1) account for new assets and 2) identify and categorize existing assets in a more relevant fashion.

Capital Improvement Plan (CIP)

The proposed CIP is presented for ranges of 1 to 5 years, 6 to 10 years, and 11 to 20 years. The projects are currently divided into major asset class categories representing: Pipelines, Reservoirs, and Pump Stations. Prioritization criteria for the different classes vary, but generally projects are prioritized based on combination of asset condition, and significance to District water deliveries/operations. Safety is always a key concern of the District and any asset posing a threat to the safety of either District staff or the public moves to the top of the list to be addressed. The certainty of the actual projects to be constructed diminishes as the date of construction moves further into the future, such that the projects in the 0 to 5 year range have the highest certainty of being constructed.

Below is a table presenting a summary of the costs for proposed projects over the next 20 years. The first 5 columns represent costs for projects over the next 5 years, with the following two columns presenting costs from 6 to 10, 11 to 20 years from now, respectively. The third column represents the total funding needed for all projects proposed in the next 20 years, an annual average of $4.55M.

Proposed SRF funding brings the proposed direct funding in line with the totals represented in the District's November 2019 Long Range Financial Strategy.

Summary of CIP Projects

(YEARS)	1	2	3	4	5	1-5	6-10	11-20	TOTALS
PIPELINES	$2,075,000	$7,230,000	$7,195,000	$5,170,000	$3,950,000	$25,620,000	$26,560,000	$26,534,000	**$78,714,000**
RESERVOIRS	$2,970,000	$1,769,000	$1,318,000	$1,171,000	$1,409,780	$8,637,780	$1,664,250	$1,610,898	**$11,912,928**
PUMP STATIONS	$0	$0	$450,000	$0	$0	$450,000	$0	$0	**$450,000**
GRAND TOTALS	**$5,045,000**	**$8,999,000**	**$8,963,000**	**$6,341,000**	**$5,359,780**	**$34,707,780**	**$28,224,250**	**$28,144,898**	**$91,076,928**
SRF TOTALS	**$200,000**	**$5,255,000**	**$4,395,000**	**$5,170,000**	**$3,950,000**	**$18,970,000**	**$26,560,000**	**$10,383,000**	**$55,913,000**
DIRECT TOTALS	**$4,845,000**	**$3,744,000**	**$4,568,000**	**$1,171,000**	**$1,409,780**	**$15,737,780**	**$1,664,250**	**$17,761,898**	**$35,163,928**

Overviews of project locations are presented in the pipeline, reservoir and pump station maps located in Appendix A. Further details, including figures of the 0 to 5 year pipeline projects, are presented in the various sections of this master plan update.

Pipelines

The pipeline projects represent replacements of existing pipelines that are of concern due to observed advanced deterioration, breakage rates, and/or material of construction. The rate of average annual spending for pipelines over the next 5 years is approximately $3.0 M. Over the past 4 years, pipeline depreciation has ranged from approximately $5.1 M to $7.8 M and an amount representing approximately 40% of the annual deprecation is allocated toward funding the replacement of pipeline facilities.

Reservoirs

Steel reservoirs require recoating approximately every 15 years in order to maintain their viability. Considering information currently available, it appears that an annual investment of approximately $1.5 million is required simply to maintain reservoir coating condition. Prior to the drought the District was maintaining this sustainable reservoir coating cycle. However, due to financial constraints brought on by the drought, reservoir coatings were deferred in favor of more urgent projects. Deferring the coating projects will likely result in the need to replace an unknown number of rafters and earthquake straps and an additional 10% contingency is recommended to account for these expenses. As a result, an annual investment of approximately $1.7 M is recommended to maintain the reservoirs, which is consistent with the range of depreciation on reservoir assets from $0.8 M to $1.4 M seen over the last 4 years. Because of the painting and recoating have been deferred, an annual outlay greater than $1.7 may be required to catch up on the reservoir painting and recoating projects.

Pump Stations

The pump station assets have recently completed their major full-station rebuilds, so no significant sustained construction is expected over the next 20 years. Over the next 5 years projects include one small pump station replacement project, along with regular maintenance and repairs not categorized as CIP projects. Depreciation associated with pump station assets has recently ranged from $0.9 M to $1.3 M per year.

Miscellaneous

Assets included under this category include PRV stations and large scale SCADA/Controls/Monitoring Systems. The PRV stations have all been recently upgraded and no significant expenditures are expected over the next 20 plus years.

SCADA/Controls/Monitoring Systems require continual upgrading to remain current with technology. However, no CIP spending is anticipated on these systems over the next 10 years.

Funding Strategy

The District considers two means of funding for Capital Improvement projects, utilizing direct capital funds and leveraged funds through available financing programs. The State Revolving Fund (SRF) program sponsored by the State Water Resources Control Board (SWRCB) is the financing mechanism that the District will pursue for certain projects. The advantage of funding projects in this manner allows the District to retain a strong cash position and spread the debt service charge on the loaned amount over a period of time, usually 20 years. The SRF program is state and federally funded, available to only public agencies through a rigorous application process, and has the benefit of low interest rates, usually 1-2% depending on the economic climate. The process requires approval of an in depth loan application with specific criteria met for projects to qualify. The main premise for qualification surrounds projects that address failing or aging infrastructure, such as the District's pipeline replacement program. The reservoir coating and pump station projects are viewed as maintenance by the SWRCB, therefore they do not qualify for this Program. Staff has done extensive research and strategizing in selecting projects that would be most appropriate for this program and have identified the projects that will be pursued with SRF funding represented in Table P-1. Below is a summary table showing the split between Direct and Leveraged Totals for the pipeline projects. The proposed annual project schedule in Table P-1 is contingent upon SRF approval for the respective projects. In the event project(s) are denied SRF funding, the District will re-assess their timing pending availability of another form of funding.

PIPELINE PROJECTS FUNDING SUMMARY									
(YEARS)	**1**	**2**	**3**	**4**	**5**	**1-5**	**6-10**	**11-20**	**TOTALS**
SRF	$200,000	$5,255,000	$4,395,000	$5,170,000	$3,950,000	$18,970,000	$26,560,000	$10,383,000	**$55,913,000**
DIRECT	$1,875,000	$1,975,000	$2,800,000	$0	$0	$6,650,000	$0	$16,151,000	**$22,801,000**
TOTALS	**$2,075,000**	**$7,230,000**	**$7,195,000**	**$5,170,000**	**$3,950,000**	**$25,620,000**	**$26,560,000**	**$26,534,000**	**$78,714,000**

SRF Application Strategy and Phasing

A typical application may take six to twelve months to be processed through the SWRCB once submitted. Certain time consuming deliverables are required to be included in order for the application to be eligible for submittal. For instance, the process requires environmental reviews following California Environmental Quality Act (CEQA) regulations as well as project specifications and plans to be completed with the submittal. Depending on the type of project, circumstances, and current status those alone could take up to six months to complete. If multiple projects are submitted in one application, all must be completed as specified; failure to utilize allocated funds for the projects submitted may disqualify the entire reimbursement.

Considering those conditions and others, staff has determined the following strategy for selection of projects and phasing of application submittals, as reflected in Table P-1.

- One application will be submitted each year for 2-3 projects, within the year of submittal, time is allocated for completing necessary items and the application itself, and time for review/approval once submitted.
- Once application is approved, the construction phase will commence, for planning purposes, it is shown to take place within the following fiscal year, but could be sooner depending on when the application is approved by the SWRCB. Meanwhile the cycle restarts with a new application for the next set of projects. Note, the expenditures represented within are not intended to coincide with the District's yearly fiscal budget, rather for cash flow and resource planning purposes.
- Project selection criteria for each application cycle will focus on the highest priority, most defined and vetted at the time to minimize the chance of a major scope change or delay after approval that could affect eligibility of the funds.
- A significant portion of the application is constant and will not have to be reproduced for each subsequent submittal, except for the project specific information.

Staff has vetted this approach with officials at the SWRCB administering the program and gained confidence that this strategy will yield the best chances for approvals and streamlined process. The proposed "SRF Funded" project schedule in Table P-1 is contingent upon successful approvals by the SWRCB, if projects are denied or determined to be ineligible, staff will evaluate and propose a different strategy for their execution at that time.

Asset Management Program

District staff developed an asset management program consisting of a Master Plan outlining the priority of replacement projects and a Long Range Financial Strategy outlining the funding requirements and availability. There are distinct advantages to having such a program including enhanced reliability of facilities and a reduction in long range costs.

One of the foundations for this program is the database of assets. This data base represents a description of all District assets, most of which can be associated with one of four general asset categories: pipelines, reservoirs, pump stations, and miscellaneous. Information from this database is used in preparing/estimating the Replacement Cost New (RCN) for facilities.

A condition assessment of the District's assets, whether formal or informal, provides the District with information that can be used in assessing the remaining useful lives of facilities. The useful lives are used in calculating asset depreciation, which is a measure of asset deterioration over time.

Depreciation is subtracted from RCN to develop the Replacement Cost New Less Depreciation (RCNLD) of that asset. This RCNLD is the considered the current value of the asset and the basis of the "buy-in" capacity charge and annexation fees for new customers to the District's water system. Thus, the asset management program provides a tangible, transparent mechanism for developing rates and fees that are tied directly to the assets themselves. In developing the approach creating fees and charges, the District has strived to be fair to both existing and new customers.

Another function of the Asset Management Program is to facilitate development of a replacement plan to fund assets. The District's Water Master Plan and the Long Range Financial Strategy, proactively determines funding availability for major projects that need to occur, how much those projects will cost,

and when the project and funding will be needed. This planning will allow the District to minimize the long term cost of capital and construction costs to the District by: identifying windows of time in which projects can be executed which allows taking advantage of low interest rate funding opportunities when they arise; creating replacement reserve accounts that will serve as collateral to lower bond rates when selling bonds is an attractive option, and minimizing reactive emergency repair projects which are constructed at a premium and disrupt District staff in the execution of planned duties.

SECTION I. INTRODUCTION

Overview of District

The District imports nearly 100 percent of its domestic water from the San Diego County Water Authority. The District is also the largest retail purchaser of agricultural water within SDCWA's service area. As of May 22, 2020, the District serves 10,210 active water meters, including 7,505 domestic meters, 1,220 residential fire protection meters, 1,119 certified agricultural meters and 366 commercial meters.

The Service Area boundary of the District is presented in Figure 1. This figure includes the most recently annexed areas to the northwest, as well as the locations of the First and Second San Diego Aqueducts.

SECTION II. WATER DISTRIBUTION INFRASTRUCTURE

General

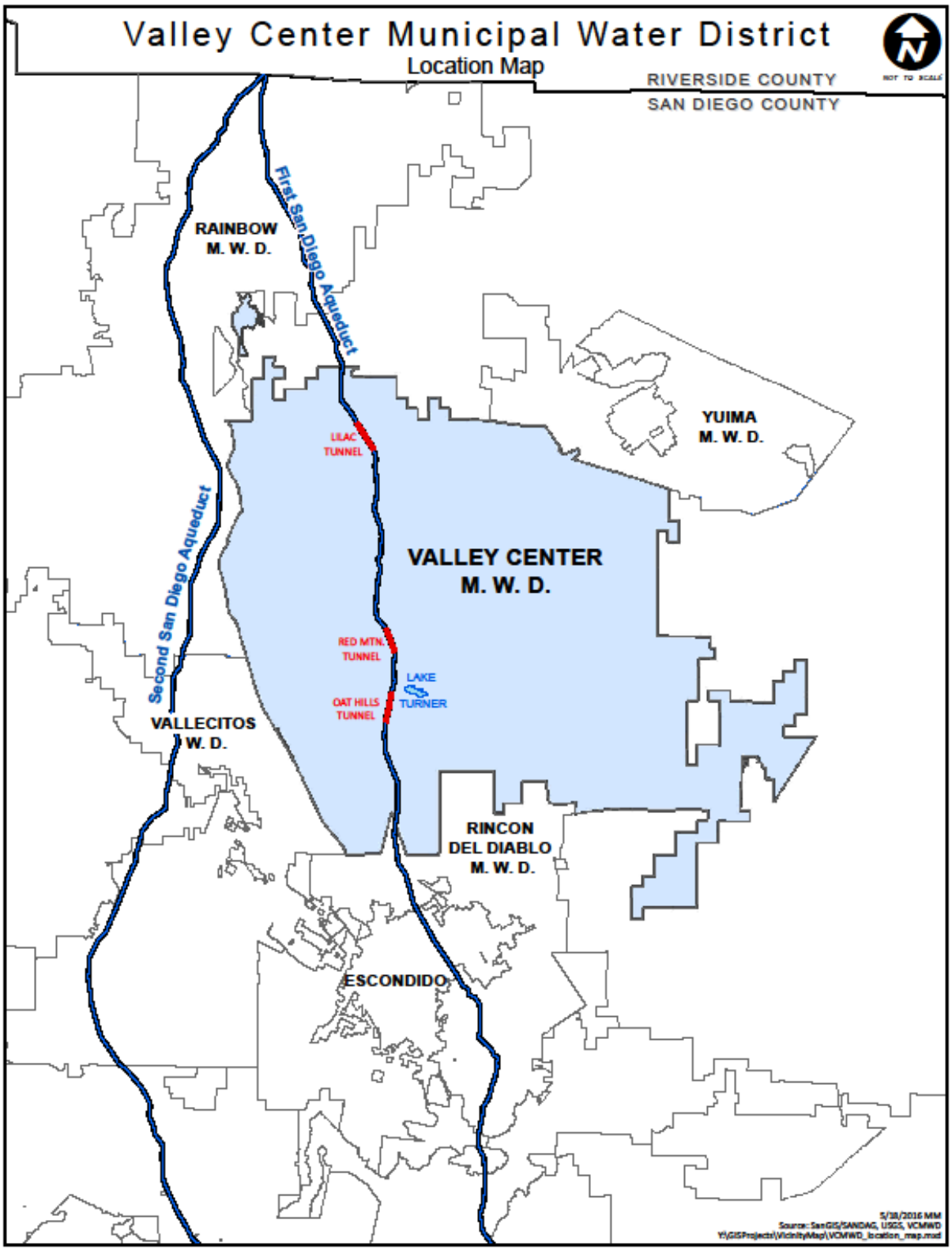
Water distribution assets have been assigned 4 major categories: 1) Pipelines, 2) Reservoirs, 3) Pump Stations, and 4) Miscellaneous. The purpose of this master plan update is to determine the priority of the repair and replacement projects needed to maintain the system and, per the water model, what upgrades are necessary to improve service.

Depreciation

Total depreciation on all water distribution assets; pipelines, reservoirs, and pump stations over the last 4 years has varied between 6.8 M to $10.5 M. In order to maintain the assets into the future and remain a going concern, the District needs to continue to be involved in a combination of efforts including:

- Constructing replacement facilities,
- Investing in maintenance activities that will prolong assets' useful lives, and
- Planning funding strategies to replace assets at the end of their service life.

Service Area Boundary



Pipelines

Overview

A pipeline replacement program has been undertaken by the District to respond to aging infrastructure and an increase in pipe breaks. In 2008, a tar-wrapped steel pipeline burst in Cole Grade Road shutting down the road temporarily and requiring emergency repair. After much investigation, it was determined that roots grew in between the tar wrapper and the steel pipe causing the wrapper to peel off and expose bare steel which subsequently deteriorated. A check of other aging wrapped steel installations has confirmed the potential for the wrapper to peel off, so the District has identified its aging tar-wrapped coated steel pipes and created a program to systematically replace them.

There was a similar occurrence in Valley Center Road with a longitudinally welded (as opposed to spiral welded) steel pipe which burst and shut down traffic temporarily. The longitudinal weld ripped open along the length of the pipe.

Prioritization of Projects

Pipe break history is a key factor in the prioritization of pipeline projects. Any observed physical pipeline deterioration is also a key factor and weighed depending on the significance of the deterioration. Pipe material and age are also key considerations, with the oldest tar-wrapped steel pipelines having the highest priority. These pipelines merit the highest ranking because they have historically presented the most significant failure issues to the District.

Construction Approach

Historically, the District has solely utilized the conventional construction method for their pipeline CIP work, such as open cutting a trench, installing new pipe and re-connecting services/appurtenances, and backfilling. The widespread and rural nature of the District's service area requires pipelines to be installed in remote alignments, such as steep hills, ravines, creeks, and other hard to access areas. Many of those pipelines were installed in the era when tar wrapping was predominantly used, in addition to its age, past leak history, and likelihood for failure have prioritized them for replacement. As a result, the cost for replacement using conventional methods skyrockets, coupled with environmental restrictions, making these projects difficult to accomplish.

Recently, the District has successfully piloted newly established trenchless pipeline rehabilitation technologies that focus on lining or sleeving the existing pipe. The trenchless approach can be accomplished at a significantly lower cost, and avoid triggering certain environmental impacts, allowing these projects be more feasible. The end result is similar in terms of extending useful life and eliminating the effect from corrosion in tar wrapped pipe, among other benefits. There are various technologies available, and each has its own nuances and circumstances where they are most appropriate. Staff has become educated in the various processes and has identified projects in Table P-1 that are well suited to be executed using some type of the trenchless approach. Due to the specialized nature of the technology, there are certain inconsistencies with the requirements of the SRF process that do not allow these projects to be eligible for funding, therefore, they have been categorized as direct funded. The SRF program is constantly evolving; as this technology becomes more main stream, it may become eligible in the future, and staff will adjust accordingly.

Project Description

Table P-1 presents the proposed pipeline projects for the next 20 years. The first 5 columns represent the costs for projects over the next 5 years, with the following two columns representing costs for 6 to

10 years, and 11 to 20 years, respectively. Project identifiers (e.g. WS015) are tied to the pipeline map presented in Appendix A. The project descriptions and corresponding maps are focused on the near term 0-5 year projects as they are most defined at this time. The projects currently listed in the 0 to 5 year section have been specifically targeted because of an urgency tied to their pipe break history, field observed poor condition, and/or pipe age and material. A description accompanied by a schematic of the project will be presented, along with a breakdown of budget level project costs.

SRF Funded Projects

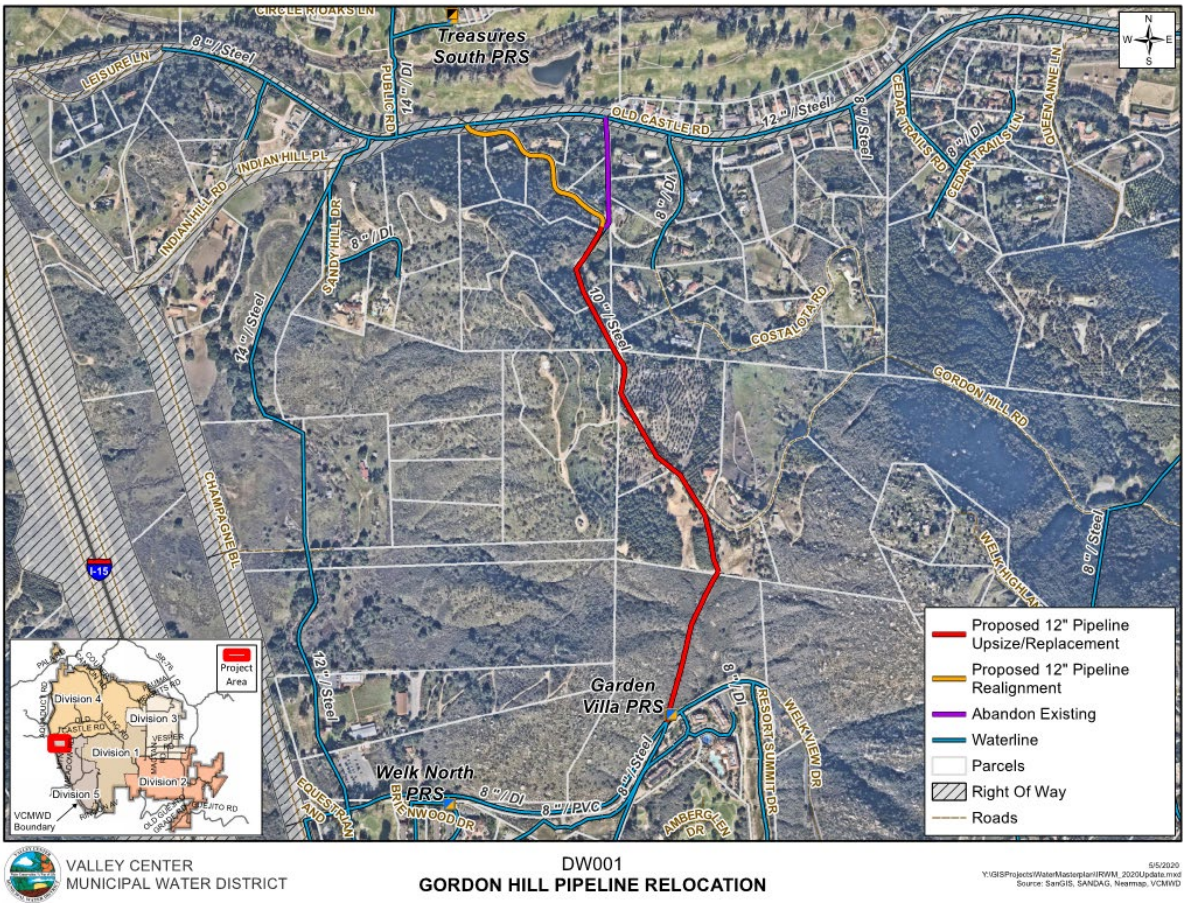
DW001– Gordon Hill Pipeline Relocation

Description – The pipeline, originally installed in 1962, has reached the end of its useful life as evidenced by numerous repairs that have been necessary. The Gordon Hill Pipeline Relocation Project includes the replacement and relocation of approximately 4,700 LF of 12-inch pipe within Gordon Hill Road, between Old Castle Road and Welk View Drive.

A portion of pipe located within fenced back yards will be abandoned and a new waterline constructed within the improved Gordon Hill Road. This is a high-pressure pipeline located within private property. Pipe failure will likely result in significant damage to private assets. Steep terrain and private improvements make it difficult to access and maintain this facility in its current location.

Due to high pressures in the area and ease of installation, C900 PVC CL305 pipe will be used.
Approximate Cost - $1,300,000.

Gordon Hill Pipeline Relocation

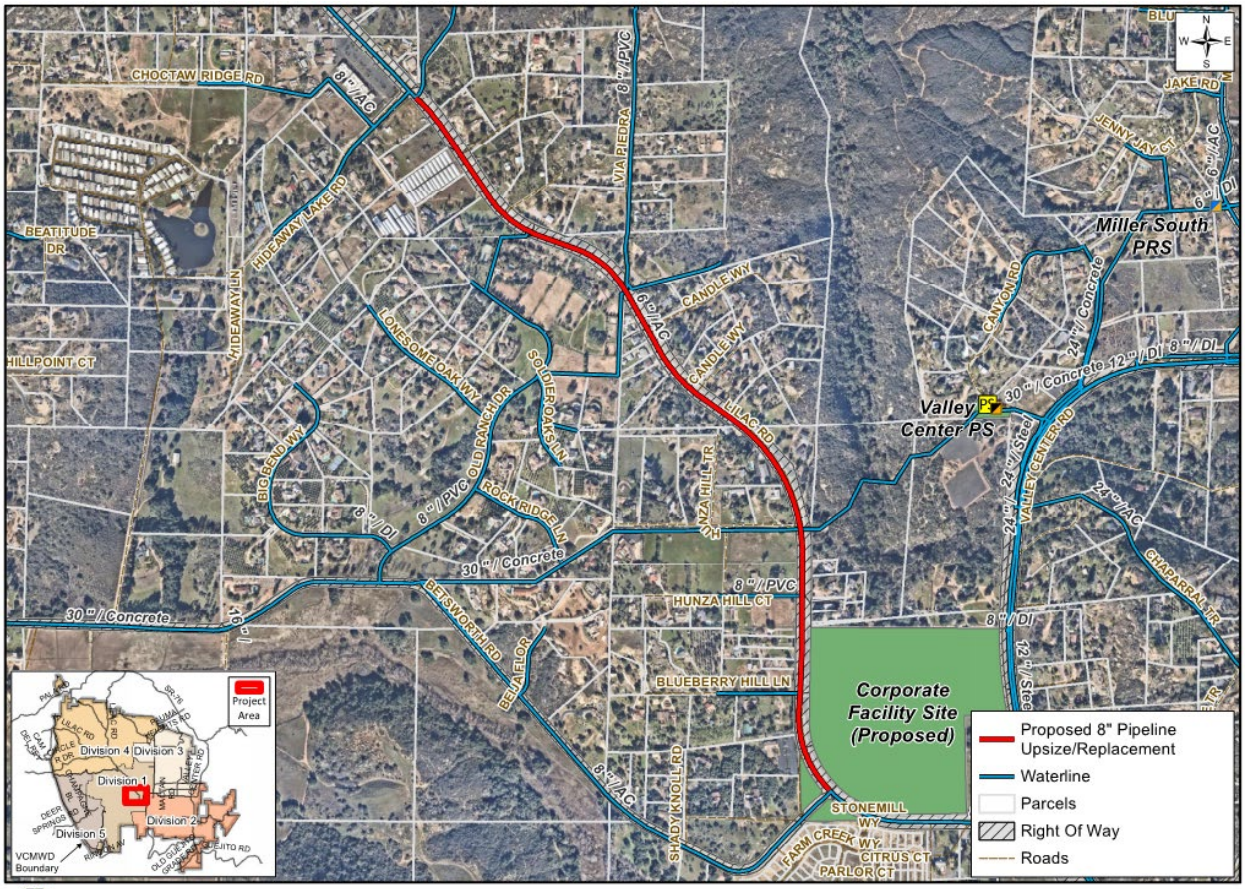


CV050 – Lilac Road Pipeline Upsize

Description – The project consists of removal of approximately 6,000 LF of 6-inch Asbestos Concrete waterline and replacement with 8-inch PVC waterline and required appurtenances on Lilac Road between Hideaway Lake Rd and Betsworth Road. This project will increase flows and pressures within the area which are subject to fluctuations when using the Valley Center Pump Station.

Approximate Cost - $3,000,000.

Lilac Road Pipeline Upsize



VALLEY CENTER MUNICIPAL WATER DISTRICT

CV050
LILAC ROAD PIPELINE UPSIZE

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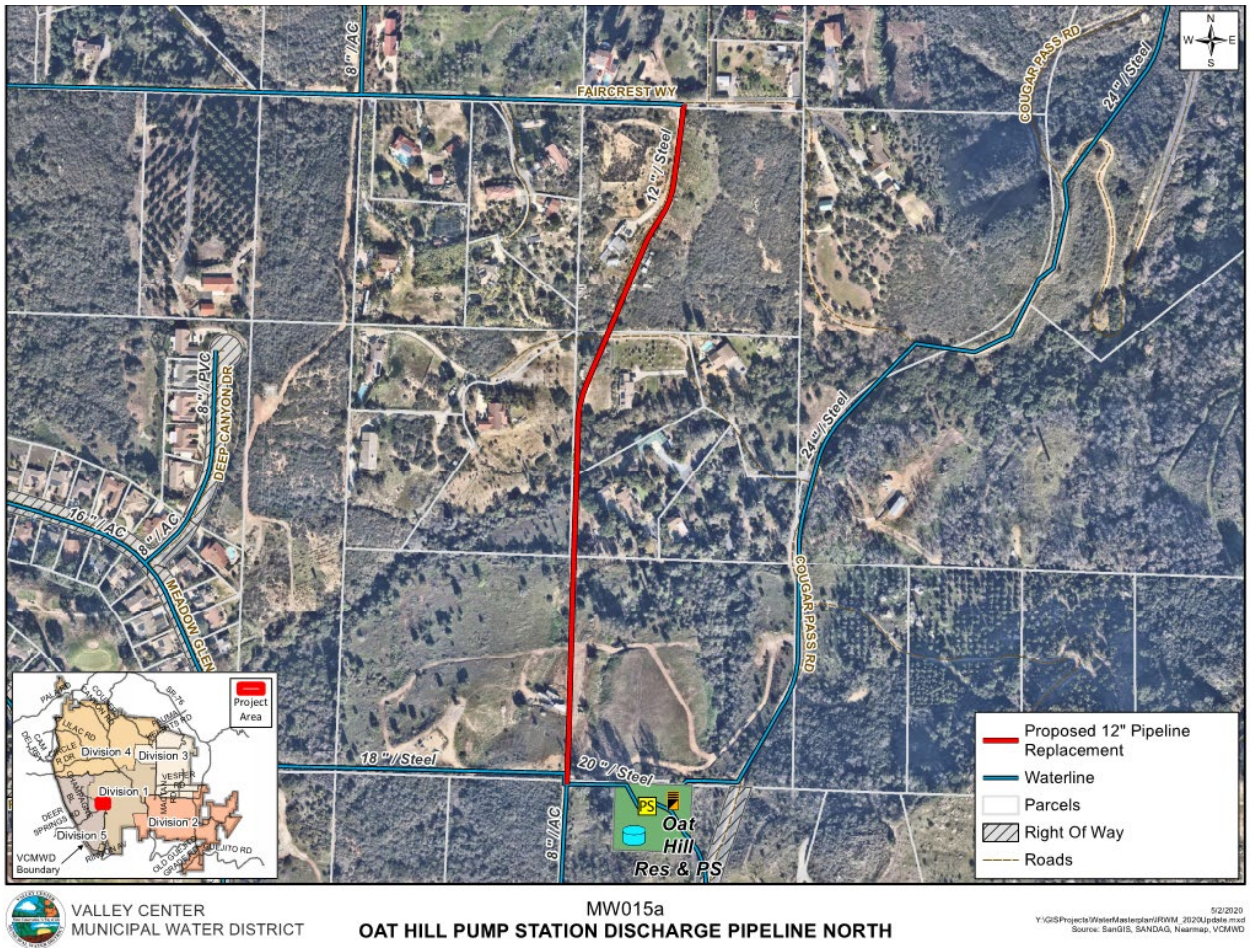
Source: SanGIS, SANDAG, Nearmap, VCMWD

MW015a – Oat Hill Pump Station Discharge Pipeline North

Description – The Oat Hill Pump Station Discharge Pipeline Project includes the removal and replacement of approximately 2,100 LF of 12-inch pipeline, water services and appurtenances within agricultural graded roads north of the Oat Hill Pump Station to Faircrest Way. The connection at Faircrest Way is one of two sources for the 1793/Meadows Service Zone. This relatively short portion of pipeline has a history of leaking issues, having had at least 5 leaks in the past 8 years causing damage to unimproved roadway.

Due to high pressures in the area and ease of installation, C900 PVC CL305 pipe will be used.
Approximate Cost - $575,000.

Oat Hill Pump Station Discharge Pipeline North



VALLEY CENTER MUNICIPAL WATER DISTRICT

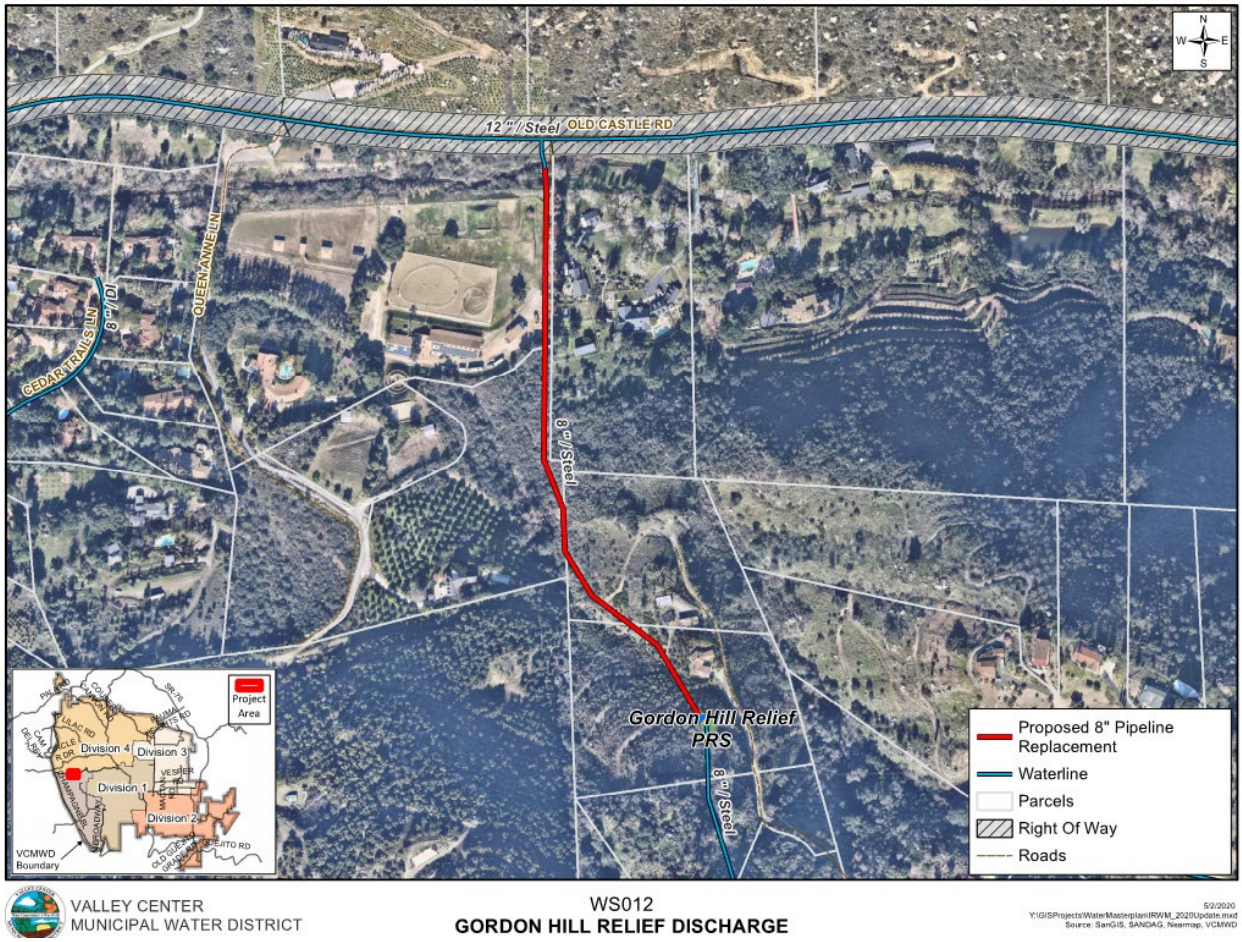
MW015a
OAT HILL PUMP STATION DISCHARGE PIPELINE NORTH

WS012-Gordon Hill Relief Discharge

Description – Installed in 1965, the existing 8-inch steel diameter pipe has reached its serviceability. The pipeline is located within private property and difficult to access to due steep terrain. Pipe failure will likely result in significant damage to private assets. Replacing approximately 1,700 LF will improve flows to the West service zone, and will continue to better serve the meters that are now in this area.

Approximate Cost - $400,000.

Gordon Hill Relief Discharge



VALLEY CENTER MUNICIPAL WATER DISTRICT

WS012
GORDON HILL RELIEF DISCHARGE

5/2/2020
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Source: SanGIS, SANDAG, Nearmap, VCMWD

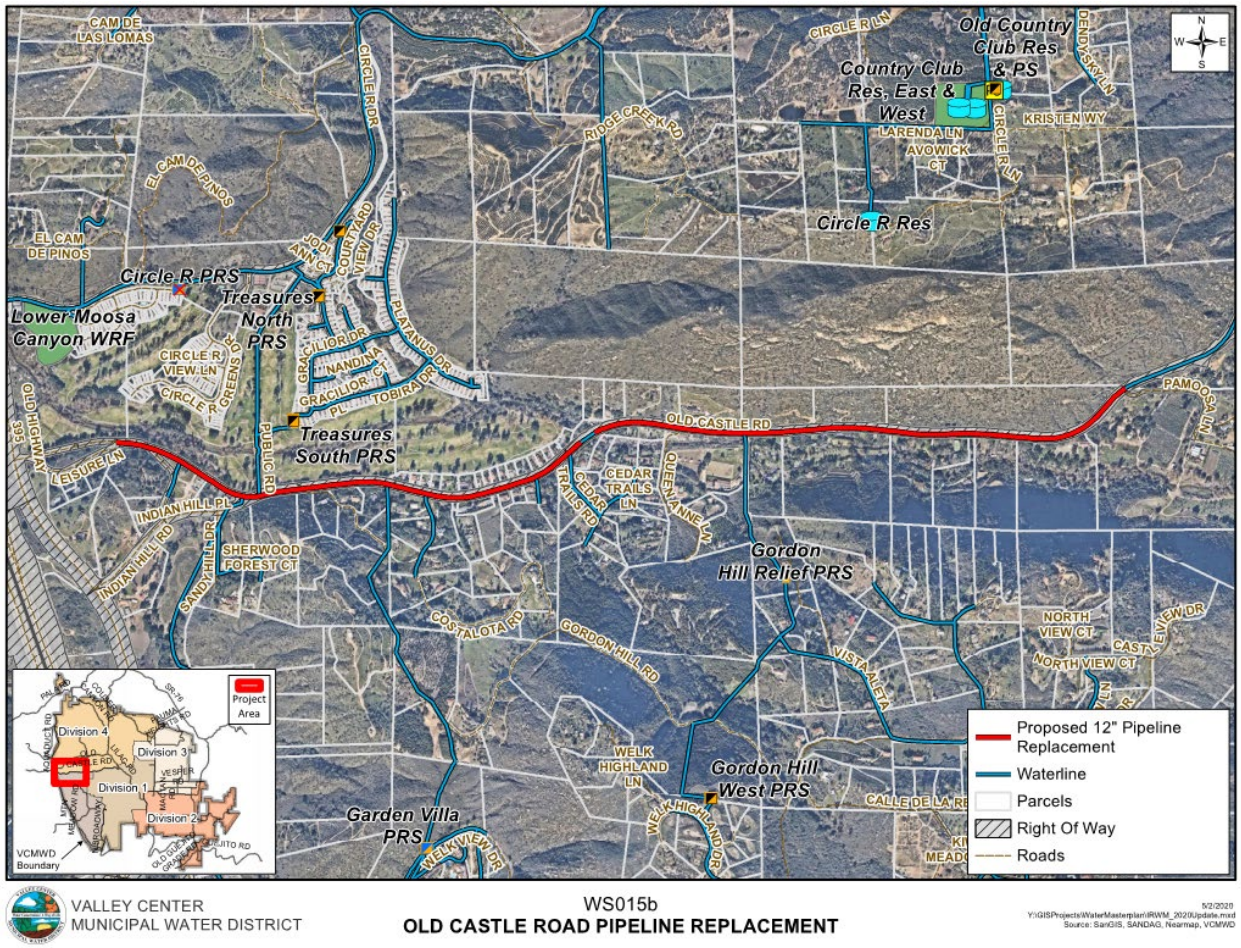
WS015b – Old Castle Road Pipeline Replacement

Description – The project consists of removal and replacement of approximately 10,900 LF of existing 12-inch tar wrapped steel pipe between Leisure Lane and Pamoosa Road. The pipeline lies within the Old Castle Road corridor and supplies water to the Welk Development to the south. The pipeline, originally installed in 1967, has reached the end of its useful life as evidenced by numerous repairs that have been necessary.

Due to high pressures in the area and ease of installation, C900 PVC CL305 pipe will be used.

Approximate Cost - $3,240,000.

Old Castle Road Pipeline Replacement

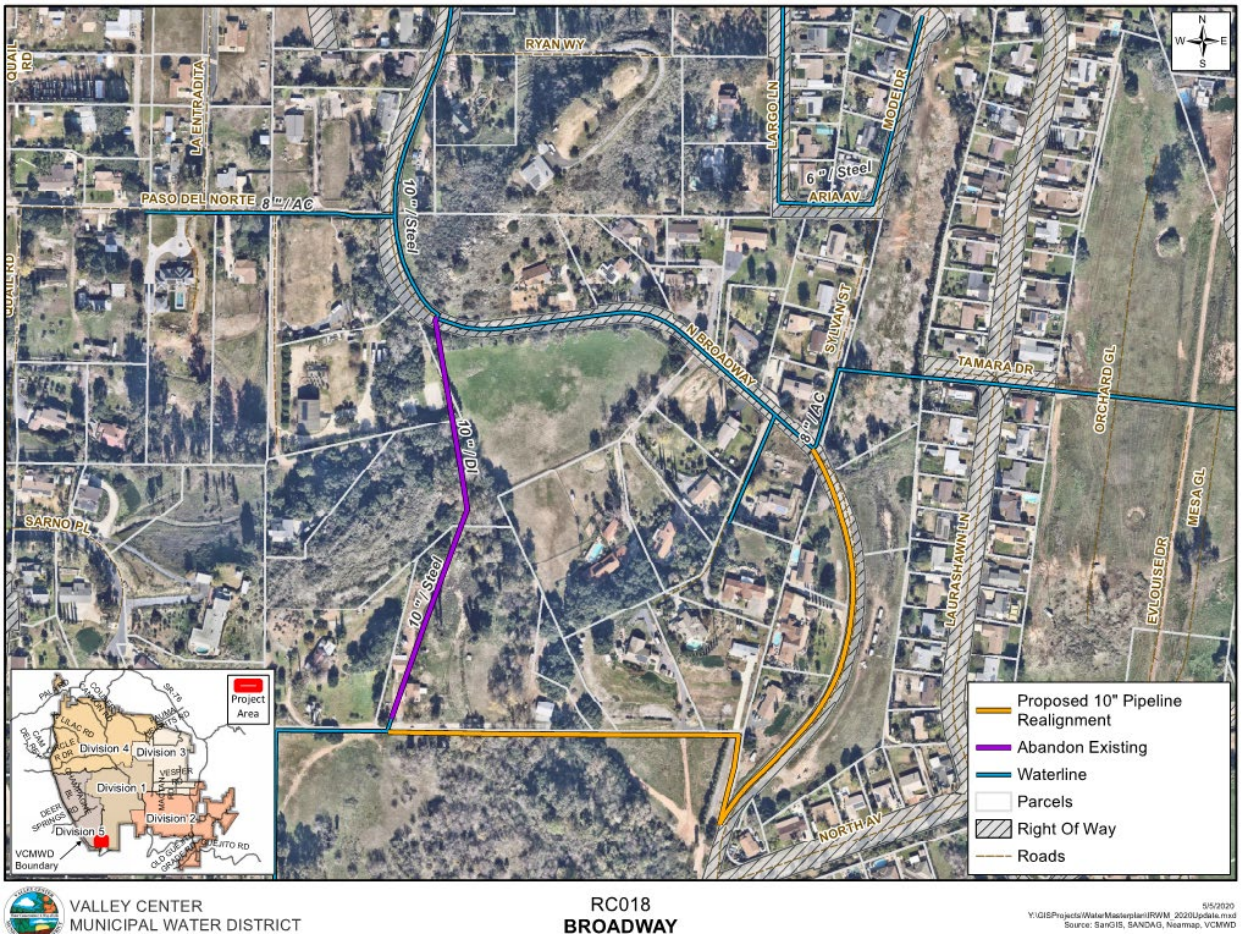


RC018-Broadway

Description – Constructed in 1994, the 10-inch steel waterline is located in the southern portion of the District in within City of Escondido limits. It serves as one of the main feeds for that area and therefore vital for maintaining reliable service to those customers. Its current alignment is problematic running through private property in an easement where a serious encroachment violation exists. The violation became first known in 2010, when District staff discovered a part of a residential home built close to the waterline alignment, less than 5 ft. in some places. The situation is solely the result of property owner actions but the cost to relocate the line or alter the residence is financially unfeasible for the property owner to bear; initiating legal action against the owner will result in costly legal fees to the District with unlikely chance of meaningful resolution. Due to its vital role and difficulty to address repairs in case of emergency because of the circumstance surrounding the encroachment violation, staff is proposing adding re-alignment of this waterline in the capital program for the near term. Staff is confident this would qualify for SRF funding, and has budgeted it accordingly to take place in the FY 22/23 timeframe. Project scope includes abandoning approximately 1,000 LF of existing 10-inch waterline and construction of 2,000 LF of new 12-inch PVC waterline and appurtenances in the new alignment shown.

Approximate Cost - $485,000.

Broadway



VALLEY CENTER MUNICIPAL WATER DISTRICT

RC018
BROADWAY

5/5/2020
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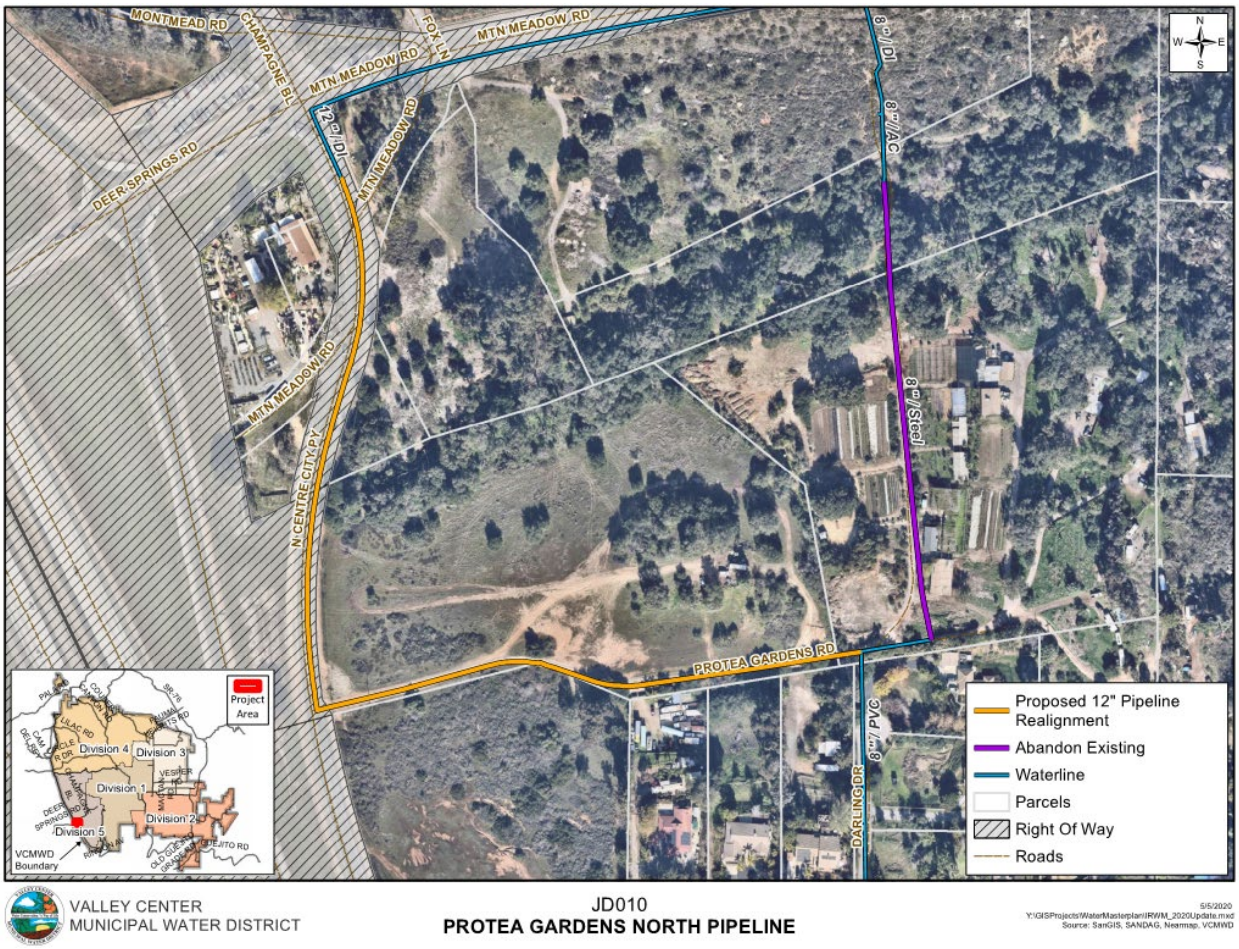
Source: SanGIS, SANDAG, Nearmap, VCMWD

JD010-Protea Gardens North Pipeline

Description – The project location is on the western limits of the District fronting the 15 freeway near the intersection of Mountain Meadow Rd and Center City Parkway. The existing alignment is on private property within a District easement through partially undeveloped parcels and residential access driveways. Constructed in 1955, it has reached the end of its designed useful life but it has not had a failure in recent history, therefore lower on the priority. The District has been approached by a number of undeveloped parcels that would be served by this line with possible development plans in the near future, which would most likely require the line to be upsized to 12 inch from the current 8 inch to meet demands. At that time, the District will require it to be re-aligned along Center City to comply with current standards. Currently the project need is driven by development and its timing will coincide with the proposed development currently projected to take place in FY 2022/23. If the District's sees need to execute sooner without developer participation it would qualify for SRF funding, and may as well with developer involvement to be further evaluated at that time. Scope includes relocating 1000 LF of waterline along Center City Parkway from Mountain Meadow Rd to Protea Gardens. Cost could vary based on developer participation.

Approximate Cost - $320,000.

Protea Gardens North Pipeline

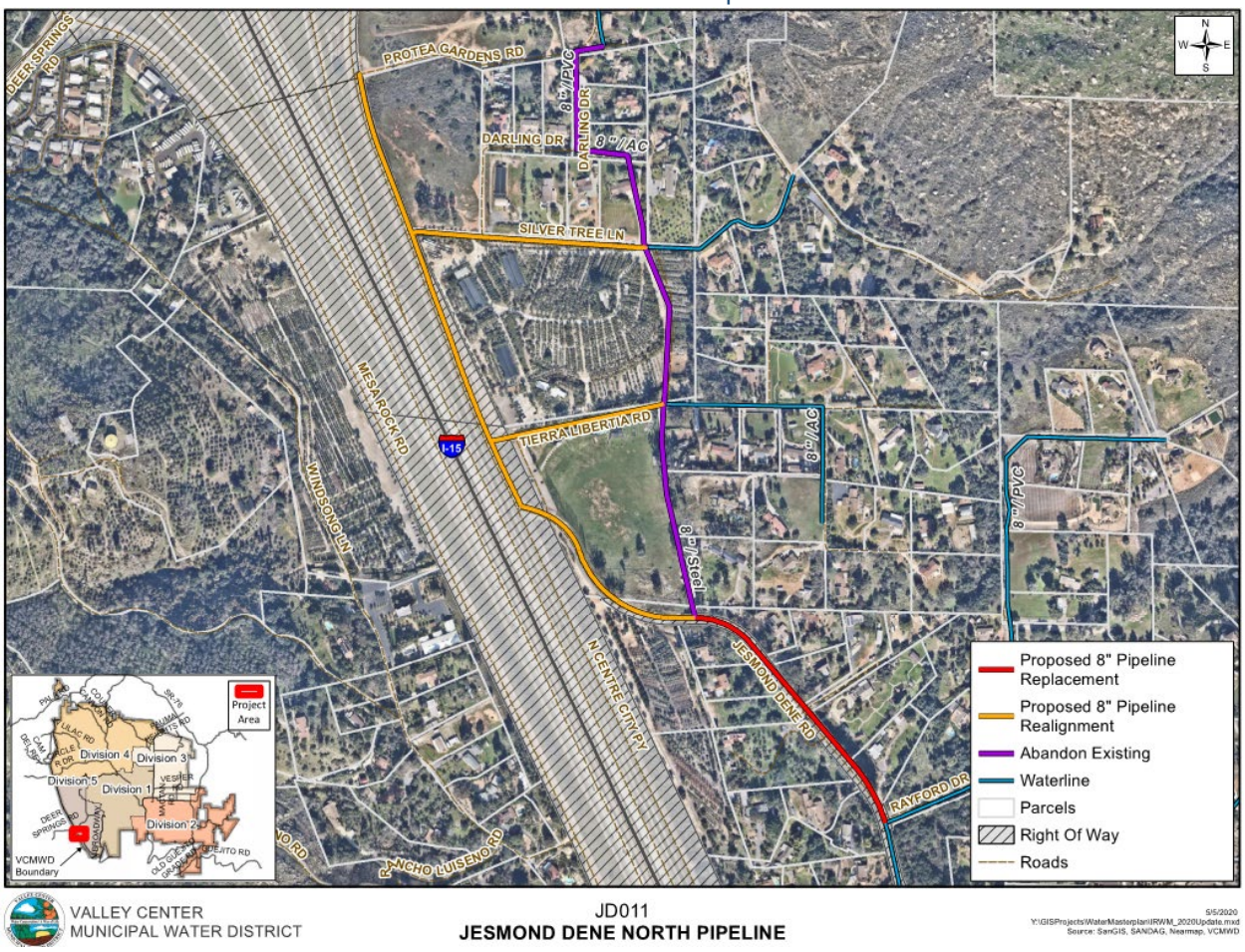


JD011-Jesmond Dene North Pipeline

Description – The project is a continuation of JD010 – Protea Gardens North Pipeline, involving replacement and re-alignment of an existing 8-inch steel waterline installed in 1955. Although it has not experienced major failure in the past, it has surpassed its designed useful life, and with less than ideal current alignment is a good candidate for replacement in the near term. The line is located on private property within District easements, with portions being difficult to access and in close proximity to private structures increasing the liability to the District in case of a failure. The current timing is consistent with the Protea Gardens project as they are interconnected, and executing both concurrently would be the most efficient approach. Developer involvement is not expected for this portion and would be fully funded by the District using SRF funding. Scope includes abandoning and replacing 2600 LF of 8-inch waterline within Center City Parkway between Protea Gardens and Jesmond Dene Road. Project will include relocating existing water services to be served from the new alignment.

Approximate Cost - $2,000,000.

Jesmond Dene North Pipeline

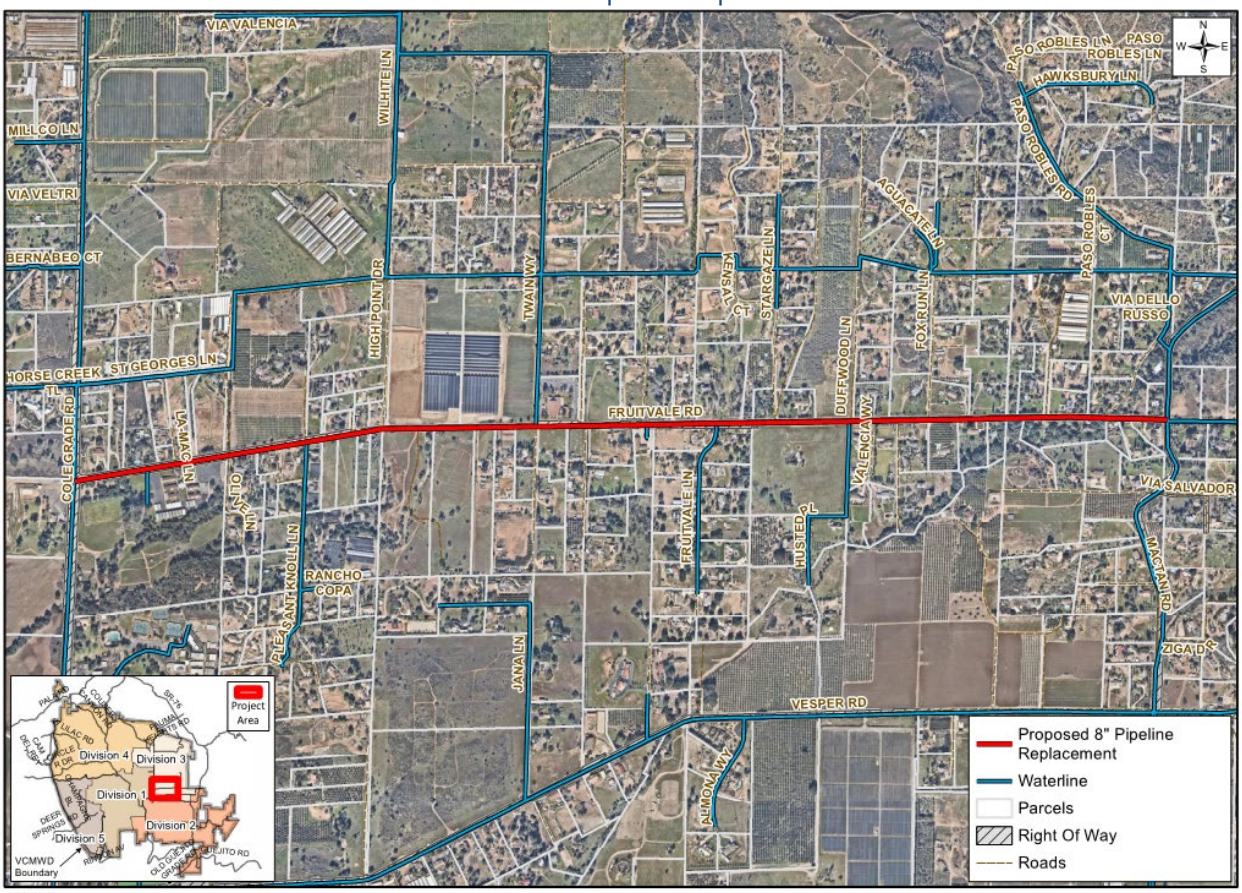


CV012a – Fruitvale Road Pipeline Replacement

Description – Within Fruitvale Road remove and replace approximately 9,400 LF of 8-inch steel pipeline between Cole Grade Road and Mactan Road. Install additional valves and appurtenances to improve operational redundancy and to minimize customer service interruptions during shutdowns.

Approximate Cost - $2,800,000.

Fruitvale Road Pipeline Replacement



VALLEY CENTER MUNICIPAL WATER DISTRICT

CV012
FRUITVALE ROAD PIPELINE REPLACEMENT

5/2/2020
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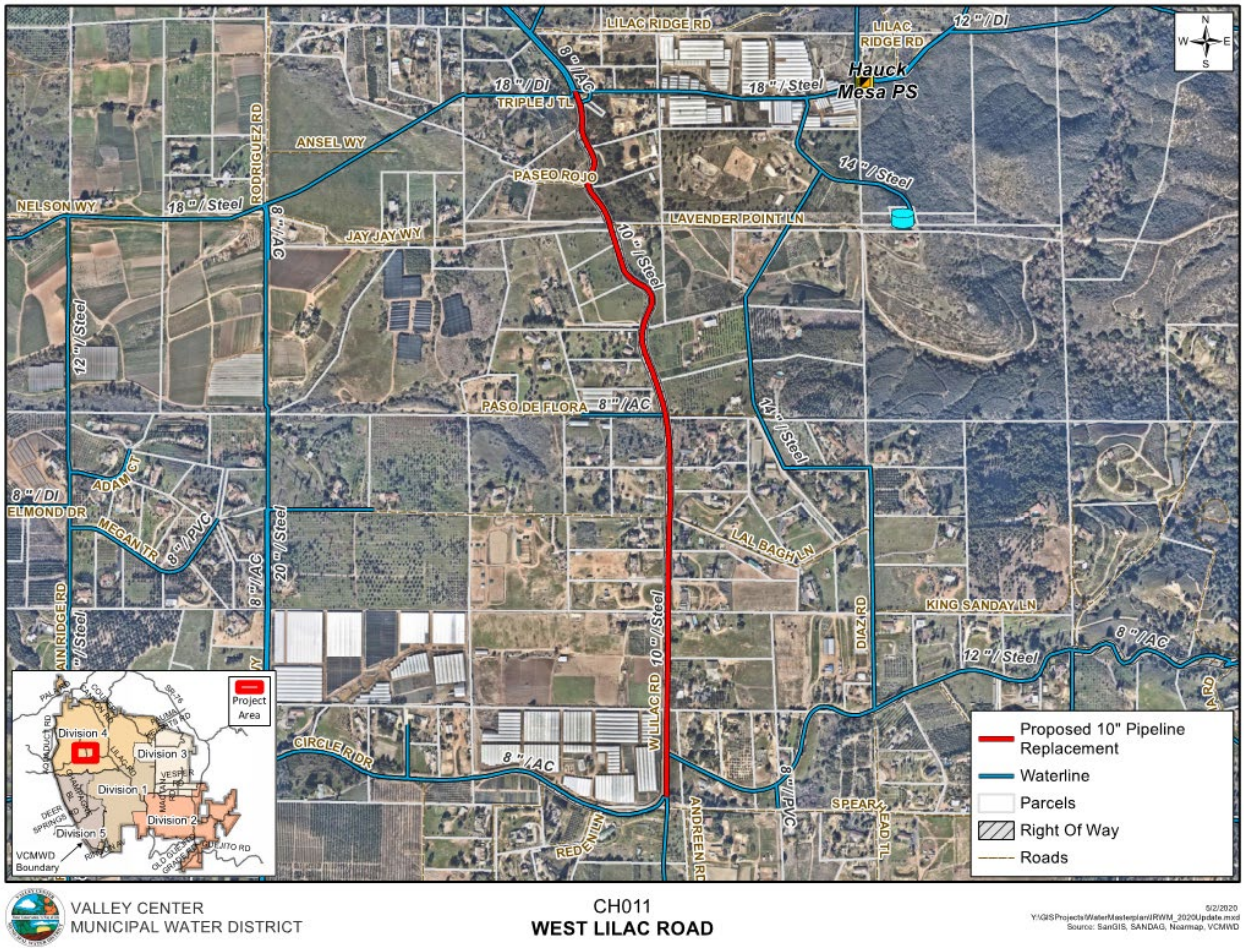
Source: SanGIS, SANDAG, Nearmap, VCMWD

CH011-West Lilac Road

Description –The project consists of removal and replacement of approximately 5,000 LF of 10-inch steel pipe, associated appurtenances and water service laterals. The pipeline replacement limits are from West Lilac Road intersection with Spearhead Trail and Triple J Trail. The pipe installed in 1955 has had numerous repairs, thus is nearing its service life.

Approximate Cost - $1,500,000.

West Lilac Road



VALLEY CENTER MUNICIPAL WATER DISTRICT

CH011
WEST LILAC ROAD

5/2/2020
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Source: SanGIS, SANDAG, Nearmap, VCMWD

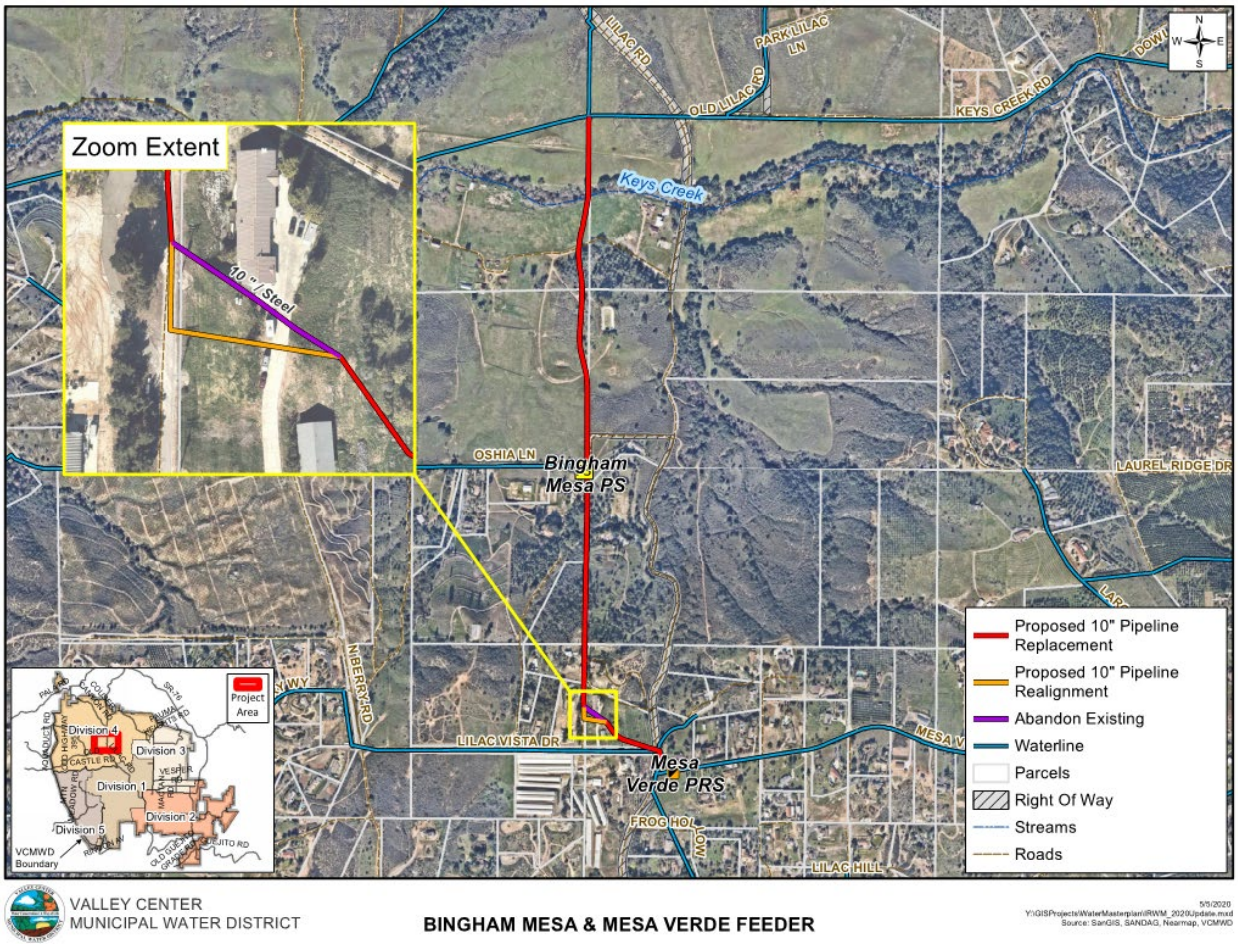
LL012 & LL013-Bingham Mesa & Mesa Verde Feeder

Description –The project consists of the removal of replacement of approximately 5,500 LF of steel pipeline constructed in 1957. Mesa Verde Feeder segment runs from the intersection of Lilac Road and Mesa Verde (adjacent to Mesa Verde Pressure Reducing Station) to Bingham Mesa Pump Station. Most of the pipeline traverses private property. A portion of the pipeline will be realigned to go around a home that was constructed adjacent to the waterline.

Bingham Mesa Feeder segment runs from Bingham Mesa Pump Station to a four way pipeline cross, located approximately 650 LF north of Keys Creek and 650 LF west of Lilac Road.

Approximate Cost- $1,500,000

Bingham Mesa & Mesa Verde Feeder

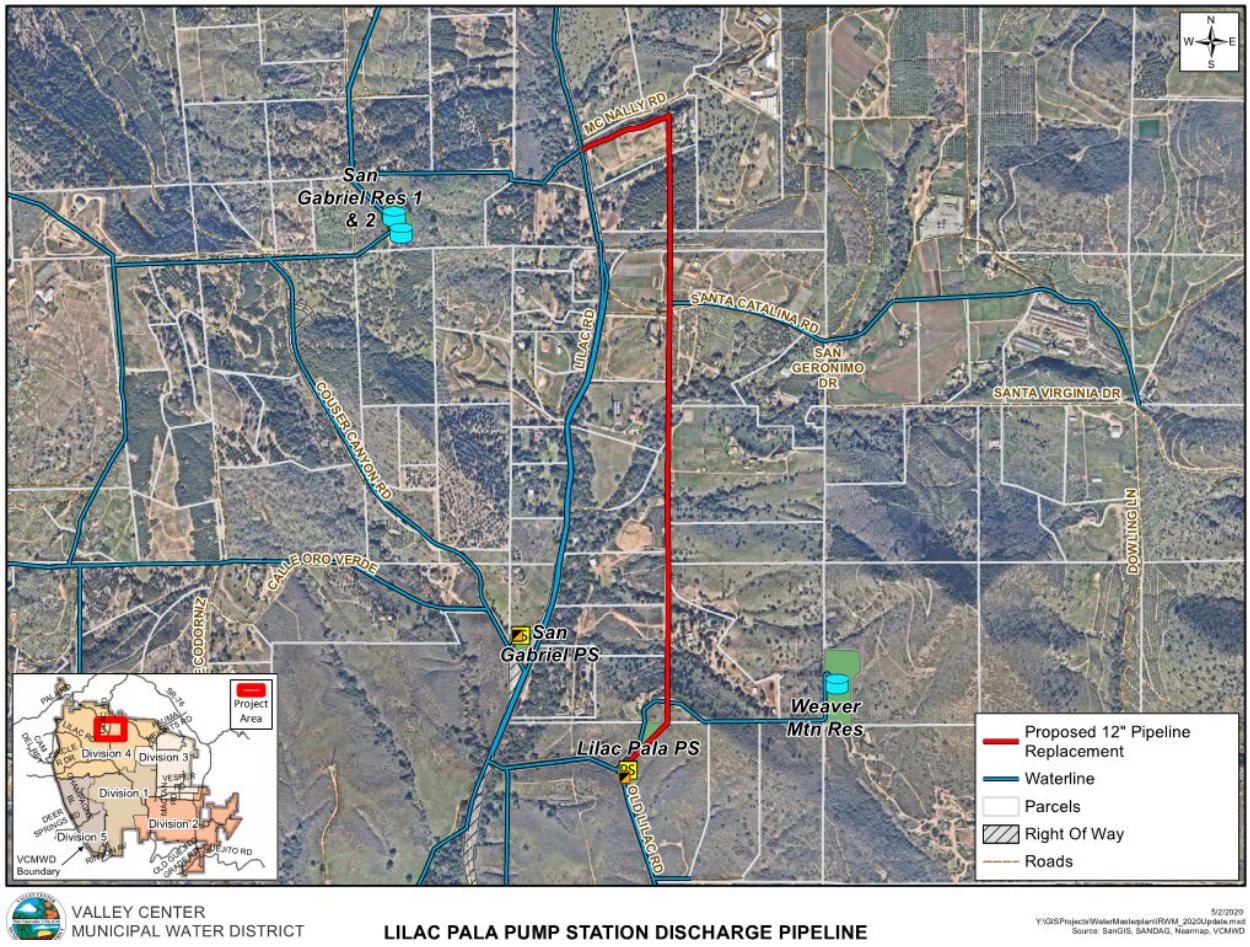


SG022 – Lilac Pala Pump Station Discharge Pipeline

Description – Replace approximately 6,500 LF of 12-inch pipe within unimproved roadways between the Lilac Pala Pump Station and McNally Road. This pipeline has experienced deterioration at the pipe joints resulting in several leaks within the past several years. Due to high pressures in the area and ease of installation, C900 PVC CL305 pipe will be used

. Approximate Cost - $1,850,000.

Lilac Pala Pump Station Discharge Pipeline



Direct Funded Projects

CV011 – Cole Grade Road Pipeline Replacement

Description – Approximately 14,100 LF of ductile iron pipe of various sizes are within the limits of the Cole Grade Road Widening Project. Approximately 7,500 linear feet of pipe were installed on the west side of road centerline in the 1990's, and will remain in place. However, several short sections of this pipe will be redesigned to avoid conflicts with County proposed storm drain crossings.

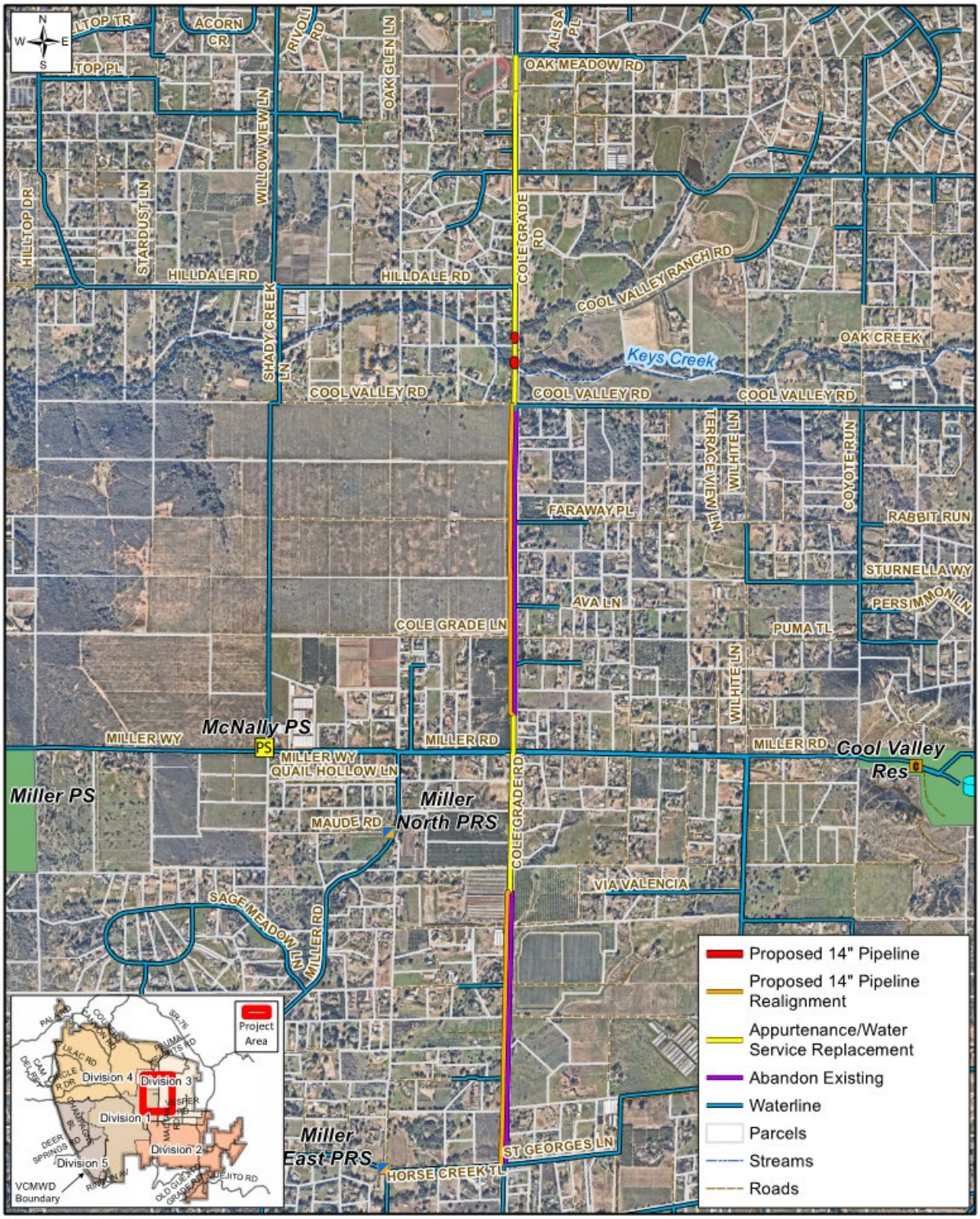
Phase I Road Widening Water Improvements consists of the installation of new water services and appurtenances between Cool Valley Road and Pauma Heights Road. Furthermore, water main realignment is required at a bridge and culvert crossing north of Cool Valley Road.

Existing water pipes east of centerline were installed in the 1950's and are approaching the end of their life cycle. Phase II Water Improvements consists of the abandonment of the existing water line and installation of approximately 6,600 linear feet of new 14-inch water main, west of road centerline between Fruitvale Road and Cool Valley Road. Work also includes the installation of new valves, water services and appurtenances. Due to high pressures in the area, corrosive soils and ease of installation, C900 PVC CL305 pipe will be used.

The Districts design drawings will be included in the County's Cole Grade Road widening project bid package.

Approximate Cost - $4,373,000.

Cole Grade Road Pipeline Replacement



VALLEY CENTER MUNICIPAL WATER DISTRICT

CV011

COLE GRADE ROAD PIPELINE REPLACEMENT

5/11/2020
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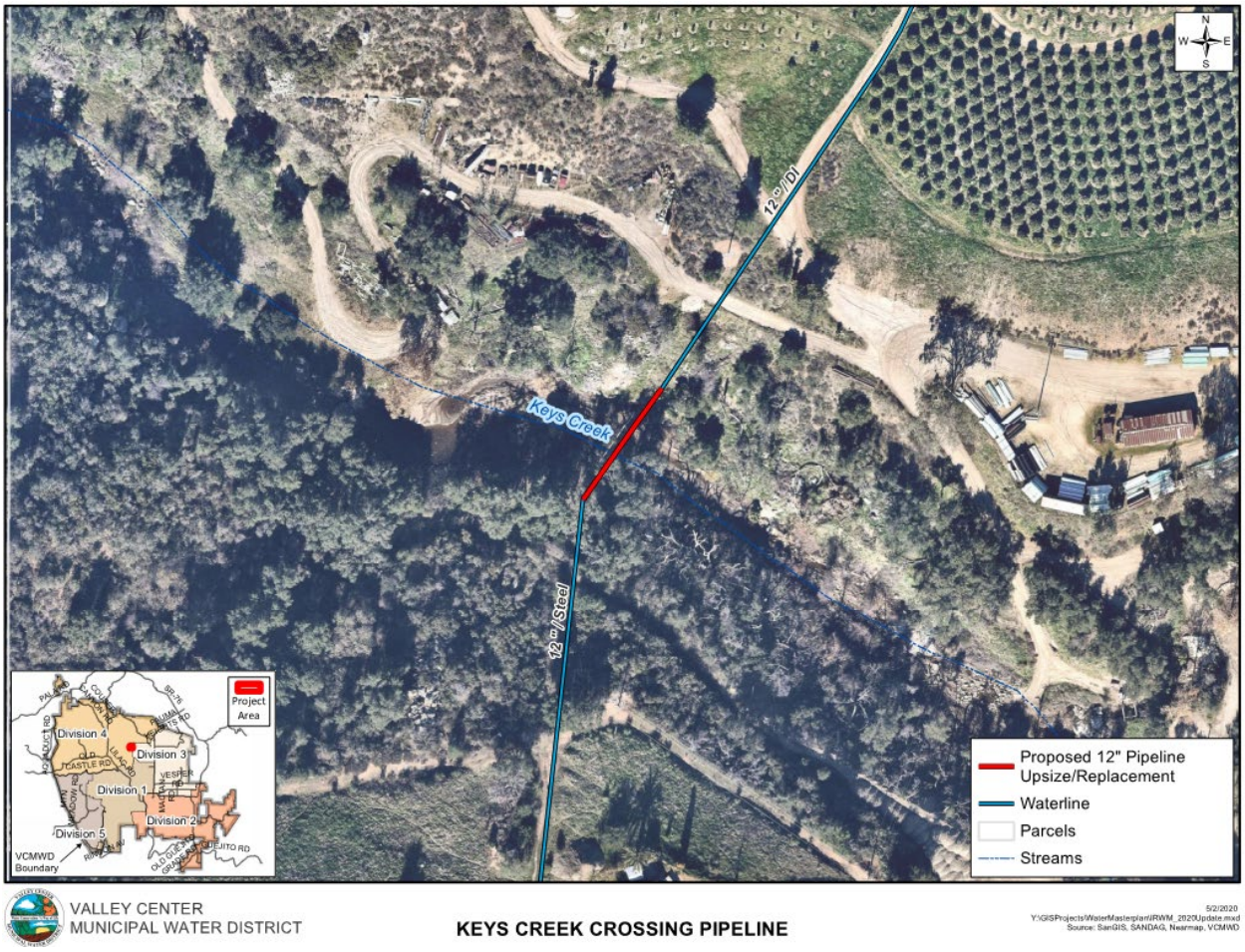
Source: SanGIS, SANDAG, Nearmap, VCMWD

MZ002-Keys Creek Crossing Pipeline

Description – Currently, a 12-inch DIP reduces to a 6-inch pipeline that traverses Keys Creek above grade. Throughout the years, erosion has undermined the channel bank, thus exposing portion of the underground 12-inch Ductile Iron Pipe. The project consists of the removal of the 6-inch waterline, upsize to a 12-inch and designed to be 1-foot above the 100-year Keys Creek water surface elevation. This will require abutments outside of the channel banks and vertical pipe alignment changes. Upsizing the section of pipe will improve operation in the event of another failure of the 42-inch Bar Wrapped CCP transmission main.

Approximate Cost -$300,000.

Keys Creek Crossing Pipeline



VALLEY CENTER MUNICIPAL WATER DISTRICT

KEYS CREEK CROSSING PIPELINE

5/2/2020
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Source: SanGIS, SANDAG, Nearmap, VCMWD

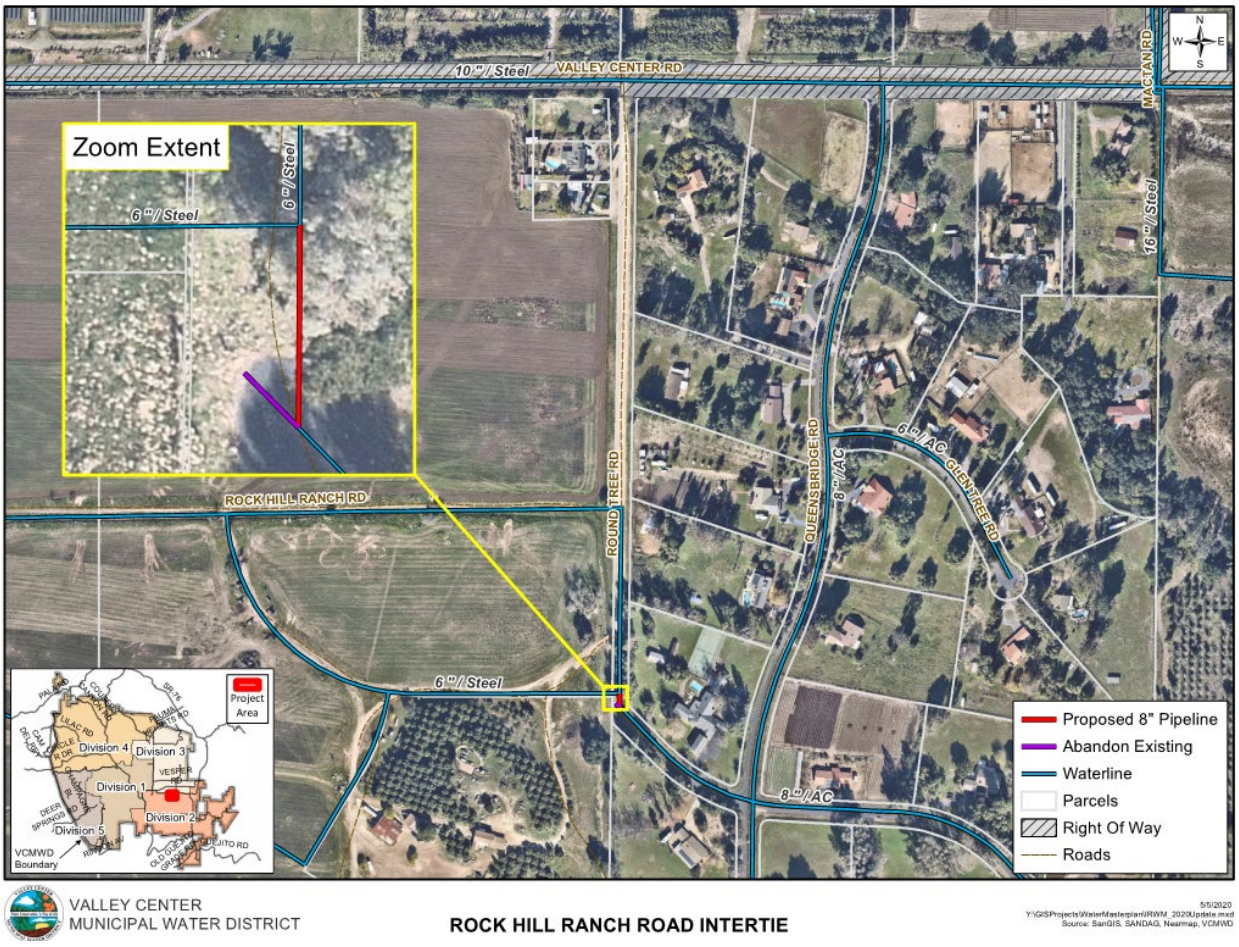
CV017a – Rock Hill Ranch Road Intertie

Description – The Rock Hill Road Intertie Project consists of approximately 50 LF of 8-inch pipe, valves and pipeline connections within Round Tree Road, south of Rock Hill Road. The new piping and connections will tie two long dead-end lines together which will improve water quality, flows, and pressures in the general area and provide operational redundancy in an area of very old (1958) pipeline.

Due to ease of installation PVC is the preferred pipe material.

Approximate Cost - $125,000.

Rock Hill Ranch Road Intertie

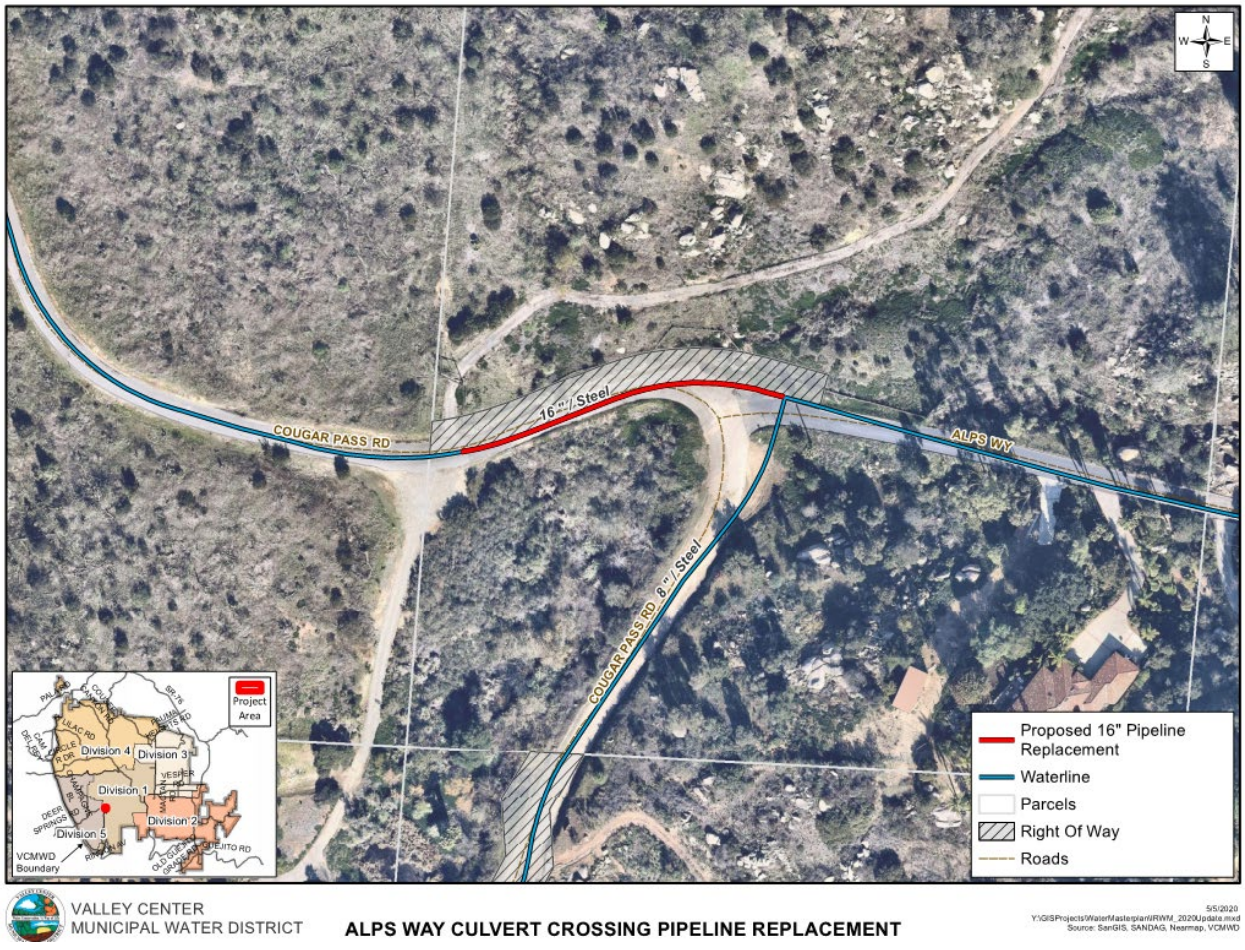


CV018a - Alps Way Culvert Crossing Pipeline Replacement

Description – Replace approximately 330 LF of existing 16-inch diameter waterline below two storm drain culverts within Alps Way west of Cougar Pass Road and realign approximately 100 LF of existing 8-inch waterline within Cougar Pass Road at Alps Way. These modifications will allow the District to fully use the capacity of this pipeline. Operations have been limiting the flow rate through this pipe to avoid another blowout like the one that caused major property damage previously. Due to ease of installation, PVC is the preferred material for this project.

Approximate Cost - $225,000.

Alps Way Culvert Crossing Pipeline Replacement



VALLEY CENTER MUNICIPAL WATER DISTRICT

ALPS WAY CULVERT CROSSING PIPELINE REPLACEMENT

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Source: SanGIS, SANDAG, Nearmap, VCMWD

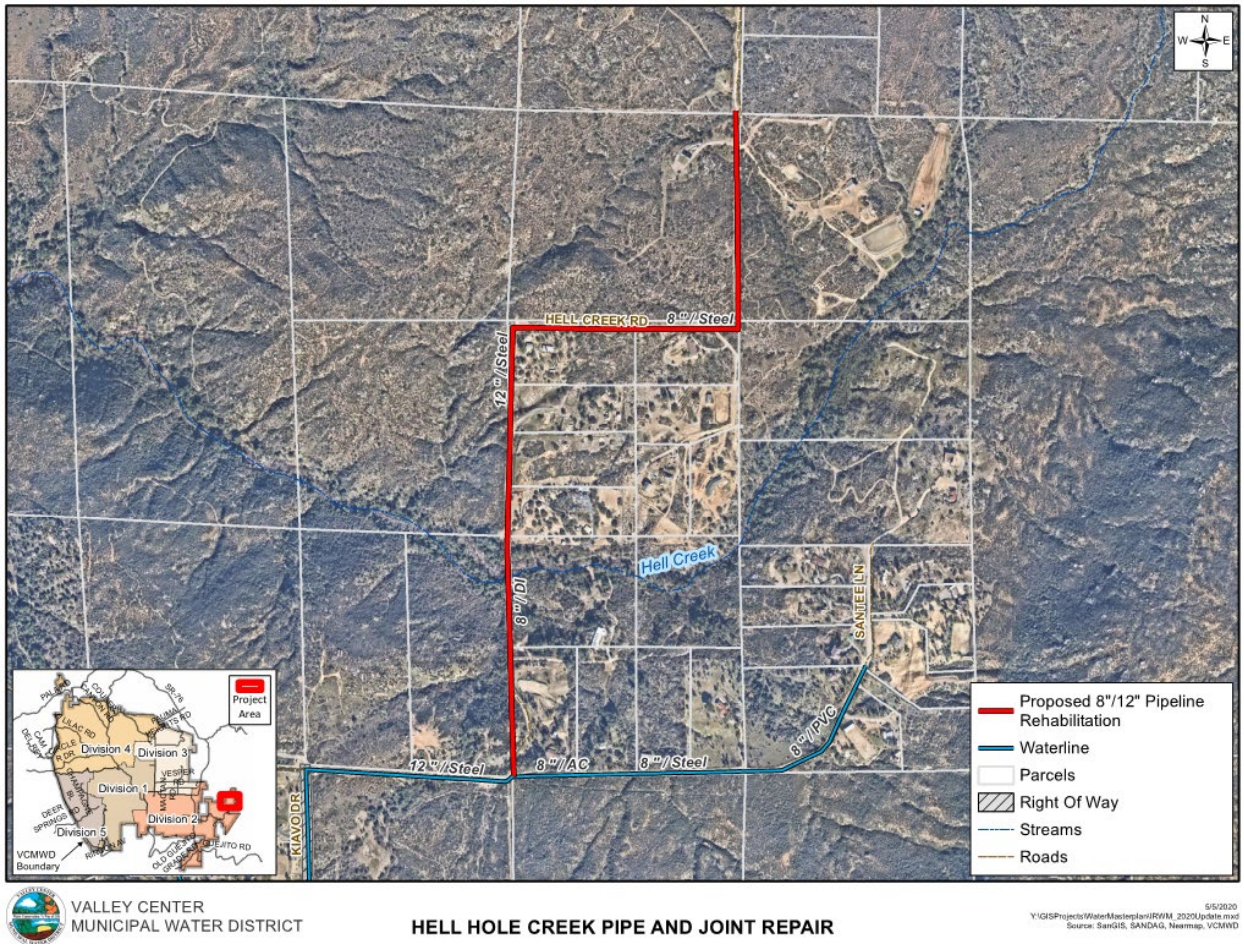
Direct Funded Trenchless Projects

PD016 – Hell Hole Creek Pipe Joint Repair

Description – Located within Hell Creek Road from Santee to terminus, constructed in 1969, approximately 5300 LF of 8 and 12 inch steel waterline serving north portion of 2333/Paradise Service Zone. The line has experienced a number of leaks in recent years, with the cause linked to failure at the joints only, with the majority of the line appearing to be in good shape. A trenchless product exists which allows joint liners to be inserted through access points to reinforce those areas without the need to excavate each joint.

Approximate Cost - $750,000.

Hell Hole Creek Pipe Joint Repair



VALLEY CENTER MUNICIPAL WATER DISTRICT

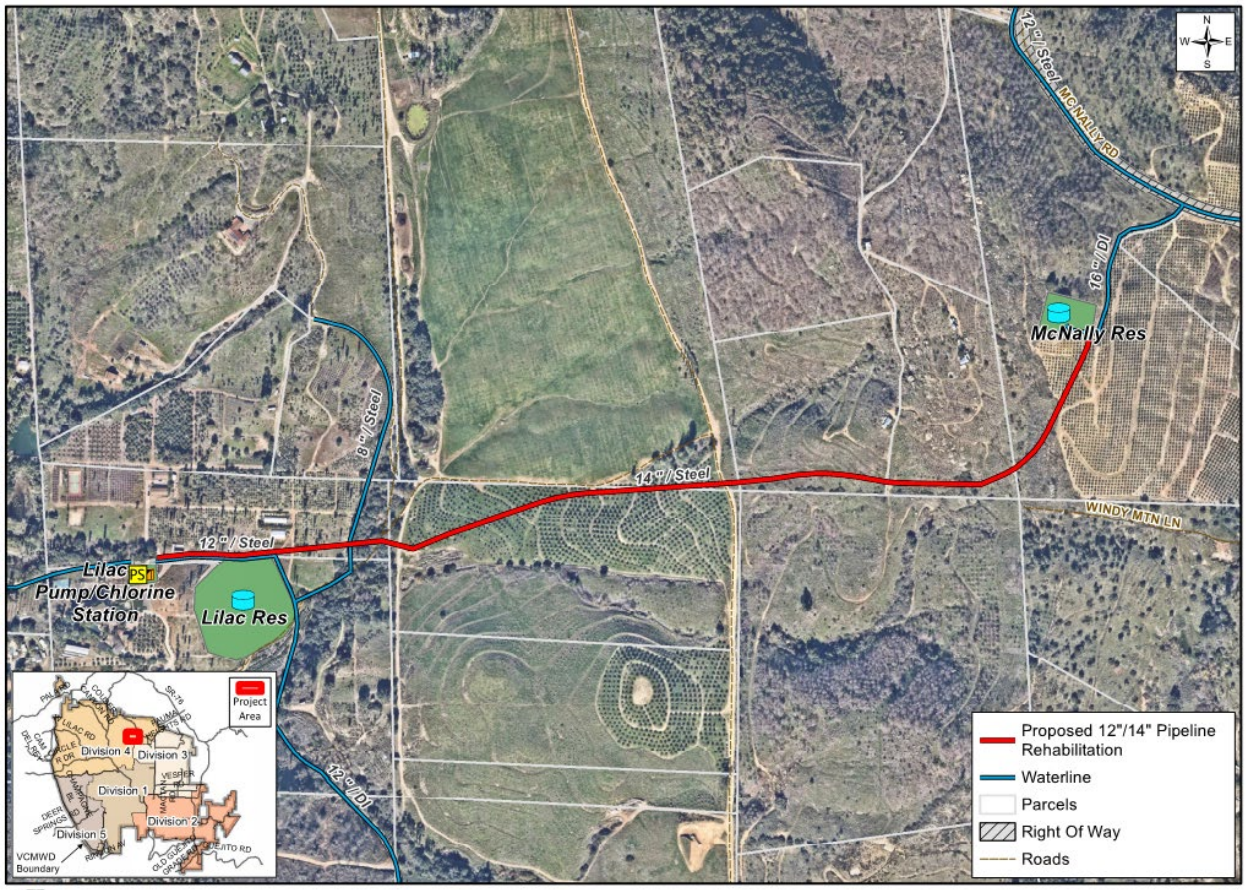
HELL HOLE CREEK PIPE AND JOINT REPAIR

CV010 - McNally Reservoir Feeder

Description – Located between Lilac Reservoir and McNally Reservoir, the 14 inch steel waterline constructed in 1957 serves as the main feeder line to supply the McNally Reservoir. The approximately 4500LF section is aligned within Staley Ranch a private agricultural grove. The alignment runs through grove roads, creek crossings and about 1500LF up a steep hill side, where access is challenging. The circumstances lend this project to be a good candidate for trenchless construction, utilizing a structural flexible liner that would be installed inside the existing line via multiple access points. Several meters and appurtenances such as air vacs and blowoffs will require to be relocated as well.

Approximate Cost - $1,000,000

McNally Reservoir Feeder



VALLEY CENTER MUNICIPAL WATER DISTRICT

MC NALLY RESERVOIR FEEDER

5/5/2020
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Source: SanGIS, SANDAG, Nearmap, VCMWD

Pipeline Projects Beyond the Near-Term

The present schedule of pipelines projects that will be constructed in the timeframes of 6 to 10 years, and 11-20 years from now are presented in Table P-2. The locations of these projects are reflected on the map in Appendix A. Due to the multitude of factors affecting project priority, the order in which these projects are performed is uncertain at this time. It is, in fact, possible that some of these projects may be moved to the near term over the course of the next five years.

These pipelines have been identified as assets requiring replacement due to their potential for failure. Most of the pipelines were constructed of tar-wrapped steel which has posed reliability problems in the past. However, it is entirely possible that a pipeline made of other materials may begin to experience excessive leakage (breakage) or show significant deterioration upon inspection. When this occurs, the extent of breakage or deterioration would be assessed by District Engineering and Operations staff, the criticality of the pipeline to District operations would be weighed and the pipeline would be reprioritized in the pipeline replacement schedule, as appropriate.

The schedule for pipeline replacement can also be impacted by the actions of other agencies. An example of this is County of San Diego road paving projects. When the county decides to repave or re-align a road in our area, there is likely a water pipeline located in that road right-of-way that may need to be relocated or re-constructed in some fashion. When this occurs, the District must respond by either: 1) designing the required pipeline changes, then constructing before or in conjunction with the County, or 2) waiting 3 years after county construction is complete to take any action on the pipeline due to the County's "no cut" policy 3 years after road completion. Either of these scenarios could impact the original timing of the pipeline project as shown on our schedule.

Thus, as discussed above, a pipeline project identified beyond the 5-year timeframe generally represents a work effort that is on the horizon, but the specifics of that work will be become clearer and more defined as that timeframe draws near. The magnitude of replacements annually required are generally determined using industry standards tempered by local knowledge of the District. Over time, as breakage rate history and deterioration monitoring become more refined, improvement in predicting required pipeline replacements are anticipated.

Opinion of Probable Cost

Table P-1 Summary of Pipeline Projects Near-Term

SUMMARY OF PIPELINE PROJECTS - NEAR TERM							
PROJ _ID	**NAME**	**FY 2020-21**	**FY 2021-22**	**FY 2022-23**	**FY 2023-24**	**FY 2024-25**	**FY 2020-25**
			SRF FUNDED				**0-5 Years**
DW001	Gordon Hill Rd Pipeline	$50,000	$1,250,000	$0	$0		**$1,300,000**
CV050a	Lilac Rd Upsize	$50,000	$2,950,000	$0	$0		**$3,000,000**
MW015	Oat Hill Discharge Pipeline North	$100,000	$475,000	$0	$0		**$575,000**
WS012	Gordon Hill Relief Discharge	$0	$50,000	$350,000	$0		**$400,000**
WS015b	Old Castle Road Pipeline - Phase 2	$0	$480,000	$2,760,000	$0		**$3,240,000**
RC018	Broadway South	$0	$50,000	$435,000	$0		**$485,000**
JD010	Protea Gardens North Pipeline(Developer)	$0	$0	$50,000	$270,000		**$320,000**
JD011	Jesmond Dene North Pipeline	$0	$0	$300,000	$1,700,000		**$2,000,000**
CV012	Fruitvale Road Pipeline	$0	$0	$500,000	$2,300,000		**$2,800,000**
CH011	West Lilac Rd	$0	$0	$0	$300,000	$1,200,000	**$1,500,000**
LL012	Bingh Mesa & Mesa Verde Feeder	$0	$0	$0	$250,000	$1,250,000	**$1,500,000**
SG022	Lilac Pala PS Discharge Pipeline	$0	$0	$0	$350,000	$1,500,000	**$1,850,000**
	SRF Funded Grand Totals	**$200,000**	**$5,255,000**	**$4,395,000**	**$5,170,000**	**$3,950,000**	**$18,970,000**
			DIRECT FUNDED				
CV011	Cole Grade Road Pipeline	$350,000	$1,100,000	$2,800,000			**$4,373,000**
MZ002	Keys Creek	75,000	$225,000	$0			**$300,000**
CV017a	Rock Hill Ranch Road Intertie	$125,000	$0	$0			**$125,000**
CV018a	Alps Way Culvert Crossing Pipe Replacement	$225,000	$0	$0			**$225,000**
PD016	HellHole Creek Joint Repair*	$100,000	$650,000	$0			**$750,000**
CV010	McNally Reservoir Feeder*	$1,000,000					**$1,000,000**
	Direct Funded Totals	**$1,875,000**	**$1,975,000**	**$2,800,000**	**$0**	**$0**	**$6,773,000**
	SRF and Direct Funded Total	**$2,075,000**	**$7,230,000**	**$7,195,000**	**$5,170,000**	**$3,950,000**	**$25,743,000**

$$$$ - Designates Design/SRF Application Phase

$$$$ - Designates Construction Phase

*Designates projected proposed using Trenchless method

Table P-2 Summary of Pipelines Projects Future Term

PROJ_ID	NAME	FY 2025-30	FY 2031-40
		6-10 Years	11-20 Years
DW003	Cool Valley Rd Upsize	$2,200,000	$0
CH002	Rodriguez Road Pipeline	$2,730,000	$0
WS010	Nelson Way Pipeline	$623,000	$0
RC016	Reidy Canyon Creek Crossing	$81,000	$0
RC011	Broadway/Ryan Pipeline	$248,000	$0
RC013	Laurashawn Area Piping	$2,768,000	$0
CV025	Cobb Discharge Pipeline	$3,922,000	$0
LL010	Lilac PS Feeder	$3,576,000	$0
CV013	Banbury Area Pipelines	$0	$3,115,000
CV014	Banbury/VC Road Pipeline	$0	$548,000
CV015	Valley Center Road Pipeline	$5,912,000	$0
CV016	Sunset Road Pipeline	$0	$952,000
MZ001	Mesa Verde	$900,000	$0
MZ015	Mesa Crest	$1,100,000	$0
WV010	Weaver Feeder	$2,500,000	$0
CV017b	Rock Hill Ranch Road Area Pipelines	$0	$923,000
CV019	Mirar de Valle Pipeline - West	$0	$4,845,000
	TOTAL	$26,560,000	$10,383,000

Reservoirs

Overview

Valley Center MWD has 42 covered reservoirs, and one open reservoir, Turner Dam. Thirty-seven of these reservoirs are steel and 5 of them are floating cover with geotextile liners. Please refer to map in Appendix A which presents the location of these reservoirs. District experience has been that coatings begin to fail in the 12 to 14 year range. When coatings deteriorate, the steel underneath can be affected, and corrosion can set in accompanied by loss of steel rafter/wall/roof thickness. This loss of steel can result in the reservoir eventually losing its structural integrity which leads to the need to replace the roof, or even the entire reservoir. Maintaining the coating is an excellent method of protecting the asset value of reservoirs and extending their useful lives. The maximum useful life of a reservoir has been tied to the type and frequency of tank maintenance. Given the proper maintenance, expected useful life of steel tank reservoirs could extend beyond 100 years.

Steel reservoirs require recoating approximately every 15 years in order to maintain their viability. Considering information currently available, it appears that an annual investment of approximately $1.5 million is required simply to maintain reservoir coating condition. Prior to the drought the District was maintaining such a sustainable reservoir coating cycle. However, due to financial constraints brought on by the drought, reservoir coatings were deferred in favor of more urgent projects. Because of these deferred coating projects, an annual outlay greater than $1.5 M would be required to catch up on the coatings themselves. The fact that coating projects have been deferred is likely going to result in the need to replace an unknown number of rafters and earthquake straps, which would increase the projected costs. A contingency of 10% to account for these expenses has been included, though the actual cost may vary greatly from this.

Floating cover reservoirs present a different approach to providing water storage. The covers and liners of these reservoirs have low initial costs compared to steel tanks but are also somewhat limited in their useful life expectancy. Generally, 20 to 25 years is expected for the life of a floating cover and liner, with some estimates ranging to 30 years for new materials. All of the District's floating covers have recently been replaced, and thus are beyond the 20 year window of this master plan update. Somewhat minor maintenance is required to attain the projected useful life. No major maintenance is expected between the time one installs the cover and liner and the time that the cover and liner are replaced.

Table R-1 presents a list of reservoirs and their characteristics. The size and tank age are shown, along with a column labeled "R&R age". The latter refers to the number of years it has been since the tank received a major Rehabilitation/Repair (R&R).

Table R-1 Reservoir Characteristics

RESERVOIR CHARACTERISTICS				
NAME OR DESIGNATION	TYPE/MATERIAL	CAPACITY (mg)	Facility AGE	R&R AGE
Betsworth	Steel Tank	1	54	5
Betsworth Forebay 1	Steel Tank	0.5	54	20
Betsworth Forebay 2	Steel Tank	1.97	34	20
Burnt Mt.	Steel Tank	1	53	17
Circle R	Steel Tank	0.1	54	23
Cobb	Floating Cover/Hypalon	8.8	54	7
Cool Valley	Floating Cover/Hypalon	55.9	45	3
Country Club, East	Floating Cover/Hypalon	5.1	5	5
Country Club, West	Floating Cover/Hypalon	5.1	5	5
Couser	Steel Tank	1.5	54	30
Hauck Mesa	Steel Tank	0.65	57	15
Jesmond Dene	Steel Tank	0.42	49	22
Kornblum	Steel Tank	2.4	30	30
Lilac	Floating Cover/Hypalon	4.7	64	31
Mactan	Steel Tank	1.5	54	25
McNally	Steel Tank	2	64	13
Meadows #1	Steel Tank	2	54	14
Meadows #2	Steel Tank	2	14	14
Mizpha	Steel Tank	1	53	13
MJM	Steel Tank	0.5	22	22
Montanya	Steel Tank	5	42	19
Oak Glen	Steel Tank	0.42	55	23
Oat Hills	Steel Tank	0.45	47	47
Old Castle 1	Steel Tank	0.5	54	19
Old Castle 2	Steel Tank	1.4	35	35
Old Country Club	Steel Tank	0.5	54	23
Paradise 1	Steel Tank	1	51	14
Paradise 2	Steel Tank	2.5	38	11
Pauma Heights	Steel Tank	5	32	32
Red Mt.	Steel Tank	0.3	53	34
Reid Hill	Steel Tank	1	41	13
Reidy Canyon 1	Steel Tank	0.5	64	33
Reidy Canyon 2	Steel Tank	1	53	30
Ridge Ranch Interim	Steel Tank	0.1	28	28
Rincon	Steel Tank	1	52	3
San Gabriel 1	Steel Tank	5	48	26
San Gabriel 2	Steel Tank	1.5	26	26
Turner Lake	Open Reservoir - Dam	520	48	
Tyler	Steel Tank	0.8	53	5
Via Cantamar	Steel Tank	3	20	20
Weaver	Steel Tank	5.1	38	18
West 1	Steel Tank	1	57	10
West 2	Steel Tank	2.4	36	11
West Bear Ridge	Steel Tank	4.3	35	35

Prioritization of Projects

Due to decreased revenues during the drought, there was significant deferral of reservoir R&R projects. Because of this deferral, the method of prioritization needed to respond to current needs is not the method desired over the long term. Both approaches to prioritization will be described below.

Currently, on steel tanks coating failure is occurring which is defined as coating deterioration to the point of exposure of bare steel. Normally, the District wants to avoid this condition through proactive measures. Under present conditions, the District's order of priority is to address: 1) coating failure on the edges of the rafters; 2) coating failure on the flat surfaces of the rafters; 3) failure on the flat plates of the walls or roof. Experience has shown the rafter coatings to be the most critical to maintaining reservoir integrity.

At the point in time that the coating failure scenarios are all addressed, the District is planning to revert to a proactive R&R approach. Prioritization of projects at that time would involve the following considerations or possibly a modified version of the following, based on the institutional knowledge of reservoir rehabilitation gained over the course of time. The weighting of these criteria in making a prioritized list for any given year should be up to the judgement of staff at that time to accommodate potentially different conditions present at that time:

- Coating condition
- Age of the coating
- Criticality of reservoir to the water storage function for the District as a whole
- Criticality of reservoir to the water storage function for the zone(s) served
- Funds Available in a given year for repair/replacement activities
- Availability of District staff to execute the project

Opinion of Probable Cost

Table R-2 lists the opinions of the costs for refurbishing the reservoirs and the expected timeframe in which this will occur. For the steel tank reservoirs, the refurbishment includes recoating the interior and exterior of the tanks. As stated earlier, coating projects have been deferred due to financial constraints imposed on the District by the drought. This fact is likely going to result in the need to replace an unknown number of rafters and earthquake straps. Because of these unknowns, the final costs of the identified upgrade projects are likely to be moderately to significantly higher than the recoating costs. Thus, a 10% contingency for rafter and earthquake strap repair has been included in the estimated cost.

The numbers in column 2020-2025 identify reservoirs that require refurbishment over the next 5 years. This amount is an average expenditure of approximately $1.7 M. Refer to the map located in Appendix A for the location of these reservoirs.

Depreciation

Based on current information, which is still being refined, the total replacement cost new for all reservoirs is estimated at $43 M. Depreciation on reservoir assets over the last 4 years has varied between $0.82 M to $1.4 M. The present CIP plan represents spending at an annual rate of approximately $1.7 M, which essentially matches the annual depreciation.

Table R-2 Summary of Reservoir Recoating Projects

SUMMARY OF RESERVOIR PROJECTS									
PROJ _ID	NAME	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2020-25	FY 2025-30	FY 2031-40
DIRECT FUNDED							0-5 Years	6-10 Years	11-20 Years
R19	Betsworth Forebay 2			$598,000			**$598,000**	**$0**	**$0**
R01	Burnt Mountain		$301,000				**$301,000**	**$0**	**$0**
R20	Circle R Reservoir Paint/Recoat	$200,000					**$200,000**	**$0**	**$0**
R21	Couser Reservoir Paint/Recoat	$745,000					**$745,000**	**$0**	**$0**
R04	Mactan		$413,000				**$413,000**	**$0**	**$0**
R05	McNally					$468,000	**$468,000**	**$0**	**$0**
R25	Meadows No.1		$475,000				**$475,000**	**$0**	**$0**
R32	Meadows No.2				$475,000		**$475,000**	**$0**	**$0**
R41	MJM					$204,530	**$204,530**	**$0**	**$0**
R10	Montanya				$293,000		**$293,000**	**$0**	**$0**
R11	Oak Glen Reservoir Demolition	$150,000					**$150,000**	**$0**	**$0**
R06	Pauma Heights					$737,250	**$737,250**	**$0**	**$0**
R31	Reid Hill		$287,000				**$287,000**	**$0**	**$0**
R30	Reidy Canyon No.2		$293,000				**$293,000**	**$0**	**$0**
R34	San Gabriel No.1			$720,000			**$720,000**	**$0**	**$0**
R35	San Gabriel No.2				$403,000		**$403,000**	**$0**	**$0**
R38	Weaver Reservoir Paint/Recoat	$1,875,000					**$1,875,000**	**$0**	**$0**
R39	West 1						**$0**	**$0**	**$301,000**
R12	Oat Hills						**$0**	**$834,000**	**$0**
R17	Old Country Club						**$0**	**$350,000**	**$204,530**
R28	Red Mountain						**$0**	**$0**	**$199,500**
R33	Rincon						**$0**	**$0**	**$203,139**
R37	Tyler						**$0**	**$0**	**$241,813**
R27	Paradise #2						**$0**	**$480,250**	**$0**
R08	Betsworth						**$0**	**$0**	**$239,436**
R18	Betsworth Forebay 1						**$0**	**$0**	**$221,480**
R02	Cobb						**$0**	**$0**	**$0**
R13	Old Castle No.1						**$0**	**$0**	**$0**
R16	Hauck Mesa						**$0**	**$0**	**$0**
R03	Cool Valley						**$0**	**$0**	**$0**
R15	Country Club, East						**$0**	**$0**	**$0**
R43	Country Club, West						**$0**	**$0**	**$0**
R23	Kornblum						**$0**	**$0**	**$0**
R24	Lilac						**$0**	**$0**	**$0**
R36	Turner Lake						**$0**	**$0**	**$0**
R09	Mizpah						**$0**	**$0**	**$0**
R14	Old Castle No.2						**$0**	**$0**	**$0**
	Reservoir Direct Funded Totals	**$2,970,000**	**$1,769,000**	**$1,318,000**	**$1,171,000**	**$1,409,780**	**$8,637,780**	**$1,664,250**	**$1,610,898**

Pump Stations

Overview

A map presenting the locations of the pump stations with CIP activity is presented in Appendix A. A listing of all the pump stations along with an estimate of the total Replacement Value of each pump station is presented in Table PS-1.

Prioritization of Projects

Two primary criteria are weighed in determining the priority of pump station repair/ replacement projects with a third criterion also considered. In order of importance, these criteria are:

1. Total cost savings that would be realized by the District through the modifications
2. Age of the pump station
3. Operational flexibility to maintain water quality

These criteria are used at the current time in consideration of current conditions at the District such as the fact that: flows have been drastically reduced over recent years; and the District pump stations are generally reliable and in good working order because the full station re-builds have been completed. Should current conditions change, these criteria could be amended to reflect the need to respond to those changes.

Total cost savings, which considers both horsepower and efficiency, take precedence over simple pump efficiency improvement when prioritizing pump station modifications. For example, a relatively small improvement in efficiency at a very large pump station, such as Betsworth, could be a higher priority (greater cost savings) than a larger improvement in efficiency at a smaller pump station, such as Jesmond Dene. If the larger pump station is already optimized, then the improvements at the smaller pump station may be warranted. In either case, the improvements themselves would need to be cost effective with a reasonable payback time in order to be listed in the repair/replacement program.

The age of the pump station relates to maintaining on-going system reliability and viability. Pump station age is used to flag potential issues in terms of needed rehabilitations or replacements but is considered in conjunction with facility condition. In some cases, operations may choose to replace based on age due to past failure rates or even industry standards. In other cases, facility condition or criticality of the pump station to current transmission and distribution requirements may be deemed more important than age alone.

The third criteria, operational flexibility to maintain water quality, has become important as a criterion in ranking projects at pump stations due to the reduced flows experienced over the last several years. In consideration of operational flexibility, projects to automate the pump station by-pass function have been initiated at several pump stations. These projects allow water to be transferred from one zone to another without the need for operators to travel to the site to manually adjust the valves. This can help in maintaining water quality on a day-to-day basis, as well as allowing fast response during emergency situations when quick response times are needed, and manpower may be at a premium.

Currently there is one pump station capital improvement project scheduled for the next5 years, described below

Pala Loma Hydro pneumatic System Replacement

This pump station is a small hydro-pneumatic system that is over 40 years old. It serves 6 homes and has become a maintenance issue. The plan is to replace the pressurized tank, control panel and pumps of this system to provide a reliable installation that will require a significantly reduced number of operator site visits.

Approximate Cost - $450,000

Table PS – 1 Pump Station Replacement Cost

Pump Station	Total Replacement Value
Betsworth	$13,945,000
Bingham Mesa	$288,000
Cantrell Corners	$821,000
Couser	$3,358,000
Hauck Mesa	$1,956,000
Jesmond Dene	$635,000
Lilac	$3,906,000
Lilac - Pala	$967,000
McNally	$1,017,000
Miller	$8,891,000
MJM	$1,151,000
Montanya Booster	$215,000
Oat Hill	$4,359,000
Old Country Club (circle "R" pumps)	$831,000
pala loma hydro total (last cell)	$448,000
Paradise Mtn	$2,639,000
Pfau	$1,422,000
Rainbow	$1,381,000
Red Iron Bark	$603,000
Red Mtn	$1,323,000
Ridge Ranch int.	$682,000
Rincon	$1,388,000
San Gabriel	$1,716,000
Tyler	$786,000
Valley Center	$5,227,000
Via Cantamar	$502,000
West	$975,000
TOTAL	**$61,432,000**

Depreciation

Depreciation of pump station assets over the last 4 years has varied between $0.9 M to $1.3 M. Thus, to maintain the assets into the future the District needs to continue actively setting aside funds to replace the assets and investing in maintenance activities that will prolong the asset's useful life.

Miscellaneous

Pressure Reducing Valve (PRV) Stations

Overview

PRV Stations are small installations located throughout the District. There is an existing Repair/ Replacement Program such that repair is handled under normal maintenance and is not included in CIP work.

Prioritization of Projects

The main concern with respect to PRVs is the replacement of the Valve body which lasts approximately 50 years. Scheduled replacement of valve bodies is a long-term item which would be addressed in a CIP program.

Project Description

Currently, all of the PRV stations have been addressed and no replacements are foreseen in the next 10 years.

Monitoring of these stations would be beneficial. However, power would be required for monitoring, and currently none of the PRV stations have power to its site. As of now, it does not appear that the cost of providing power and monitoring is worth the benefits that would be realized. This status could change if technologies for SCADA, battery power storage, micro-hydroelectric generation or several other factors change.

Cost Estimates

Costs were not developed because no modifications are foreseen in the next 10 years.

SCADA/Controls/Monitoring Systems

Overview

Use of SCADA at the District has expanded dramatically in the past decade. Most major facilities now have at least some aspect of their operation monitored or controlled by SCADA. Renewal of the present SCADA equipment is an on-going investment which may be covered in either the O&M budget or the CIP.

Prioritization of Projects

The priorities for funding SCADA/Control/Monitoring Systems are directly related to the expected benefit of the project to the operation of the water distribution system. Many aspects are weighed in determining project priority including: the criticality of the asset being monitored, the need or benefit of instant information, the need or benefit of having an on-going record of the data, staff time saved from not having to visit the site, etc.

One project that is being considered is monitoring of PRV stations. The investment in actual SCADA equipment for PRV stations is minimal (radio, switch, camera, position indicator, etc.) and are all approximately $100 to $200 a piece. More sophisticated equipment, such as pressure cells and cameras

are more costly. Currently, the cost of providing electrical power to those sites is the major deterrent to these projects. In the future, it is anticipated that solar will become the preferred approach over SDG&E power due to the expense that would be associated with the required electrical meter.

Opinion of Cost

Costs were not developed because no modifications are foreseen in the next 10 years. However, as the cost of providing solar power drops, these projects may become cost effective.

Water Model

The District maintains a hydraulic model of its system and uses this model to identify system deficiencies or, more often, identify upgrade projects that will provide enhanced reliability and service to our customers. The model software is "Innovyze InfoWater".

Due to the reduction in water use over recent years, flow rates are much lower and there are very few capacity issues. The few that have been identified are the result of both modeling efforts and consultation with operations staff. Identified capacity issues are as follows:

Lake Wohlford Rd. between Woods Valley Rd. and Valley Center Rd. – 6-inch pipe

Miller Lane – 4-inch pipe

Lilac Rd. between Hideaway Lake and Betsworth Rd. – 6-inch pipe

Cool Valley Rd. – 6-inch pipe.

SECTION III. ASSET MANAGEMENT

This master plan update serves as one of the starting points in developing the Asset Management Plan. In this master plan update the District is redirecting its focus from that of identifying future expansion projects to a focus on repairing and replacing existing assets. The basis for this change lies in the fact that the District now has facilities that provide capacity far in excess of that being used. Thus, the need to add capacity is not present, while at the same time the need to maintain existing capacity remains.

District staff is in the process of developing an asset management program. A few agencies have such programs in place, but most agencies are either in the early stages of developing a program or do not have a program.

Advantages

The benefits of an Asset Management Program become more apparent when one considers an aging water utility, and the alternative to an asset management plan which is a run-to-failure approach requiring reactive repair/replacement. Using an Asset Management program, conditions of assets are monitored, there are scheduled refurbishments of major equipment/assets to prolong their useful life, and replacement is planned to occur on a scheduled basis prior to failure. Realizing that unscheduled pipe breaks will still occur, this approach at least allows the District to perform refurbishments and replacements on a bid basis during normal business hours, while maintaining water service to its customers. Using a run-to-fail approach all repair/replacements occur on an emergency basis which is very expensive because: there is no bidding of services; the time of day during which construction occurs may significantly add to the cost of labor; and specifically for pipelines dewatering will always be required which not only is an added expense in itself, but also extends the period of time emergency crews are waiting to perform their repairs. Add to this the likelihood that customers will also have

unplanned disruptions of service. By comparison the advantages of an Asset Management program become apparent.

Database

An asset management program relies on a data base of information on district assets including general descriptions, the category of asset, installation date, original cost, and relevant detailed information which varies according to each asset category. For the VCMWD water system general asset categories could include: pipelines, reservoirs, pump stations, and miscellaneous. Some Districts could have additional categories such as: treatment, source of supply, etc. Currently, VCMWD's sole source of supply is SDCWA. The VCMWD Asset Management program also contains links to facility drawings which allows ready access to more detailed information.

Condition Assessment

Asset Management includes some level of condition assessment. As with most agencies, the District levels of assessment varies with the category of asset. For pipelines the District has performed condition assessments as input to determining expected useful lives for pipes made of certain materials. Pipe breakage rates are also useful in determining pipeline useful life. For reservoirs visual inspection and sometimes more detailed coatings analysis is used. For pump stations, pumps, themselves, are reviewed for their overall efficiency. Most other pump station facilities are given visual inspections by operations staff.

Replacement Costs (RCN)

One of the key components in an asset management plan is the replacement cost of facilities. The replacement cost is generally defined as the cost to replace the asset as a new facility in today's dollars, referred to as Replacement Cost New (RCN). At this time the District's RCN of for an asset in most cases is based on the original cost of the asset, as tracked in District financial tables. The original cost is multiplied by a ratio of economic indicators (Engineering News Record Construction Cost Index, or ENR, for Los Angeles): "ENR Current Value" divided by "ENR Value when the asset was placed into service". This is performed for each asset and each asset category. The totals for all District assets represents the total RCN for the District.

Depreciation

Depreciation is discussed in several places in this master plan update. Depreciation represents a theoretical estimate of an asset's rate of deterioration and is calculated using an assumed useful life. Because of a myriad of factors, the actual useful life can significantly vary from location to location. Thus, useful life and its implied rate of deterioration and depreciation is an imperfect estimate based on experience.

Even though useful life estimates have limited accuracy, one still acknowledges the fact that assets deteriorate, will eventually require replacement, and that planning for replacement has distinct advantages, as previously stated. The useful lives used by the District for various assets are presented in Appendix B. Based on on-going District experience with various assets, these useful lives may be updated from time to time to reflect new understanding of District assets.

A straight-line method of depreciation is used by the District. Depreciation is calculated by multiplying the RCN of an asset by the ratio: "asset date in service" divided by "asset useful life".

Replacement Cost New Less Depreciation (RCNLD)

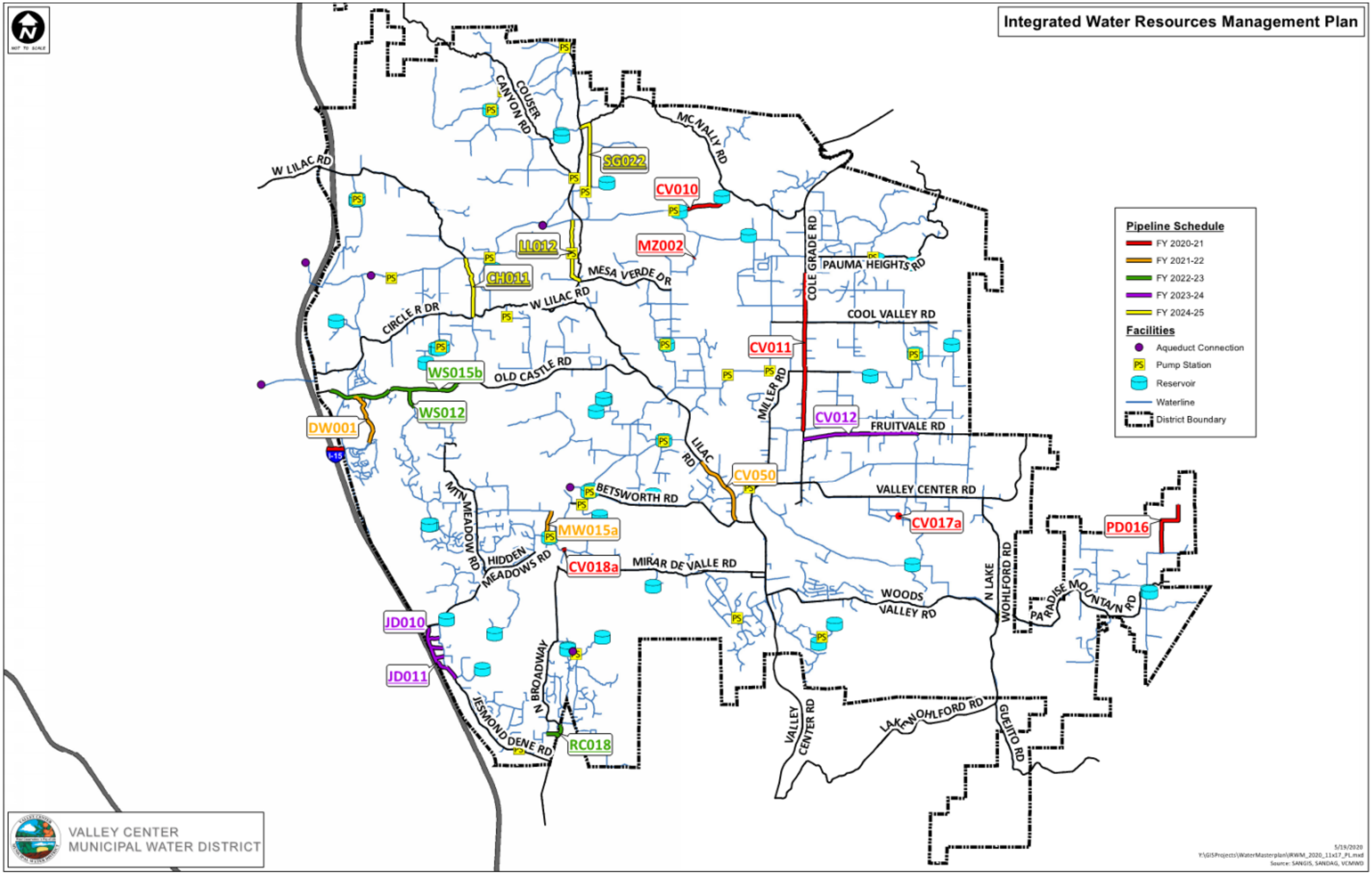
The RCNLD is calculated by subtracting asset depreciation from RCN. The RCNLD is a measure of the remaining value of an asset, and when all asset RCNLDs are added together, is a measure of the current value of the District. RCNLD serves as the basis of the "buy-in" of new customers to the District's water system. Thus, the asset management program provides a tangible, transparent mechanism for developing rates and fees that are tied directly to the assets themselves. In developing this approach creating fees and charges the District has strived to be fair to both existing and new customers. The asset management data base provides the foundation for many of the Districts rates, fees and charges. The Water Capacity Charges and Annexation Fees, for instance, are based in large part on the analyses performed on the asset data base.

Financial Rehabilitation and Replacement Plan

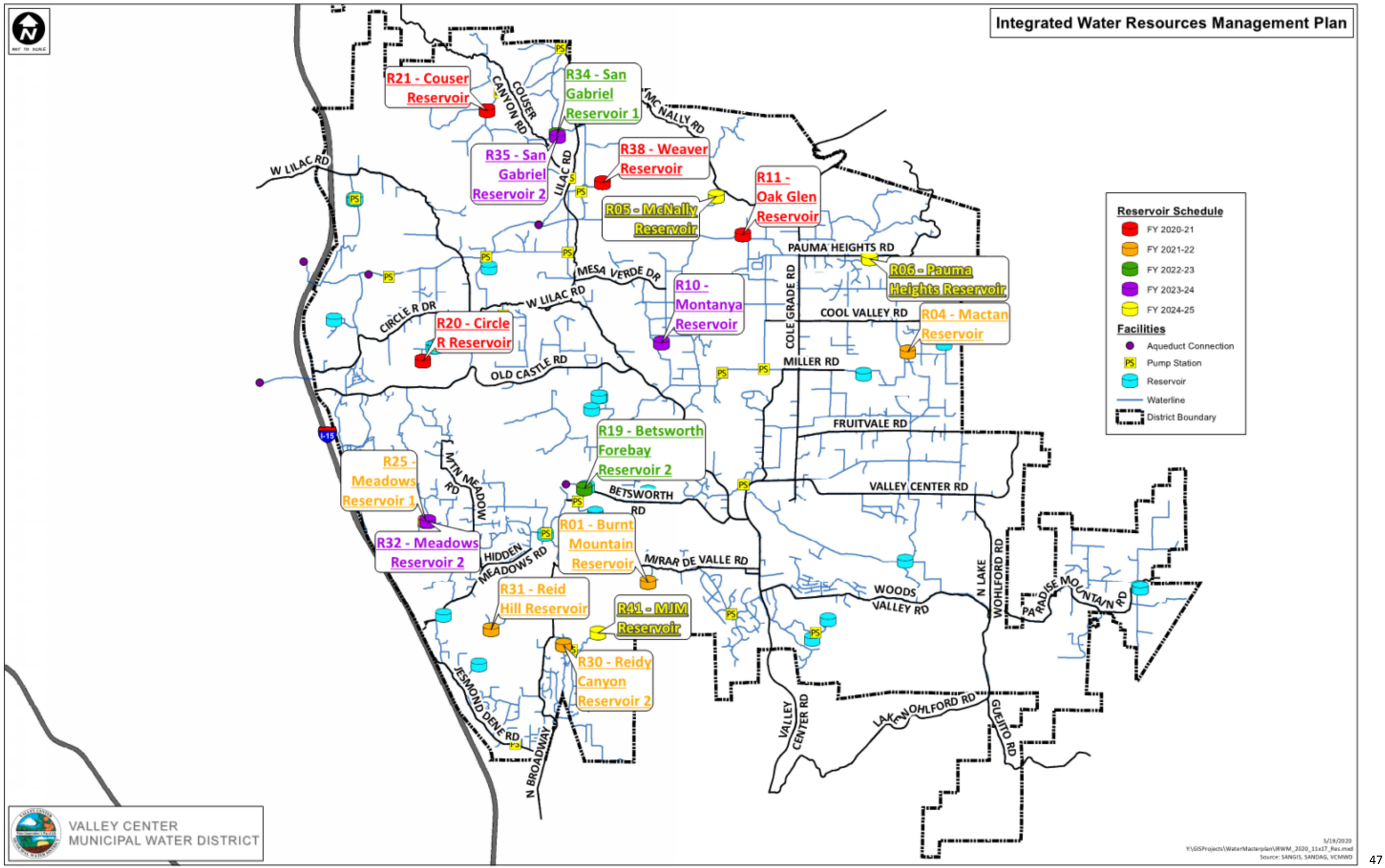
Another function of the Asset Management Program is to facilitate development of a replacement plan to fund assets. By doing a Long Range Financial Strategy, the District will be able to proactively determine: 1) what major projects need to occur to either extend the life of high value assets or replace assets at the end of their useful life; 2) how much those projects will cost; and 3) when the project and funding will be needed. This planning will allow the District to minimize the long term cost of capital and construction costs to the District by: identifying windows of time in which projects can be executed which allows taking advantage of low interest rate funding opportunities when they arise; creating replacement reserve accounts that will serve as collateral to lower bond rates at a time when selling bonds is an attractive option; and minimizing reactive emergency repair projects which are constructed at a premium and disrupt District staff in the execution of planned duties.

When creating replacement reserve accounts agencies normally set aside some percentage of asset value or depreciation. This percentage is totally up to the District's policy makers and normally reflects the District's perspective on planning and maintaining assets. The District currently allocates the property tax and availability charge revenues and the excess pump zone and operating revenues toward funding the replacement of District facilities as they reach the end of their effective service life, approximately 40% of the facilities estimated annual depreciation.

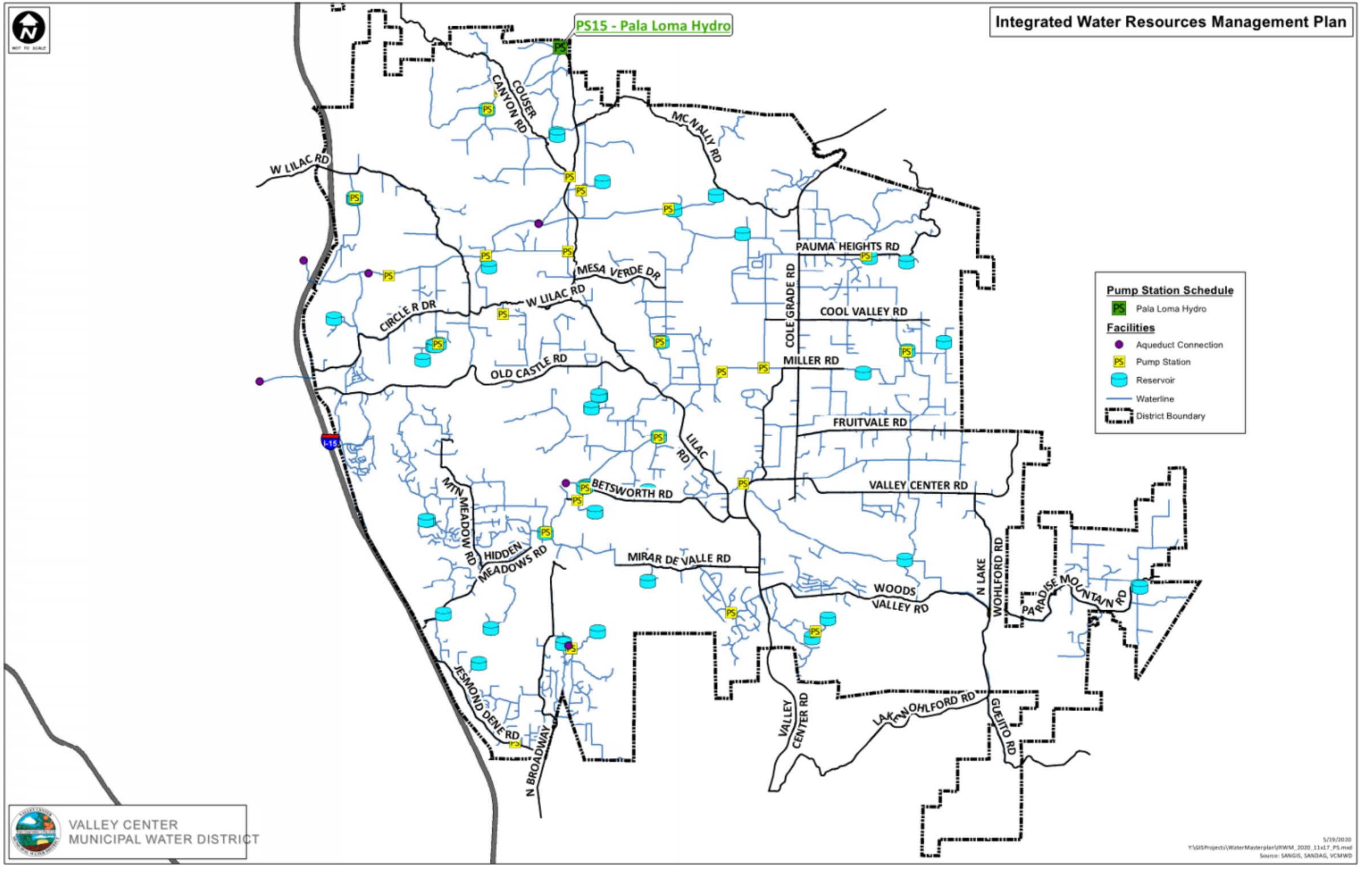
APPENDICES


Integrated Water Resources Management Plan
NOT TO SCALE
Pipeline Schedule
FY 2020-21
FY 2021-22
FY 2022-23
FY 2023-24
FY 2024-25
Facilities
Aqueduct Connection
Pump Station
Reservoir
Waterline
District Boundary
W LILAC RD
COUSER CANYON RD
MC NALLY RD
SG022
CV010
LL012
MZ002
CH011
MESA VERDE DR
CIRCLE R DR
COLE GRADE RD
PAUMA HEIGHTS RD
COOL VALLEY RD
CV011
WS015b
OLD CASTLE RD
MILLER RD
WS012
DW001
CV012
FRUITVALE RD
LILAC RD
CV050
VALLEY CENTER RD
BETSWORTH RD
MTN MEADOW RD
MW015a
CV017a
PD016
HIDDEN MEADOWS RD
CV018a
MIRAR DE VALLE RD
WOODS VALLEY RD
N LAKE WOHLFORD RD
PARADISE MOUNTAIN RD
JD010
JD011
N BROADWAY
JESMOND DENE RD
RC018
VALLEY CENTER MUNICIPAL WATER DISTRICT
5/19/2020
Y:\GISProjects\WaterMasterplan\IRWM_2020_11x17_PL.mxd
Source: SANGIS, SANDAG, VCMWD

Integrated Water Resources Management Plan



Integrated Water Resources Management Plan



Appendix B - Useful Lives

USEFUL SERVICE LIVES	
WATER DESCRIPTION	LIFE (YEARS)
Dam	100
Water Transmission	95
Water Distribution	1
General Structure	50
Concrete Reservoir / Forebay	100
Steel Reservoir	80
Water Pump Station	60
Any Electronic Sensor (AMR)	10
Electrical (General)	40
Mechanical Equipment - Pumps/Engines/Valves	20
Mechanical Equipment (Corrosive Environ)	15
Meter	20
Paint	15
Piping Wastewater/Odor Control	40
Solar Equipment	10
Instrumentation	10
Standby Generator	20
Paving	25
Fencing	20
CMU/Block Walls and Masonry	50
Water Piping at sites (Exposed or Submerged)	50
SCADA and Software	10
Reservoir Floating Cover/Liner	20
Interest on Debt (item 3501)	10
Office Furniture + Trucks + Hvy Equip and Appurt.	10
Admin Cost for creating a "district" - OR Right of Way	100
UWMP Update - every 5 years	5