

RAMONA MUNICIPAL WATER DISTRICT AGENDA MEMO



Agenda Item No. F.1.
Regular Board Meeting of March 10, 2020

Jim Robinson, President
and Members of the Board of Directors
Ramona, CA 92065

RE: DISCUSSION AND POSSIBLE ACTION RELATED TO THE DISTRICT'S UNTREATED WATER SYSTEM

Members of the Board:

Purpose

To review the Untreated Water System Evaluation authorized by the Board in August 2019 and make recommendations for the existing untreated water system.

Background

The Ramona Municipal Water District (District) has a total service area of approximately 75 square miles, located within the eastern mountains of San Diego County, encompassing the Santa Maria and San Vicente Valleys, with elevations ranging between 1,300 and 2,100 feet mean sea level (msl). The potable water supply for the community of Ramona is derived from the San Diego County Water Authority (SDCWA) aqueduct system. The Poway Pump Station, located at an approximate elevation of 775 feet msl, conveys water over 1,000 vertical feet to serve the residents of Ramona.

In addition to imported potable water supplies, the District imports untreated water from the SDCWA, using a second set of pumps located at the Poway Pump Station. Untreated water is pumped from the SDCWA untreated water aqueduct to Lake Ramona. From Lake Ramona, untreated water is again pumped to three additional pumping zones of different elevations. Untreated water is a non-potable, interruptible water source and cannot be used for domestic consumption. Untreated water is used for agricultural purposes and some fire hydrants.

In the early 1980s, as the result of ongoing drought and continued regional growth, the District identified the need to acquire its own untreated water connection to the SDCWA, a treatment plant to treat untreated water to a treated water standard, and a large water reservoir for untreated water storage. The District put the issue to a vote seeking funds to build Lake Ramona, and the measure was approved by the voters by a narrow margin. In 1988, the District completed construction of Lake Ramona to serve as the large reservoir for untreated water storage. Another vote was required to fund the water treatment facility and complete the goals of emergency storage and water treatment. Instead of a second vote, the District chose to connect directly to the SDCWA in the 1990s for treated water.

Construction of Lake Ramona and subsequent litigation resulted in various District obligations. The District is required to continually discharge a specific volume of water from the dam to maintain the wetland habitats below the dam. In addition, the District is required to provide a contract customer untreated water from Lake Ramona. The District must convey water into the dam to accommodate these obligations.

The District incurs various annual regulatory and operational costs associated with Lake Ramona and the 26.5 mile untreated water distribution system. The District's required permitting obligations for DSOD permits are approximately \$70,000, SDCWA capacity fees are approximately \$120,000, labor costs are approximately \$150,000, pumping costs are approximately \$430,000 and evaporation of untreated water from Lake Ramona are approximately \$410,000 annually.

As discussed above, the annual cost to the District relative to the various legal, regulatory and operational obligations of Lake Ramona and the untreated water distribution system can be in excess of \$1,180,000 per year, depending on weather and other factors. All untreated water is purchased from the SDCWA and any untreated water not sold to untreated water customers or evaporated in Lake Ramona are costs that are not recoverable.

Finally, approximately \$42,000,000 in capital investments in pump stations, tanks and pipelines will be required to continue to operate the untreated water system. These costs were not contemplated or included in the Board adopted 2019 Water Facilities Plan or the 2019 Water Rate and Fee update.

Further complicating these challenges, annual use of untreated water within the District has dramatically decreased. In 2019, untreated water sales were approximately 375 acre feet, representing a 91% decline from the high in 2002 of approximately 3,982 acre-feet. The decline in untreated water sales are projected to continue and the costs to continue the operation will continue to increase, therefore it is anticipated that the untreated water system will no longer be economically or operationally viable in the future.

Discussion

To address the ongoing challenges of the untreated water system, the Board of Directors authorized District staff to conduct an Untreated Water System Evaluation (Evaluation). The objective of the Evaluation was to define alternatives to the untreated water system, thereby addressing increasing operational and maintenance costs, increasing untreated water service costs, and long-term District water service considerations. Alternatives identified for evaluation included:

- Conversion of the untreated water system to treated water system
- Conversion of the untreated water system to a recycled water system
- Discontinue untreated water service
- Conversion of the untreated water system to a treated water non-potable system
- Minimize untreated water service and addition of a Woodson Recycled Water Reservoir, thereby maximizing recycled water use
- Do Nothing

The intent of the Evaluation was to study the operational, maintenance and regulatory considerations, and define a preferred implementation plan for the untreated water system. Any required facilities or construction resulting from the Evaluation, if directed by the District Board, may be incorporated into future Water Facilities Plans and rate and fee studies. The current capital requirements for untreated water are not reflected in the rates and fees adopted by the Board in Summer 2019.

District staff has completed the Evaluation and has developed a preferred implementation plan. The implementation plan defines five specific phases for minimizing the untreated water system, maximizing the recycled water system, and maintaining fire hydrant service. Each phase of the implementation plan identifies specific operational and maintenance savings for the District. Based on achievement of the implementation plan, it is projected that the District may realize the following operation and maintenance savings:

Phase 1: Conversion/decommission of the Woodson Untreated Pressure Zone. This phase would eliminate ongoing operation and future maintenance costs for the Green Valley Truck Trail Pump Station. The estimated cost to rehabilitate the Green Valley Pump Station is \$400,000. The annual operational cost savings are projected to be approximately \$38,200. In addition, ongoing maintenance and repair of the pipelines and the pump station in this pressure zone would be eliminated. Customers in this zone will have the option to be converted from untreated water to treated water (and some potentially to recycled water). Treated water and recycled water are appropriate for agricultural uses. Accordingly, the conversion is not expected to materially impact customers.

Phase 2: Converting Woodson Untreated Storage Tank to Recycled Water Use. This action will increase the size of the recycled water system in the Santa Maria Valley, improve the ability of the District to serve recycled water and increase the potential number of recycled water users.

Phase 3: Lower Lake Ramona Water Level Within Permit Levels. Current evaporative losses from Lake Ramona are computed to be approximately \$410,000 per year. Lowering the lake level to decrease the lake's surface area is projected to save the District in excess of \$200,000 per year in evaporative losses.

Phase 4: Continue Review of Other Untreated Water Pressure Zones. Continue to review the untreated water demands and costs in the Snows, Robb, Gillette and Kennedy Untreated Pressure Zones. It is estimated that addressing ongoing operational and maintenance costs for the following facilities would reduce annual operating costs and one time capital costs as follows:

- Snows pressure reducing valve (PRV) and the Chavez PRV - \$2,500
- Snows storage tank rehab - \$285,000
- Robb pump station rehab - \$70,000
- Robb storage tank rehab - \$570,000
- Robb untreated pumping costs - \$ 20,700 annually
- Gillette storage tank rehab - \$285,000
- Gillette untreated pumping costs - \$1,200 annually

- Lake Ramona pump station rehab - \$500,000
- Poway untreated pump station rehab- \$600,000
- Poway untreated pumping costs - \$230,000 annually
- One Kennedy storage tank rehab - \$1,900,000 (both tanks would be \$3,800,000)
- Kennedy untreated pumping costs (from Lake Ramona) - \$141,000 annually

Addressing the operational and maintenance costs of the untreated water system over time could result in annual savings to the District for these remaining untreated zones of approximately \$392,900 per year and one time cost avoidance of \$4,212,500. In addition, the District could avoid approximately \$35,000,000 in pipeline replacement/rehabilitation costs for the 26.5 mile untreated water distribution system. The present worth of these cost savings is approximately \$40,800,000 over a ten-year period at 3% interest. The District would be required to continue to pay \$120,000 for the SDCWA untreated water turnout and \$70,000 in state dam permitting fees per year.

Phase 5: Lake Ramona. Lake Ramona requires extensive review prior to identifying viable options. Therefore, there is no identified actions or cost savings for Phase 5 at this time, outside of roughly \$169,000 in annual pumping costs should a reduction in pumping to Lake Ramona be warranted.

Next Steps

If the Board implements Phases 1 through 3 the next steps would include:

1. Send letters to customers in the Woodson Pressure Zone notifying them that untreated water service will no longer be available in their area after July 1, 2021.
2. At the customers' request, the District will work with individual customers to identify their specific options including disconnection from the untreated system and/or conversion to treated or recycled water systems. The General Manager has the authority to review, on a case by case basis, and waive any fees related to abandonment of the untreated water connections for the customers impacted by the untreated water system decommissioning. Customers must still pay for any costs related to purchasing additional capacity into the treated water system or recycled water system.
3. Prior to decommissioning the Woodson Pressure Zone staff will provide the Board with a status update including additional recommendations, any potential customer initiatives or a workshop if there is customer interest.

Fiscal Impact

The Evaluation was completed within the previously identified budget of \$50,000.

Recommendation

District staff respectfully recommends the Board accept the Untreated Water System Evaluation and authorize the General Manager to implement Phases 1 through 3 of the defined implementation plan.

Prepared by: D. Michael Metts, PE, District Engineer

Submitted by: David Barnum, General Manager

ATTACHMENTS:

Attachment 1 Untreated Water System Evaluation

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Untreated Water System Evaluation

Prepared for:



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January 2020

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1 Introduction

The Ramona Municipal Water District is a public agency organized under the Municipal Water District Law of 1911, Water Code Section 71000. The mission of the District is to provide a safe and reliable supply of water to its customers within the District Service Area of San Diego County. The District’s 2015 Urban Water Management Plan (UWMP) identifies an array of water resources projected to ensure long-term water supply reliability for the District. The District is a member agency of the San Diego County Water Authority (CWA), which is in turn a member agency of the Metropolitan Water District of Southern California (MWD). The District relies on MWD and CWA to continue to provide a reliable supply of treated and untreated water for its customers.

The Ramona Irrigation District (RID) was formed in 1925, encompassing a service area of approximately 660 acres. The RID relied exclusively on local wells for its water supply. In 1956, the Ramona Municipal Water District (District) was formed, encompassing approximately 20,600 acres surrounding the RID, acquiring the RID in 1967. Over several years, the District constructed an array of facilities to convey CWA water to service District customers, including the Poway Pump Station (1958) and the Barger Water Treatment Plant (1972). In approximately 1979, the District organized Assessment District 79-1 to construct the Untreated Water Pump Station and 27-inch pipeline which allowed the District to provide untreated water to agricultural customers located in the western portion of the service area primarily consisting of avocado groves. With a capacity of 13,400 acre-foot, Lake Ramona was constructed in 1988 to supplement the District’s untreated water supply, as well as provide a raw water supply for a potential potable water treatment plant. In 1998, the District paid CWA to construct the Ramona 3 Pipeline to provide treated water to the Ramona community.

1.1 Purpose

Since its inception, the District’s untreated water system has been a point of discussion between the District and the community. Lake Ramona was originally designed to include a subsequent water treatment plant, which was never constructed. Construction of the Ramona Dam and Lake displaced natural stream flow to the downstream Blue Sky Preserve. Negotiated local accommodations and agreements allowed Lake Ramona to be constructed, representing a component of the existing Untreated Water System.

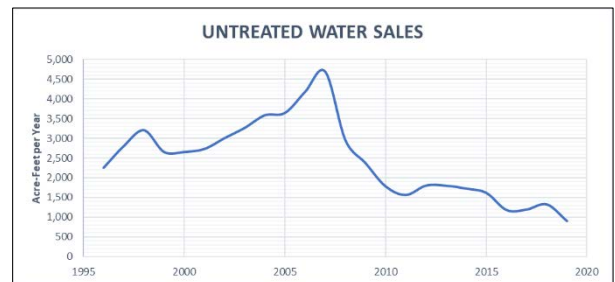


Figure 1 - Annual Untreated Water Sales

Since the 2009 economic downturn, agricultural water demand has substantially decreased. **Figure 1 - Annual Untreated Water Sales** shows the decrease in untreated water sales over the past 23 years. As untreated water demand has decreased, the cost of untreated water from CWA has steadily increased.

In addition, operating expenses of the untreated water system and Lake Ramona have continued to increase. Annual costs for the untreated water system include approximately \$120,000 for CWA capacity fees, approximately \$410,000 in evaporation losses from Ramona Lake, Ramona Dam permitting cost of approximately \$70,000, and contract customer water costs of approximately \$350,000. These costs, totaling approximately \$950,000 per year, are in addition to the increasing costs of untreated water purchased from the CWA.

The purpose of this study, recognizing the increasing cost of untreated water service, is to evaluate District options relative to its untreated water system and identify viable alternatives for reducing District costs.

2 Existing Untreated Water System

To effectively evaluate long-term alternatives for the untreated water system, it is necessary to fully understand the system components, capacities and limitations. The following discussions define the system geometry, water demand and constraints of the existing untreated water system, as well as operational and regulatory requirements.

2.1 System Configuration

In 1979, Assessment District 79-1 (AD) was created to finance an untreated water delivery system in the Highland Valley area, covering approximately 6,000 acres in the westerly portion of the District service area. All infrastructure funded with AD 79-1 was built, and all of the financing bonds issued pursuant to AD 79-1 were subsequently repaid. At that time, the District maintained a turnout (Ramona #1) on the CWA San Diego Aqueduct (SDA). The SDA turnout had an original capacity of 8.0 mgd, and was inactive. The District was supplied treated water from Poway Treatment Plant. The treated water was conveyed to the District's Poway Pump Station and subsequently pumped to the Woodson and Gillette Reservoirs.

The water served domestic and irrigation demands within the AD through a limited distribution system, as well as supplementing water supply to the remainder of the District service area. Under agreement, which expired in 1984, the District was supplied 12.0 mgd or more when water was available from the Poway treatment plant. However, due to increasing demand in Poway, the Agreement was not renewed, and the District lost this supply after 1984. At that time, the District planned to build a 12,000 acre-foot untreated water reservoir, Lake Ramona, and a treatment plant to service treated water demand after 1984. Lake Ramona was built, but the treatment plant was never constructed at Lake Ramona.

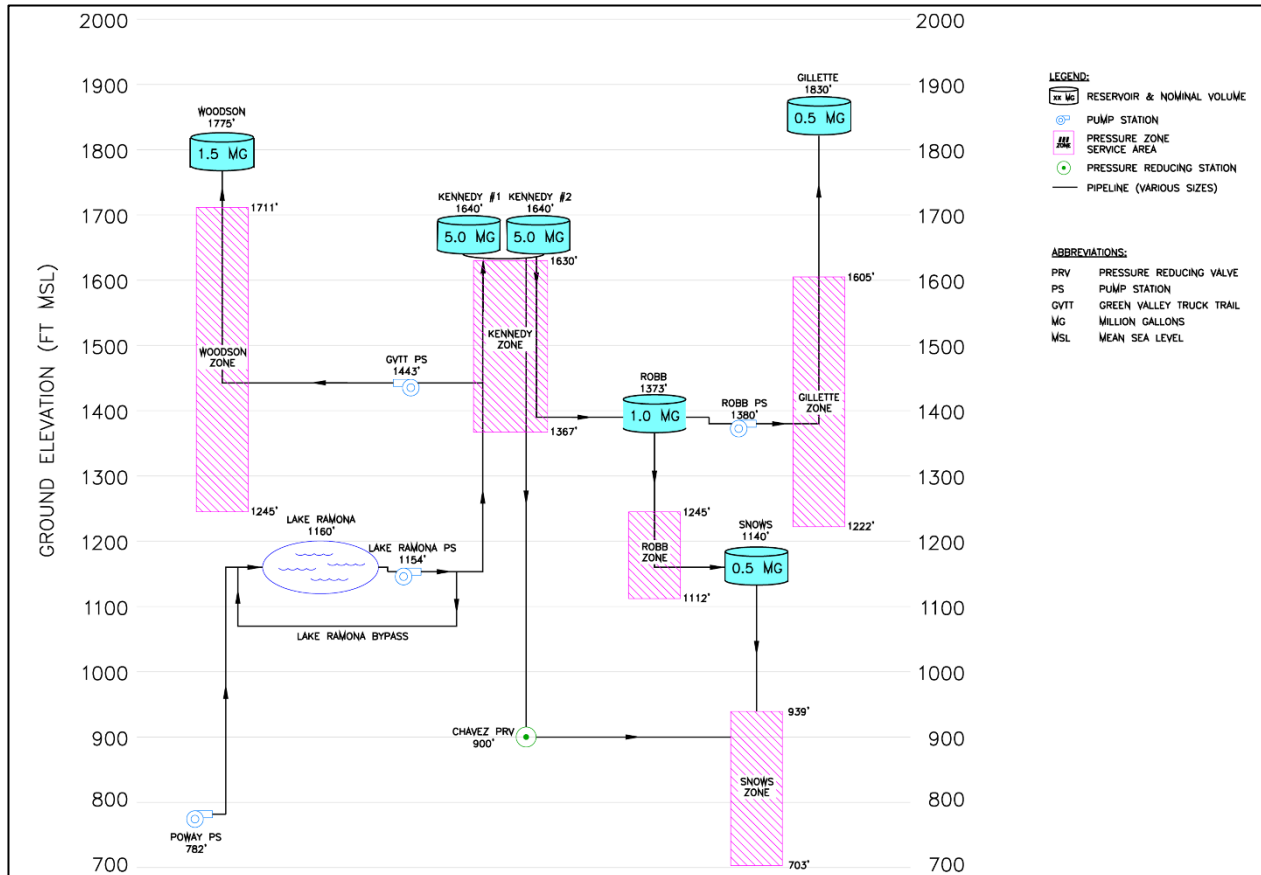
Water is tributary to the untreated water system by way of the District turnout (Ramona #1) and the Poway Untreated Pump Station. The Ramona Lake Pump Station (RLPS) pumps untreated water from the 27-inch pipe, between the Poway Untreated Pump Station and Lake Ramona, into the untreated water system. The system is divided into multiple pressure zones, as dictated by the elevations of existing reservoirs.

- **Kennedy (1,670-foot) Pressure Zone.** This pressure zone is served by the RLPS, located near Lake Ramona Dam on Green Valley Truck Trail. The pressure zone is served by two (2) identical 5.0-MG steel tanks, located at Eagles Crest Road and Falcon Heights Road. The pressure zone has an average annual demand of 75 acre-feet.
- **Woodson (1,800-foot) Pressure Zone.** This pressure zone is served by the Green Valley Track Trail (GVTT) pump station. The GVTT pump station pumps water from the 20-inch Kennedy pressure zone pipeline, along Green Valley Truck Trail. The 1.5-MG Woodson Tank, located at the west end of Woodson Drive, serves the pressure zone. The pressure zone has an average annual demand of 267 acre-feet.
- **Gillette (1,870-foot) Pressure Zone.** This pressure zone is served by the Robb pump station (PS), located adjacent to the Robb storage tank. Robb pump station pumps water from the Robb Tank to the 0.5-MG Gillette Storage tank, located on Starvation Mountain Road. The pressure zone has an average annual demand of 87 acre-feet.
- **Robb (1,400-foot) Pressure Zone.** This pressure zone is served by the 1-MG Robb tank, located on Highland Valley Road. The Robb tank is served by the Kennedy pressure zone. The pressure zone has an average annual demand of 220 acre-feet.

- **Snows (1,160-foot) Pressure Zone.** This pressure zone is primarily served by the 0.5-MG Snows tank, located on Highland Valley Road. The Snow tank is feed by the Robb pressure zone. Secondary inflow to the Snows pressure zone is tributary from the Kennedy zone, through the Chavez Untreated pressure reducing station (PRS). The pressure zone has an average annual demand of 178 acre-feet.

Figure 2 provides a schematic illustration of the untreated water system, showing the relative elevations of the various system components and the conveyance of water within the system.

Figure 2 – Untreated Water System Schematic



The current Untreated Water System is comprised of approximately 139,900 linear feet of pipeline, ranging between 4 and 27 inches in diameter. The untreated system has four pump stations, six water storage tanks, and two pressure-reducing stations. **Figure 3** illustrates the geometry of the untreated water system. **Table 1** summarizes the pipeline lengths by size. **Table 2** identifies the existing water tanks and their corresponding volumes. Lake Ramona stores large volumes of untreated water, which is subsequently pumped into the untreated water distribution system.

Table 2: Untreated Storage Tank Operating Data

<i>Storage Tanks</i>	<i>Capacity</i>	<i>Elevation</i>	<i>Pumps On</i>	<i>Pumps Off</i>	<i>Oper. Vol</i>	<i>24-hr Vol</i>	<i>GPM</i>
<i>Gillette Untreated</i>	<i>0.52 MG</i>	<i>1,830 Ft</i>	<i>30 ft</i>	<i>35 ft</i>	<i>5.0 ft</i>	<i>69,333</i>	<i>48</i>
<i>Kennedy Tank East</i>	<i>5.0 MG</i>	<i>1,640 Ft</i>	<i>24 ft</i>	<i>29 ft</i>	<i>5.0 ft</i>	<i>310,787</i>	<i>216</i>
<i>Kennedy Tank West</i>	<i>5.0 MG</i>	<i>1,640 Ft</i>	<i>24 ft</i>	<i>29 ft</i>	<i>5.0 ft</i>	<i>310,787</i>	<i>216</i>
<i>Robb Tank</i>	<i>0.99 MG</i>	<i>1,373 Ft</i>	<i>26 ft</i>	<i>27.5 ft</i>	<i>1.5 ft</i>	<i>270,060</i>	<i>188</i>
<i>Snow Untreated</i>	<i>0.50 MG</i>	<i>1,140 Ft</i>	<i>22 ft</i>	<i>24 ft</i>	<i>2.0 ft</i>	<i>164,640</i>	<i>114</i>
<i>Woodson Tank</i>	<i>1.48 MG</i>	<i>1,775 Ft</i>	<i>15 ft</i>	<i>20 ft</i>	<i>5.0 ft</i>	<i>294,400</i>	<i>204</i>

Pump on and off are the operational control levels for the untreated water pump stations

Untreated water from the CWA aqueduct, located in the City of Poway along Espola Road, is conveyed to the Poway Untreated Pump Station (PUPS) through an 18-inch pipeline. The PUPS has two 800-horsepower (Hp) electric vertical turbine pumps. These pumps were originally designed to convey water to the Kennedy tanks, from which the water was distributed throughout the distribution system. In recent years, the pumps have been rehabilitated to pump to Lake Ramona. Therefore, without additional rehabilitation, the PUPS is incapable of supplying untreated water to the distribution system directly.

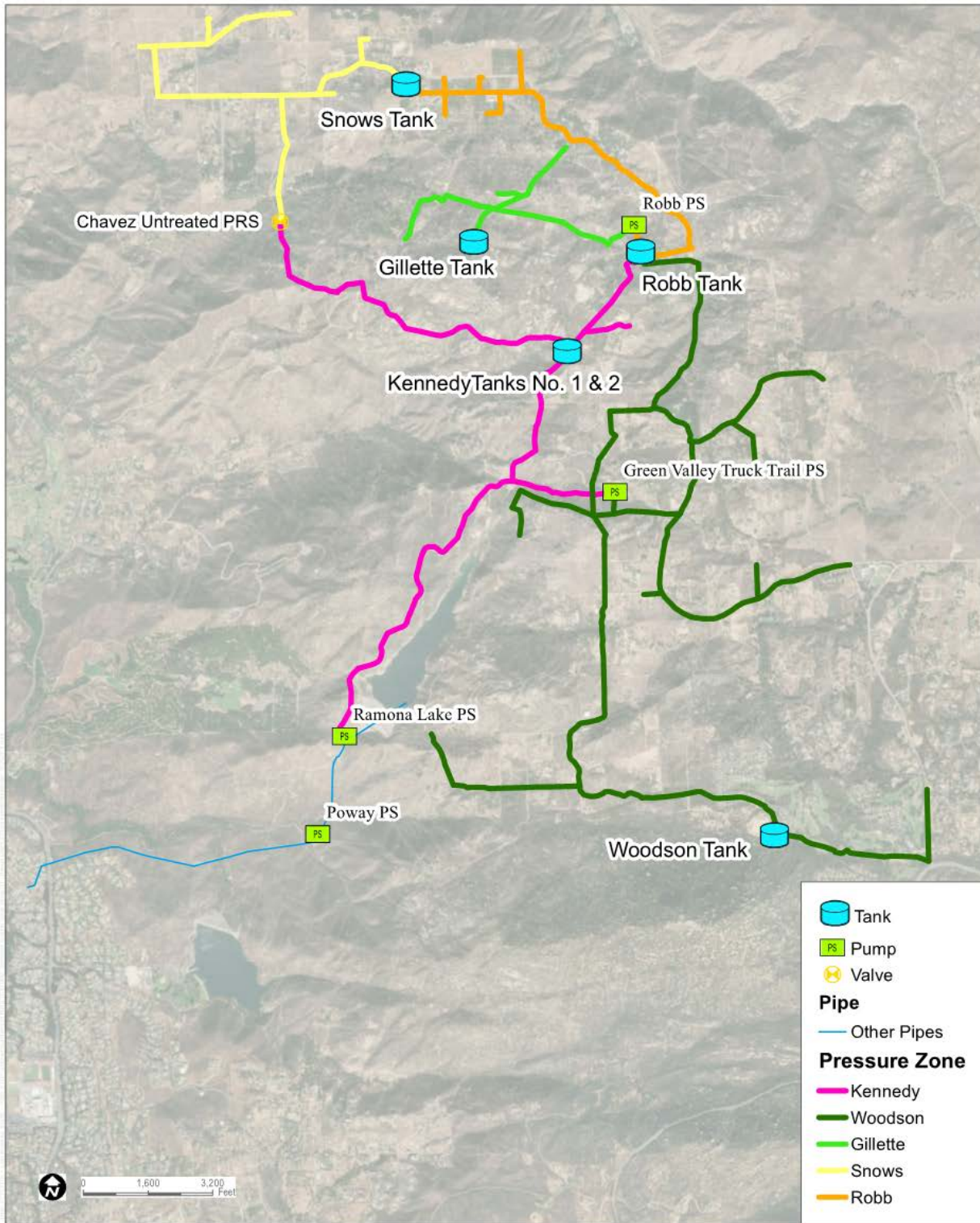
The untreated water system parallels the existing potable water distribution system. As such, local fire protection is provided by both systems. A large portion of the fire protection within the untreated service area is provided by the untreated water system.

Table 1: Untreated Pipeline Summary

Pipe Diameter (inch)	Length of Pipe (ft)	Percent of Total Length
4	615	0%
6	8,568	6%
8	32,133	23%
10	13,573	10%
12	29,265	21%
14	12,125	9%
16	4,340	3%
18	20,533	15%
20	2,130	2%
27	16,602	12%
Total	139,884	100%

Data Source: 10/28/2019 Untreated Water Model

Figure 3 – Untreated Water Distribution System



SOURCE:



Untreated Water Distribution System
Ramona Municipal Water District

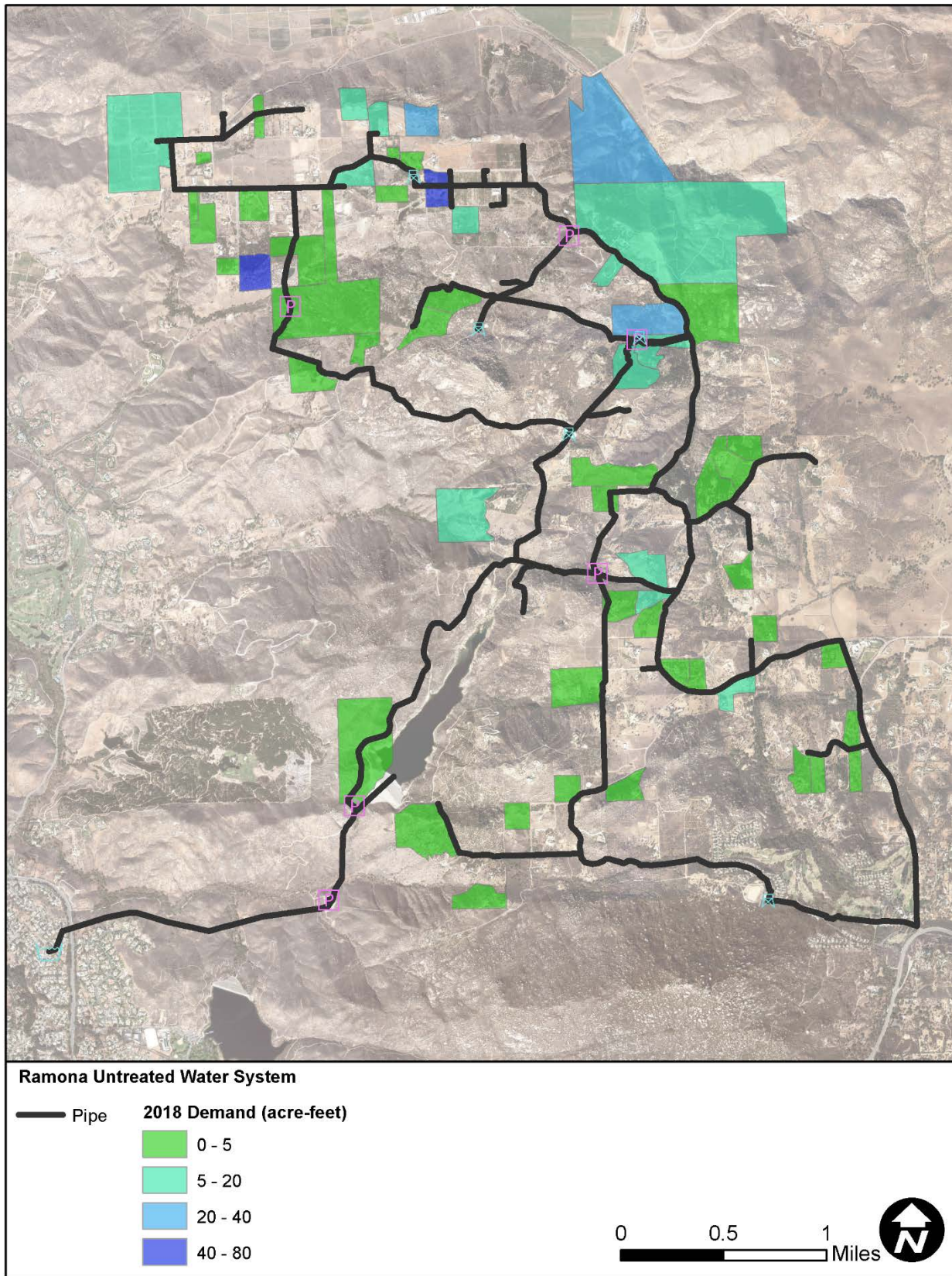
A hydraulic simulation was prepared for the existing untreated water system, to evaluate the existing system operational characteristics. The hydraulic simulation integrates the geometry of the untreated water distribution system and the untreated water demand. Untreated water demand is developed from existing untreated meter records, contained in the District billing system. **Figure 4** illustrates the relationship of 2018 untreated water customers and the untreated water distribution system. **Table 3** summarizes the untreated water demand by pressure zone, including the number of customers and the highest single demand within each pressure zone.

Table 3: Untreated Demand by Pressure Zone

Pressure Zone	Active Meters	Inactive Meters	Total Meters	Maximum Demand (afy)	Median Demand (afy)	Minimum Demand (afy)
Kennedy	11	9	20	27.33	2.18	0.03
Robb	16	3	19	43.90	6.31	0.04
Snows	38	6	44	52.65	1.10	0.03
Gillette	16	9	25	22.85	2.20	0.02
Woodson	57	30	87	12.40	0.71	0.00
	138 <i>(71.5%)</i>	57 <i>(29.5%)</i>	195 <i>(100%)</i>	52.65	1.62	0.00

Based on analysis of the hydraulic simulation, the existing untreated water system exhibits no hydraulic deficiencies under maximum day demand conditions. This result is not surprising, as the distribution system has efficiently satisfied significantly greater demand in past years. Reservoir, pump station and pressure reducing stations operate efficiently to meet the identified 2018 untreated water demand.

Figure 4 – Untreated Water Demand Distribution



Based on local fire codes, the portions of the District served by the untreated water system are required to provide 1,500 gallons per minute (gpm) under fire conditions. The untreated water system currently supplies the majority of fire protection water west of Highland Valley Road. If the untreated water system were discontinued, the existing potable water system would be required to meet the current fire protection standard. **Figure 5** identifies locations where the existing untreated water system is incapable of meeting the required fire flow. Similarly, **Figure 6** identifies locations where the existing potable water system does not meet the required fire flow. As illustrated by the two figures, the untreated and potable water systems have similar deficiencies with regard to fire flow. Thus, the District can transfer fire flow service from the untreated to the treated water system. Replacement pipelines in the potable water system, similar to that needed for the untreated system, will be required to meet the 1,500-gpm fire flow. It is noted that other potable water system replacements are discussed in Section 3 regarding potential untreated water system alternatives.

Figure 5 – Untreated Water Fire Flow Analysis

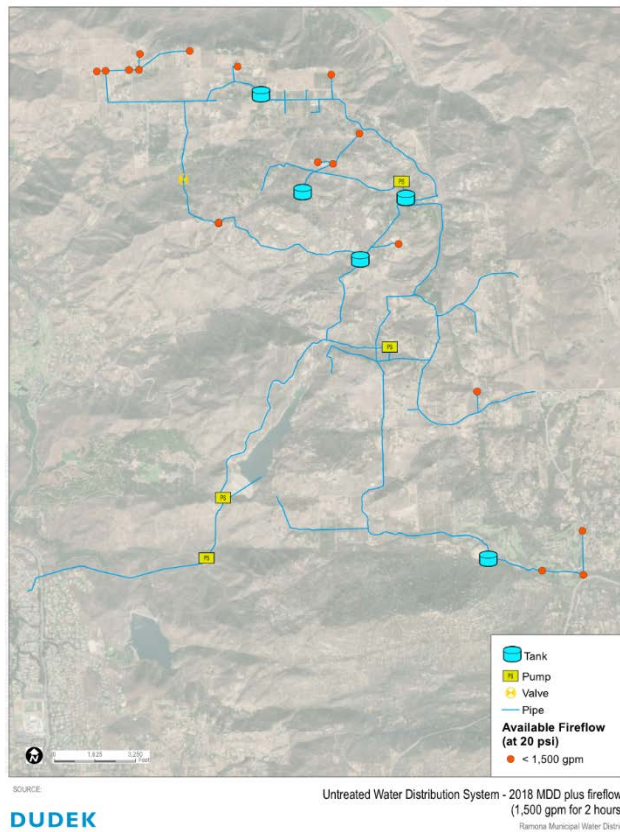
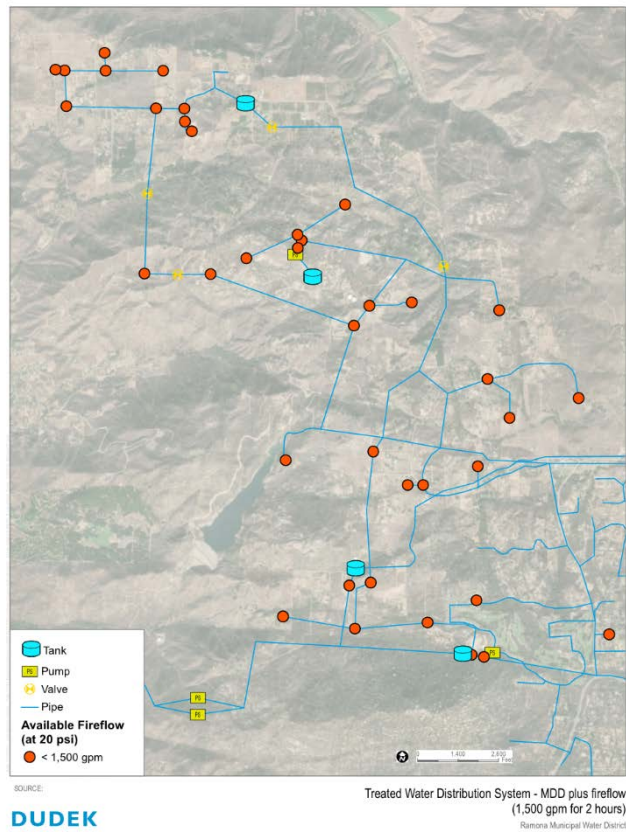


Figure 6 – Treated Water Fire Flow Analysis



2.2 Untreated Water Pumping

As discussed in Section 2.1, the untreated water system conveys water from the CWA raw water aqueduct into Lake Ramona, and ultimately into the various storage tanks within each untreated water pressure zone. The cost associated with conveying the water is in addition to the CWA water purchase rate. These facilities, including the pumping and storage infrastructure, represent an annual operation and maintenance cost to the District. As such, reducing or eliminating the untreated water system will affect the District’s annual expenses. While the cost of operating storage reservoirs is very small (gravity facilities), the annual cost of water pumping is more significant.

The District imports both treated and untreated water from the CWA. CWA water is tributary to the Ramona system from the CWA aqueduct, located west of Espola Road in Poway. Water is conveyed through the Poway Pump Station, at an approximate elevation of 718 feet above mean seas level (msl). Untreated water is pumped to Lake Ramona (approximately 1,150 feet msl), serving approximately 6,200 acres of agricultural lands in the Highland Valley area through various reservoirs with the highest in elevation being over 1,800 feet msl (Gillette Reservoir). Treated water is conveyed to the Mt. Woodson Reservoir (1,800 feet msl) and West End Tank (1,700 feet msl), subsequently to Ramona treated-water customers. Both the treated and untreated water systems rely on several booster pump stations throughout each system to deliver water to higher elevations.

The District conducted a comprehensive rate and fee update in 2019. From that process, the Board adopted rate and fee adjustments for various District services, including water rates and fees, which included a uniform pumping rate for all customers using either treated or untreated water. Updated rates were adopted for Fiscal Year (FY) 2019/20, and the following FY's through FY23/24. Ordinance 19-454 includes provisions to allow pass through of cost increases for future increases in water supply and energy costs.

The revenue required to support pumping in each system is based upon the premise that the utility must generate annual revenues to meet supply, O&M expenses, any debt service needs, reserve levels, and capital investment needs. Deductions are made to account for revenue offsets, required net cash flow, and any mid-year adjustments. The cost of service distributes a utility's revenue requirements to each customer class. After determining the revenue requirement, the total cost of service is evaluated by system function to proportionately distribute cost in relation to how the cost is generally incurred. The pumping / energy component recovers energy and related costs associated with pumping water into and throughout the District systems. Pumping / energy costs were previously divided equally over all units of water service. As a result of recent evaluations, Pumping/energy costs are proposed to be allocated as either treated, untreated, or an appropriate split between the two systems. The pumping / energy revenue requirement of \$1,922,800 for FY2020, which is allocated based on the pumping realities in each system; \$1,495,450 to treated water and \$402,322* to untreated water. The analysis outcome are recommendations for FY 2020 Pumping / Energy Rates of \$0.92 per billing unit and \$1.23 per billing unit for the treated and untreated systems, respectively (Table 4). The revenue requirements noted, and projected water usage for treated and untreated customers, both match the figures in the 2019 Rate and Fee Analysis and Recommendations prepared by Raftelis Financial Consultants (RFC). RFC also independently reviewed the District methodology, calculations, and proposed rates for pumping costs and confirms its analysis and findings.

Table 4 – Energy Component – Unit Rate by System

Customer Class	Projected Usage (ccf)	% Allocation	Revenue Requirements	Unit Rate (\$/ccf)
Treated	1,631,421	83%	\$1,495,450	\$0.92
Untreated*	327,092	17%	\$402,322	\$1.23
Total*	1,958,513		\$1,922,800	

*The total revenue requirements noted above in Table 1-2 for untreated costs is \$427,350; however, the District receives a small amount of revenue from untreated pumping charges paid by Contract Customers which is projected to be \$25,028 for FY19/20. Therefore, this total should be applied as an expected revenue to offset a like amount of costs for the untreated pumping cost. This new revenue requirement total for the untreated pumping costs for FY19/20 is \$402,322.

As shown in **Table 4**, the untreated water system exhibits a higher per unit rate, primarily as a result of the extremely low water use from that system. As the demand for untreated water continues to decrease, the cost associated with untreated water pumping will likely continue to increase on a per unit basis.

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3 Untreated Water System Alternatives

Considering ongoing increases in untreated water cost and increasing operational costs of the untreated water system, this report identifies alternatives for the District to evaluate and determine whether or not the District could lower annual untreated water costs. These alternatives include the following:

- Convert the Untreated Water System to a Potable Water System
- Convert the Untreated Water System to a Recycled Water System
- Eliminate the Untreated Water System and Discontinue Untreated Water Sales
- Convert the Untreated Water System to a Treated Non-Potable Water System
- Minimize Untreated Water System Service
- Ramona Lake Alternatives
- No Project Alternative

The following discussions expand on these alternatives, defining the advantages and disadvantages of each relative to the District's long-term water service objectives.

3.1 Convert Untreated System to Potable System

Conversion of the existing untreated water system to convey potable water seemingly provides significant advantages to the District. Particularly, the existing untreated water pipelines are larger than the corresponding potable water pipelines. As such, conversion to potable water use would significantly increase the conveyance capacity of the existing potable water system.

Conversion of the untreated facilities for potable water use would require complete disinfection of all untreated water facilities before being safe to use for potable water conveyance. As the untreated water system has been in operation since 1979, disinfection of all untreated facilities, if attainable, would require many years of treatment and testing. In addition, the District would require approval of the San Diego County Department of Environmental Health (DEH). Depending on the internal condition of the untreated system, disinfecting and documenting a single pipeline could require significant time and cost. Furthermore, large portions of the untreated water system would be taken out of service, as connecting pipelines are disinfected. Existing untreated customers would either lose water service or be required to acquire a new meter connection to the potable water system.

Qualitatively, conversion of the entire untreated system to potable water use is highly speculative and expensive, if not impractical to attain. As a result, this alternative is eliminated as a viable method of controlling increasing untreated water costs.

3.2 Convert Untreated System to Recycled Water System

Conversion of the entire untreated water system to recycled water would reduce the need to purchase untreated water from CWA, and provide increased effluent disposal without spray fields. Unfortunately, the existing tertiary treatment plant, located on Rangeland Road, has a maximum capacity of 325,000 gallons per day (gpd). Of this available capacity, the Mount Woodson Golf Course has a maximum annual demand of approximately 225,000 gpd. Recycled water sales records show that Mount Woodson varies its demand seasonally, taking the entire plant production in the summer months and very little or no production in the winter months. When demand exceeds the plant capacity, untreated water is provided to supplement the recycled water supply. Therefore, significant volumes of recycled water are not available to serve the untreated customers.

Conversion of the untreated water system to recycled water requires regulatory considerations as well. All recycled water customers are required to obtain a recycled water use permit from DEH and the District. All customers connected to the untreated water system would be required to meet these regulatory requirements, even if only a very small portion of the water supply is recycled water. Operation of the recycled water system required annual inspections by District staff, as well as certified on-site supervisors, avoidance of water run-off, and other requirements that make system conversion impractical.

Conversion of a small portion of the existing untreated system to recycled water would provide the District with significant benefit. As Mount Woodson is already seasonally using the majority of recycled water production, the District can convert the Woodson untreated tank and the untreated pipelines along South Woodson Drive and Archie Moore Road for recycled water use. These facilities would provide the recycled water system with an elevated tank to maintain pressure in the recycled water system. This tank would allow the tertiary treatment plant to operate more efficiently, as compared to the start and stop operation currently employed. Four to five existing untreated customers could be converted to recycled water use, requiring those few customers to meet DEH and District permitting requirements. During times of high demand, the recycled water system can be supplemented with potable water from the Woodson Potable Reservoir. Four of the five existing untreated customers are already receiving potable water because the District lacks untreated water facilities to properly serve these demands.

Complete conversion of the untreated water system is not feasible. However, conversion of a small portion of the Woodson pressure zone is feasible and would be beneficial to the District.

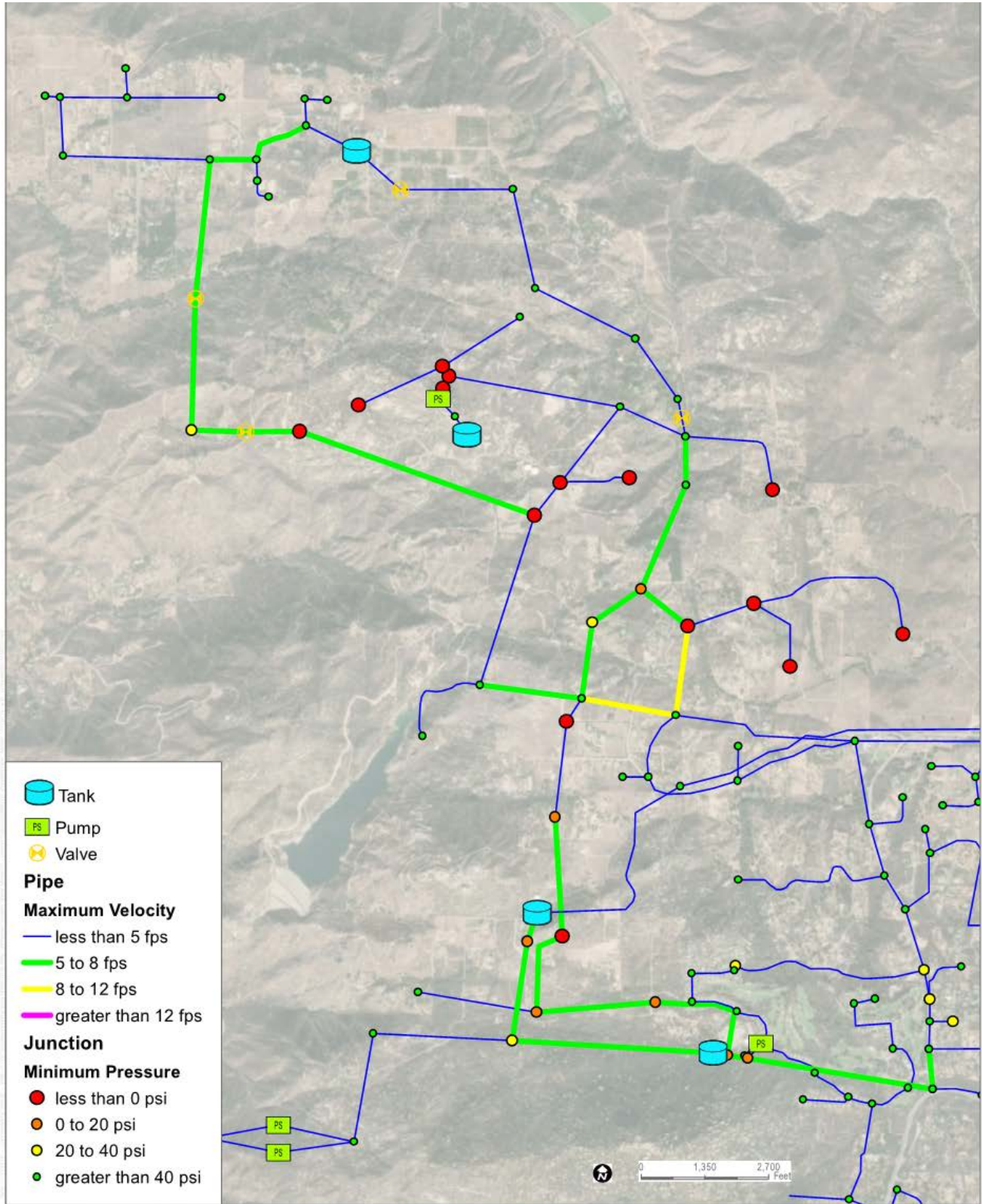
3.3 Discontinue Untreated Water Service

Discontinuing untreated water service would require all existing demands to be transferred to the existing potable water system. Untreated water demands in 2018 total approximately 1,127 afy, with approximately 300 afy supplied directly from Lake Ramona. Therefore, approximately 827 afy of untreated demand would be transferred to the potable water system.

As discussed previously, it has been shown that transferring fire flows from the untreated system to the potable system essentially provide the same fire flow capability as is currently available to the subject area. Replacement pipelines will be needed to remedy the deficiencies as discussed above and illustrated in **Figures 5** and **6**. Similarly, transfer of the entire untreated water demand to the potable water system results in conveyance system deficiencies that will require pipeline replacements. **Figure 7** illustrates the pipeline deficiencies projected when all untreated water demands are transferred to the potable water system. The smaller pipelines within the potable Woodson pressure zone (between 6- and 8-inch in diameter) limit the ability to convey water to the northern portions of that zone, resulting in high pipeline velocities and insufficient delivery pressures. As shown in **Figure 8**, replacement of the undersized 6- and 8-inch pipelines with 12- and 16-inch pipelines mitigates the system deficiencies. As conversion of untreated demand to the potable water system should be completed systematically, replacement of the required pipelines can also be scheduled appropriately.

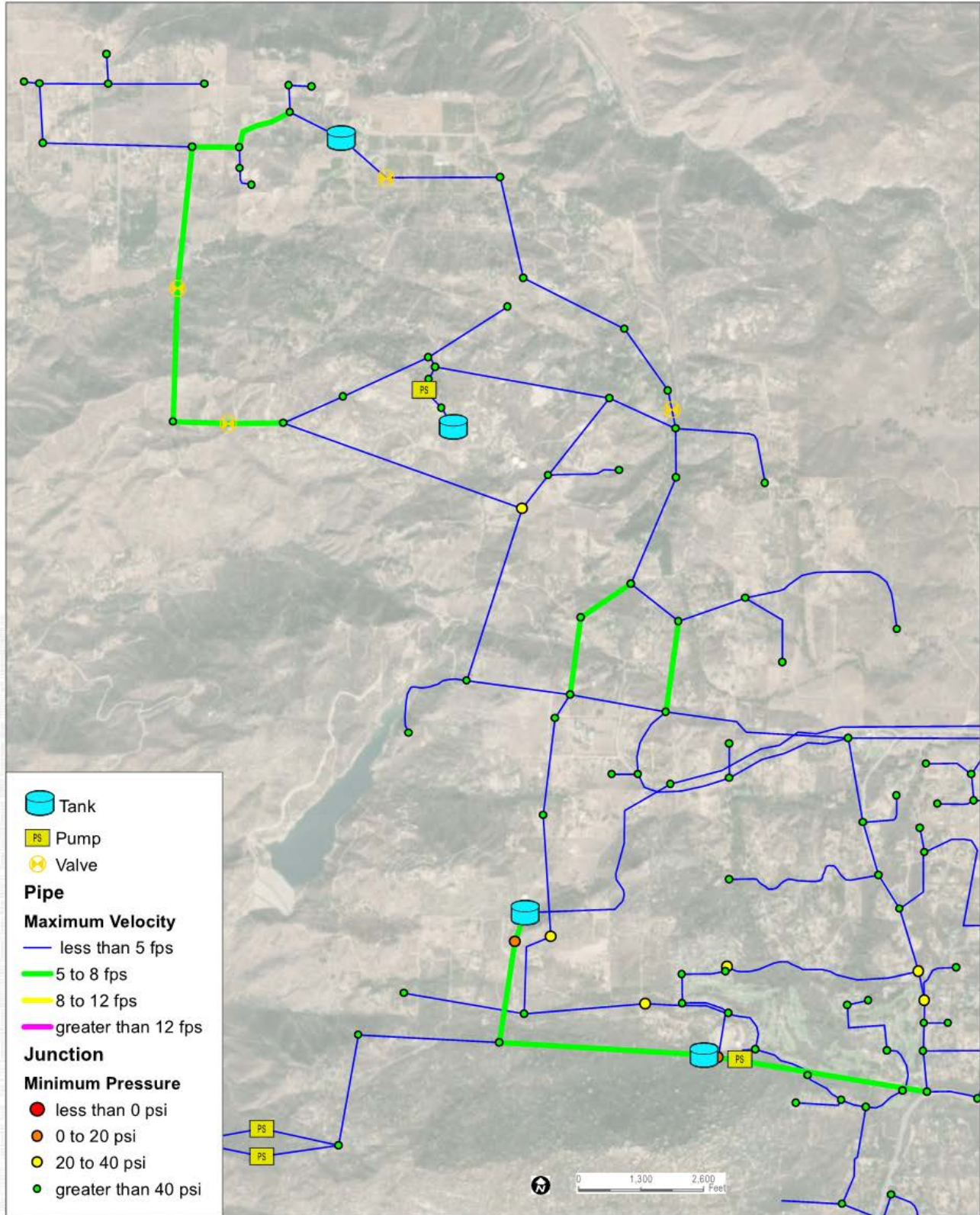
Discontinuance of untreated water service is a viable means of controlling increasing untreated water costs. Approximately 12,100 linear feet of 12-inch pipeline and 15,055 of 16-inch pipeline will be required to be replaced to accommodate conversion of all untreated demands to the potable system, at an approximate cost of \$6,500,000. Untreated water would continue to be conveyed to Lake Ramona to maintain permitted minimum water levels in the lake and serve the contract customer.

Figure 7 – Treated Water System with Untreated Demand



SOURCE:

Figure 8 – Improved Treated Water System with Untreated Demand



SOURCE:

3.4 Convert Untreated System to Treated Non-Potable System

Creation of a treated non-potable water system results in elimination of untreated water purchases. To accomplish this conversion, the District would need to construct a new steel tank at the Poway Pump Station site as a forebay to the untreated water pumps. The tank would fill through an air gap connection from the existing potable water tank. The potable water is then conveyed throughout the existing untreated water system.

This alternative does not eliminate any existing untreated water facilities, requiring the continued operation and maintenance of the system, as well as the potable water system. The treated non-potable water system could not be integrated into the potable water system. This alternative has the same effect of moving all demands to the potable water system, without the corresponding cost savings.

Based on the viability of eliminating the untreated system, this alternative is unwarranted and unnecessary.

3.5 Minimize Untreated Water System Service

Minimization of the untreated water system would be accomplished by transferring smaller portions of the untreated demands to the potable water system over time. In this manner, portions of the untreated system could be abandoned once they are no longer operationally viable or cost effective, thereby saving money for the District. All untreated demands can be transferred to the potable water system, with some system replacements. Abandonment of portions of the untreated system would be accomplished by systematically transferring customers and hydrants from the untreated system to the potable system over time.

3.6 Ramona Lake Alternatives

As stated in Section 3.3, discontinuing portions of the untreated water system can be accomplished, at least initially, separate from a decision relative to Lake Ramona. Over time, portions of the untreated water system can be eliminated by transferring demands and fire hydrants to the potable water system. Currently, only the contract customer is served directly from Lake Ramona.

Long-term changes with Lake Ramona are complicated undertakings requiring considerable research. However, while the District is evaluating its options relative to Lake Ramona, it is entirely reasonable to minimize evaporative losses by lowering the lake level to minimize the surface area of Lake Ramona. Potential environmental considerations may limit the level to which the lake can be lowered.

Lake Ramona was originally one component of a regional water supply project for Ramona. Lake Ramona would provide a large untreated reservoir for seasonal storage and a treatment plant located at Lake Ramona would provide treated water. The lake and the treatment plant were symbiotic in the sense that both facilities were necessary to gain the maximum benefit for the District. Lake Ramona was completed in 1988, but the treatment plant was never completed. In 1998, the District paid CWA to construct the Ramona 3 pipeline to provide treated water to Ramona. The decision to not construct a water treatment plant and connect directly to CWA for treated water in the 1990's eliminated the ability of the District to cost effectively utilize the lake for its intended purpose as a companion to a water treatment plant.

Lake Ramona, currently incurs annual costs of approximately \$120,000 for CWA capacity fees, \$410,000 in evaporation losses, permitting cost of approximately \$70,000, and contract customer costs of approximately

\$350,000. These annual costs total approximately \$950,000 per year. These costs are in addition to untreated water costs from CWA that are continuing to increase.

Options associated with Lake Ramona are very limited given the nature of dam ownership versus regulation, and would require considerable additional research.

3.7 No Project Alternative

The District is faced with significantly increasing operation and maintenance costs, increasing untreated water costs and declining untreated water sales. The “No Project” alternative does not address any of these issues. As elimination of the untreated water system is viable, doing nothing is contrary to the purpose of this analysis and does not reduce costs to the District or the ratepayers. The No Project alternative is therefore rejected and unnecessary.

4 Preferred Alternative Implementation

Based on the analyses performed, the District has a viable means of eliminating the existing untreated water distribution system, as outlined in the following discussions.

4.1 Preferred Alternative

The preferred alternative is to eliminate a portion of the untreated water system (Woodson) by transferring existing untreated customers and fire hydrants to the existing potable water system and converting some of the untreated system to recycled water. The District will continue to monitor untreated water demands and costs in the remaining zones to identify any future cost savings or operational efficiencies.

Fire protection is supplied by both the treated and untreated water systems. As each system is capable of meeting the required fire flow, there is no direct impact of transferring fire hydrants from the untreated water system to the treated water system. However, the existing treated water system has locations where fire flow is not maintained (primarily because of pressure zone limitations). The District will evaluate these deficiencies as part of the ongoing Water System Master Plan Update, and treated water system improvements may be required, over time, to improve system wide fire response.

A portion of the existing untreated Woodson pressure zone will be converted to supply recycled water to existing and potentially new recycled water customers. This conversion allows the District to maximize recycled water use and sales, while providing elevated water storage to the recycled water system for more efficient overall operation.

Lake Ramona is recommended to be lowered to the lowest water level acceptable for continued service to the contract customer, thereby minimizing water loss to evaporation. Additional research and analysis will be required to better evaluate options for Lake Ramona.

Finally, proposed new rates for treated pumping and untreated pumping will be developed.

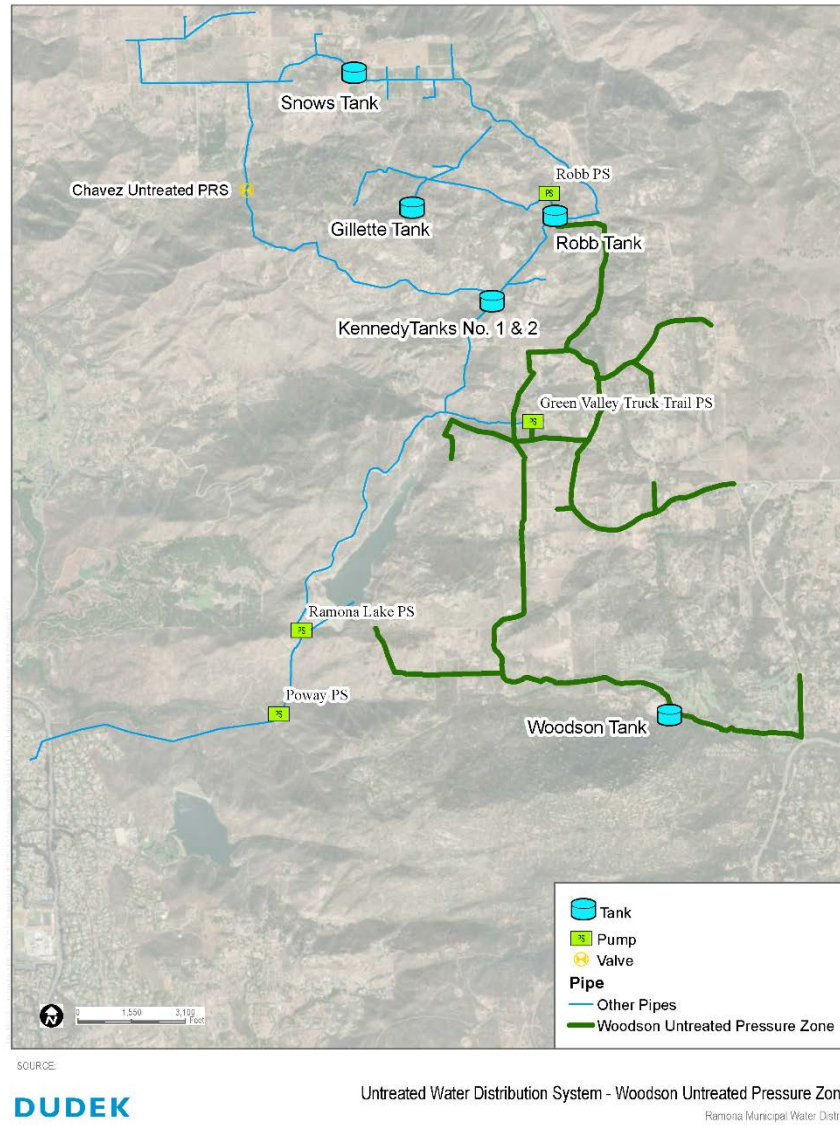
4.2 Phased Implementation Plan

Having defined the components to address the untreated water system, this section defines the proposed phasing of plan implementation. The purpose of the phasing plan is to assure that disposition of the untreated water system is orderly and can be accomplished through a pay-as-you-go financial process. The identified phasing is based on information known at the time of this analysis. The District will monitor the implementation plan and make appropriate corrections over time.

4.2.1 Phase 1 – Woodson Untreated Pressure Zone Elimination

Phase 1 of the implementation plan will involve elimination of the existing Woodson Untreated Pressure Zone (**Figure 9**). Based on billing records, the Woodson Untreated Pressure Zone has 57 active untreated meters, with a total average day demand of 267 afy (ranging from the largest single user of 12.40 afy to the smallest single user of 0.00 afy).

Figure 9 – Woodson Untreated Pressure Zone



Implementation of Phase 1 will involve the following activities:

1. Existing untreated water users will be notified, in advance, by the District that untreated water service will be eliminated. These users can contact the District to identify their preference of converting their untreated demand to treated water, recycled water or eliminating their existing untreated connection. All untreated water users will have to request conversion or elimination of untreated water service.
2. Each untreated water user requesting conversion from untreated to treated water service will be required to file an Application for Treated Water Service in accordance with the District Legislative Code. In evaluating the application, District staff will evaluate the user’s treated water demand, and the user will purchase appropriate water system capacity. The District will offer appropriate payment arrangements (i.e. payment plan) to minimize the burden of untreated water conversion on the user.
3. Untreated water users that choose to eliminate their untreated water demand will be disconnected from the untreated water system, without reconnection to the treated water system.

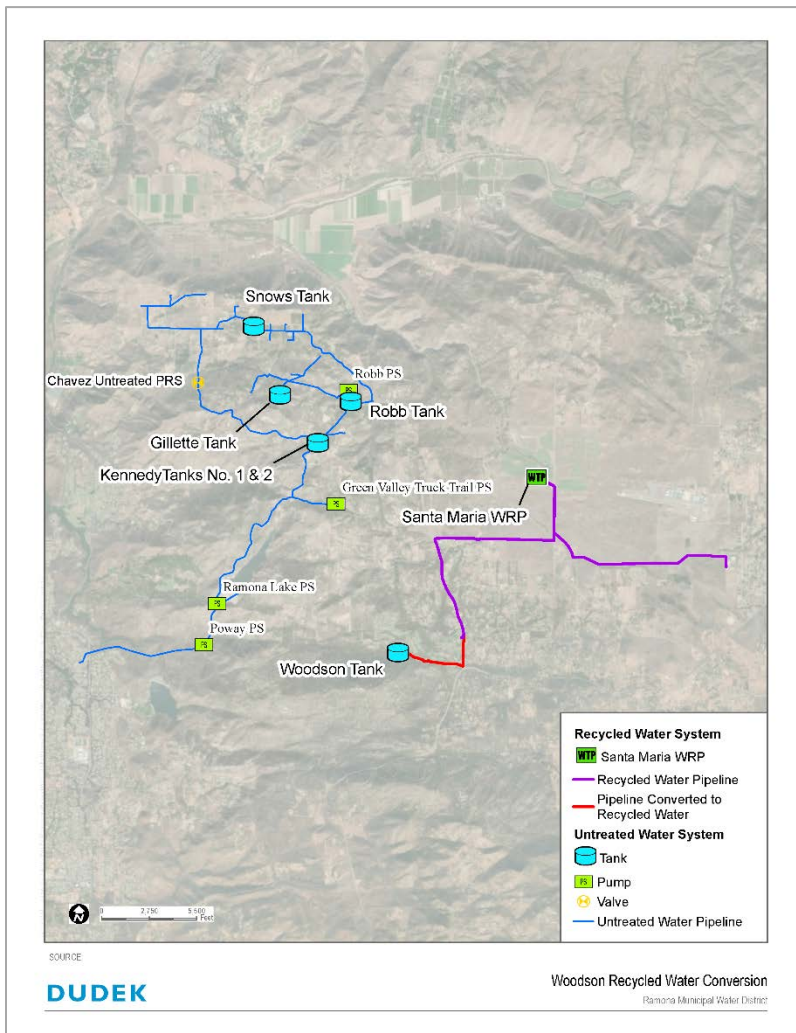
The District will continue to operate the untreated water system within the Woodson Pressure Zone for a period of time, after which the Woodson Untreated Pressure Zone will no longer be operated. Parallel with untreated service evaluations, District staff will transfer Woodson Untreated fire hydrants to the treated water system. Upon completion of Phase 1, the Woodson Untreated Pressure Zone will no longer exist.

4.2.2 Phase 2 – Woodson Tank Conversion to Recycled Water

Following elimination of untreated water service to the Woodson Untreated Pressure Zone (Phase 1), the District will convert the existing Woodson steel tank and tributary pipeline to the existing recycled water system. As the recycled water system is not for potable consumption, no disinfection or other efforts will be required to accomplish this conversion. **Figure 10** shows the existing Santa Maria Recycled Water System and the portion of the Woodson untreated system to be converted. A portion of the original untreated water system was previously converted to recycled water service to facilitate water deliveries to the Mount Woodson Golf Course. Conversion of additional pipeline and the Woodson tank will facilitate recycled water deliveries to other potential recycled water users, including the Woodson Castle Property and other agricultural users adjacent to the pipeline alignments.

With these facilities, District staff will be capable of maximizing recycled water use. For example, during summer months, Mount Woodson Golf Course uses all recycled water that the District creates. During the winter months, the golf course uses little to no recycled water. Additional recycled water users will moderate recycled water use,

Figure 10 – Woodson Recycled Water Conversion



thereby lowering the need to dispose of water at the Santa Maria Spray Fields and increasing recycled water revenues throughout the year. The Woodson tank has an air-gapped treated water connection, allowing the District to supplement the recycled water system with treated water under conditions where recycled water production is exceeded.

4.2.3 Phase 3 – Lake Ramona Water Level

At the completion of Phase 3, the District will maintain the ability to convey untreated water from the CWA aqueduct to Lake Ramona, via the Poway Untreated Pump Station. Maintaining this capability is necessary to support the existing contract customer agreement. Under this phase of implementation, the District will lower Lake Ramona to its lowest allowable water level to minimize evaporation losses. Water served to the contract customer will continue to come from Lake Ramona under the contract customer agreement. The suction pipeline from Lake Ramona to the contract customer pump station will need to be extended to accommodate the lower

water level of the lake. However, under the agreement, extending the suction pipeline is the responsibility of the user. The District will continue to evaluate alternative methods of serving the contract customer, as well as monitoring the ongoing demand.

4.2.4 Phase 4 – Remaining Untreated Pressure Zone Review

At some future time, Phase 4 will review the remaining untreated pressure zones, including the Kennedy, Robb, Snows and Gillette Pressure Zones. If future untreated water demands continue to decline then additional pressure zones could be eliminated, starting with the lowest pressure zone to the highest pressure zone. The reason for starting with the lowest pressure zone is to allow the abandonment of untreated water infrastructure within each pressure zone as elimination is completed.

The Snows Untreated Pressure Zone has 38 active untreated meters, with an average day demand of 178 afy. Untreated water demand ranges from a high of 52.65 afy to a low of 0.03 afy. Elimination of the Snows pressure zone will eliminate one storage tank and two pressure reducing stations.

The Robb Untreated Pressure Zone has 16 active untreated meters, with an average day demand of 220 afy. Untreated water demand ranges from a high of 43.90 afy to a low of 0.04 afy. Elimination of the Robb pressure zone will eliminate one storage tank and one pressure reducing station.

The Gillette Untreated Pressure Zone has 16 active untreated meters, with an average untreated demand of 87 afy. Untreated water demand ranges from a high of 22.85 afy to a low of 0.02 afy. Elimination of the Gillette pressure zone will eliminate one storage tank and one pump station.

The Kennedy Untreated Pressure Zone has 11 active untreated meters, with an average day demand of 75 afy. Untreated water demand ranges from a high of 27.33 afy to a low of 0.03 afy. The Kennedy pressure zone must be the last eliminated because all untreated water passes through the Kennedy pressure zone before reaching the other untreated pressure zones. Elimination of the Kennedy pressure zone will eliminate two storage tanks and one pump station.

4.2.5 Phase 5 – Lake Ramona

The final component of the implementation plan will be a decision on Lake Ramona. Decommissioning or sale of an existing dam involves significant considerations, involving sediment, environmental, habitat restoration, and many other regulatory challenges. As such, considerable additional study is required before the District will be able to develop an implementation plan regarding Lake Ramona. Considering the significant time required to complete Phases 1 through 3 of the implementation plan, the District will have considerable time to evaluate alternatives before making final decisions. Phase 5 is listed here as part of the implementation plan to initiate discussion and alternative evaluation while the other phases are implemented.

4.3 Projected Operation & Maintenance Savings

Based on achievement of the implementation plan presented in Section 4.2, it is projected that the District will realize the following operation and maintenance savings:

1. Phase 1: Conversion and elimination of the Woodson Untreated Pressure Zone will eliminate ongoing operation and future maintenance costs for the Green Valley Truck Trail Pump Station. Annual power cost savings for this pump station is approximately \$38,200. In addition, ongoing maintenance and repair of the pipelines in this pressure zone is eliminated. Updated Treated and Untreated Pumping Rates, as discussed in Section 2.2, the FY2019/20 unit rate for pumping untreated water has been computed to be

\$1.23 per hundred cubic feet (ccf), based on the revenue requirement to operate and maintain the untreated facilities and the total water purchased by District customers. The treated water rate has been computed to be \$0.92 per ccf, on the same basis for the treated water system. The current pumping rate for all customers is \$0.99 per ccf.

2. Phase 2: Converting the Woodson Untreated Storage Tank to recycled water use. This action will increase the size of the recycled water system in the Santa Maria Valley, greatly improve the ability of the District to serve recycled water and increase the potential number of recycled water users.
3. Phase 3: Lower Lake Ramona. Current evaporative losses from Lake Ramona are computed to be approximately \$410,000 per year. Lowering the lake level to decrease the lake's surface area is projected to save the District approximately \$200,000 per year in evaporative losses.
4. Phase 4: Continue to review the untreated water demands and costs in the Snows, Robb, Gillette and Kennedy Untreated Pressure Zones. It is estimated that eliminating ongoing operational and maintenance costs for the following facilities would reduce costs:
 - a. Snows pressure reducing valve (PRV) and the Chavez PRV - \$2,500
 - b. Snows storage tank rehab - \$285,000
 - c. Robb pump station - \$20,700, increasing annually
 - d. Robb pump station rehab - \$70,000
 - e. Robb storage tank rehab - \$570,000
 - f. Gillette pump station - \$1,200, increasing annually
 - g. Gillette storage tank rehab - \$285,000
 - h. Lake Ramona pump station - \$141,000, increasing annually
 - i. Kennedy storage tank rehab - \$1,900,000 (1 of 2 tanks rehabbed)
 - j. Poway untreated pump station rehab - \$600,000

In addition to tank, pump station and PRV savings, the ongoing maintenance and repair of the pipelines in these pressure zones would also be eliminated.

The potential elimination of the untreated water system over time could result in annual power and O&M savings to the District of approximately \$577,200 per year. In addition, the District will avoid approximately \$41,745,000 in capital facilities replacement costs for the entire untreated water system, including pipelines, pump stations, and storage tanks. The District will still be required to continue to pay \$120,000 for the CWA untreated water turnout and \$70,000 in state dam permitting fees per year.

The annual cost of operating the Poway Untreated Water Pump Station is approximately \$231,000 per year and increasing on an annual basis. These costs would decrease if demands continue to decrease.

5. Phase 5: Lake Ramona requires extensive review prior to identifying viable options. Therefore, there is no identified cost savings for Phase 5, outside of roughly \$169,000 in annual pumping costs should a reduction in pumping to Lake Ramona be warranted.

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