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MEMORANDUM

To:	Craig Schmollinger, Acting General Manager
From:	Michael Metts, PE, District Engineer
Subject:	Untreated Non-Potable Alternative Analysis: Snows Untreated Pressure Zone
Date:	June 23, 2021

1 Purpose

Ramona Municipal Water District (District) has established March 31, 2022, as the completion date for decommissioning of untreated water system and untreated water services. The Boards decision to decommission the untreated water system is a culmination of multiple factors (e.g., severely declining untreated water sales, $42M in identified system capital rehabilitation needs, etc.) that would ultimately raise untreated rates to untenable levels, significantly above that of treated water rates, negatively impacting District customers. To continue to offer untreated and/or agriculture customers a sustainable long-term water solution, the District developed the Untreated Water Service Conversion Program (Program). The intent of the Program is to provide untreated water customers an opportunity to relocate their untreated water connection to the treated water system, with the District and customers sharing costs in doing so as appropriate.

The District received several questions relative to the Program, many of which were similar. As such, District Staff and two Board members held an informational workshop, whereby untreated water customers were provided additional details on the Program. During the workshop, the question arose regarding establishment of a treated non-potable alternative for the Snows Untreated Pressure Zone, as well as potentially the Robb Untreated Pressure Zone. The purpose of this memorandum is to elaborate on the monetary and non-monetary considerations of this alternative versus those of the ongoing Board approved Program. For the purposes of this analysis, only the Snows Untreated Pressure Zone is addressed, as this zone has significantly more cost considerations.

1.1 Snows Treated Non-Potable Water Service Alternative

Water is tributary to the untreated water system by way of a District turnout (RAM1) and the Poway Untreated Pump Station. The Ramona Lake Pump Station (RLPS) pumps untreated water through a 27-inch pipe, between the Poway Untreated Pump Station and Lake Ramona, which is in turn pumped into the untreated water system. The untreated water system is divided into multiple pressure zones, as defined below:

- **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 Snows tank is fed 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. These system components are illustrated graphically on **Figure 2.**

Figure 1 – Untreated Water System Schematic

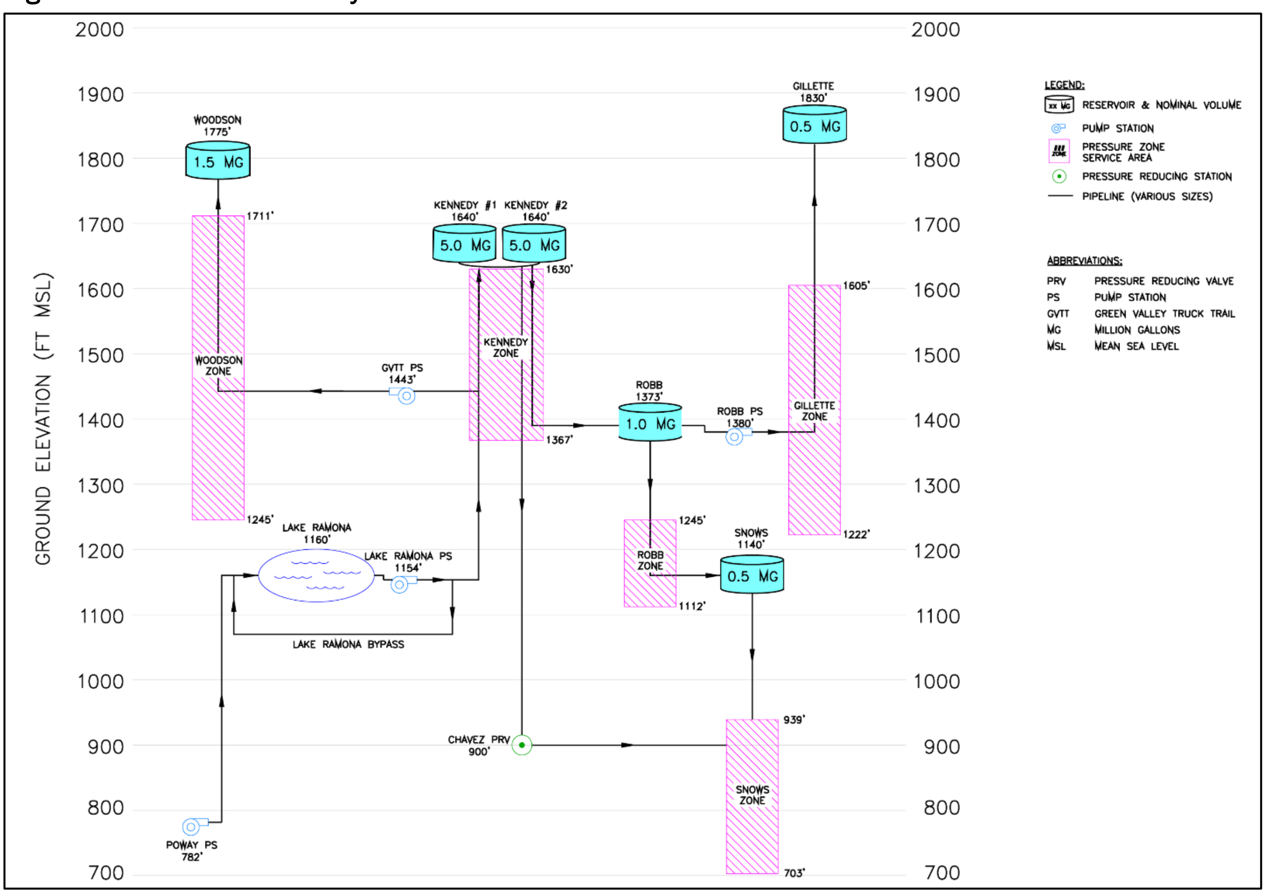
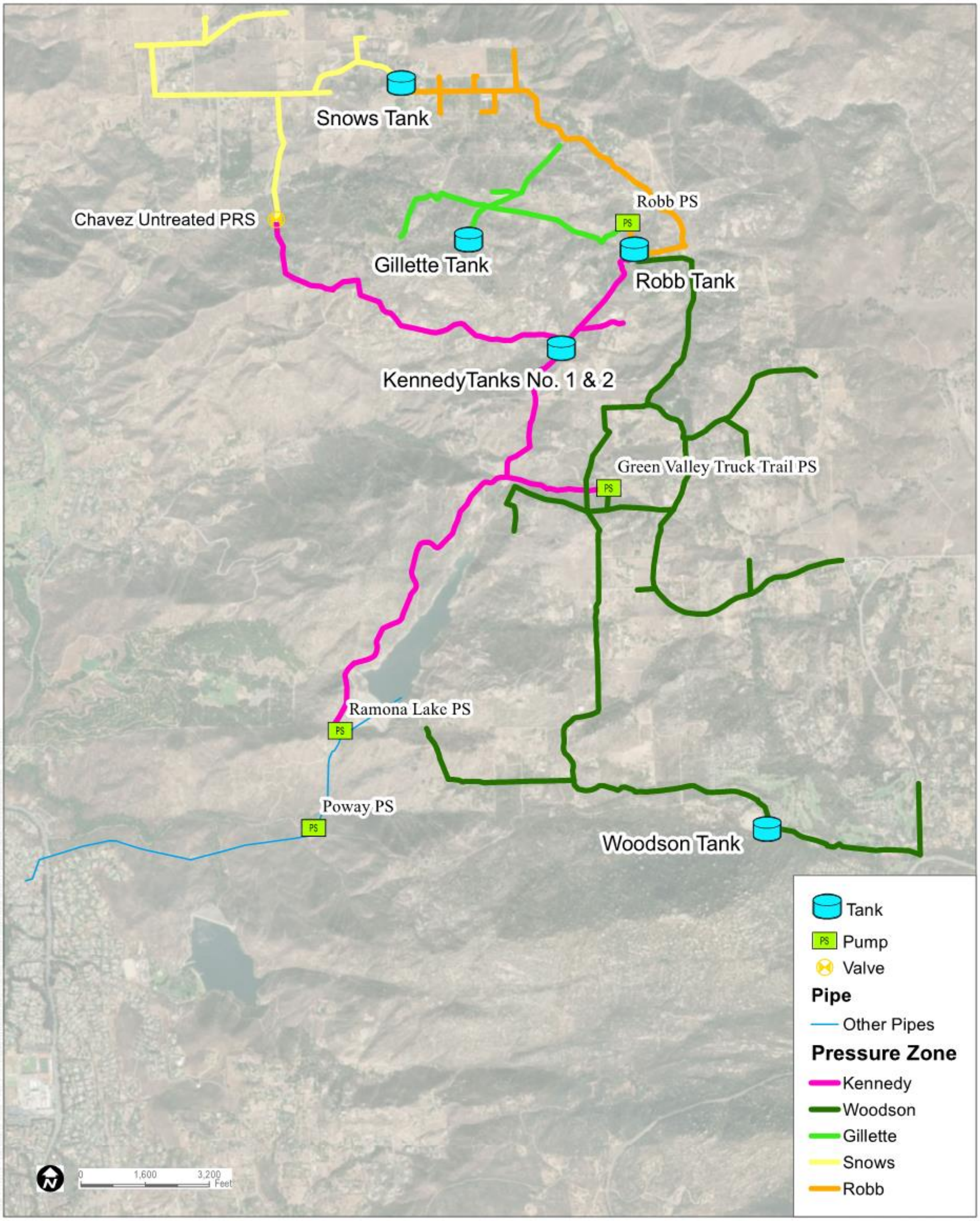


Figure 2 – Untreated Water Distribution System



The Snows Pressure Zone, shown in yellow on Figure 2, was the subject of aditional discussion at the District's recent untreated water workshop. As shown on Figure 2, the Snows Untreated Pressure Zone has two sources of water, including the Snows Untreated Tank and the Chavez Untreated Pressure Reducing Station (PRS). During the workshop, it was hypothisized that the Snows pressure zone could be converted to a treated non-potable water system. A treated non-potable zone is created by feeding treated water into an untreated system, typically by way of an air gap connection to assure no possibility of cross-connection or backflow. In the case of the Snows Untreated Pressure Zone, the Chavez Untreated PRS would also be required to be removed to prevent water from the Kenndy Untreated Pressure Zone from entering the treated non-potable system.

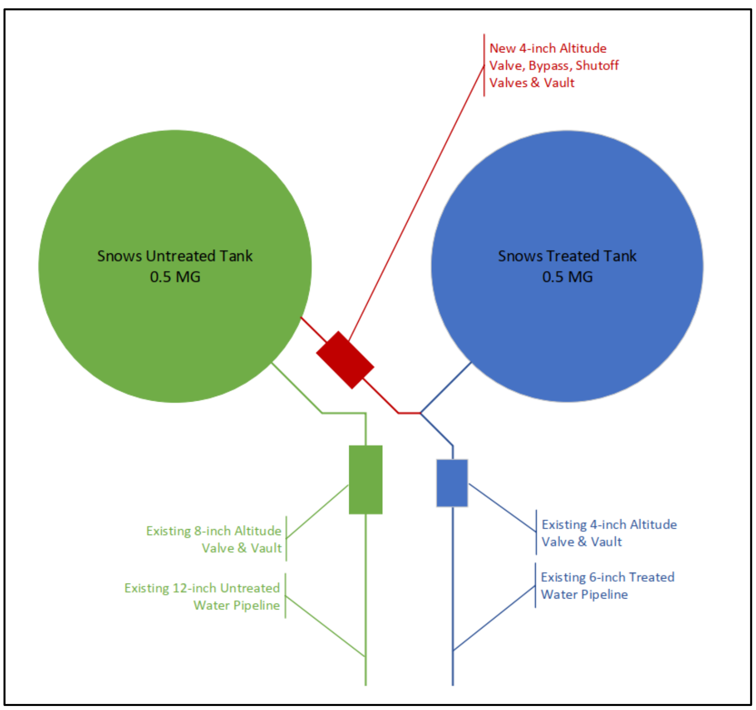
Based on the comments at the workshop, the District Board members present at the workshop requested evaluation of this alternative scenario in comparison to the ongoing Conversion Program. This memorandum presents the findings of that preliminary analysis.

The underlying premise of the treated non-potable option is the remaining useful life of the untreated water system facilities. Portions of the Snows untreated water facilities date back to the 1960's and others to 1979. As such, the remaining useful life is currently indeterminant. The proposed premise is that the facilities have not experience significant failures to date, and that the treated non-potable system could be implemented to avoid conversion of hydrants and meters today. Under this hypothetical situation, these conversions would be completed in the future when the Snows untreated facilities fail.

1.1.1 Monetary Considerations

To identify the infrastructure needs for treated water conveyance to the Snows Untreated Water Tank, we reviewed the existing plans for the pipelines and tanks in the Snows system. **Figure 3** provides an illustrative plan view of the existing tanks and pipeline connections.

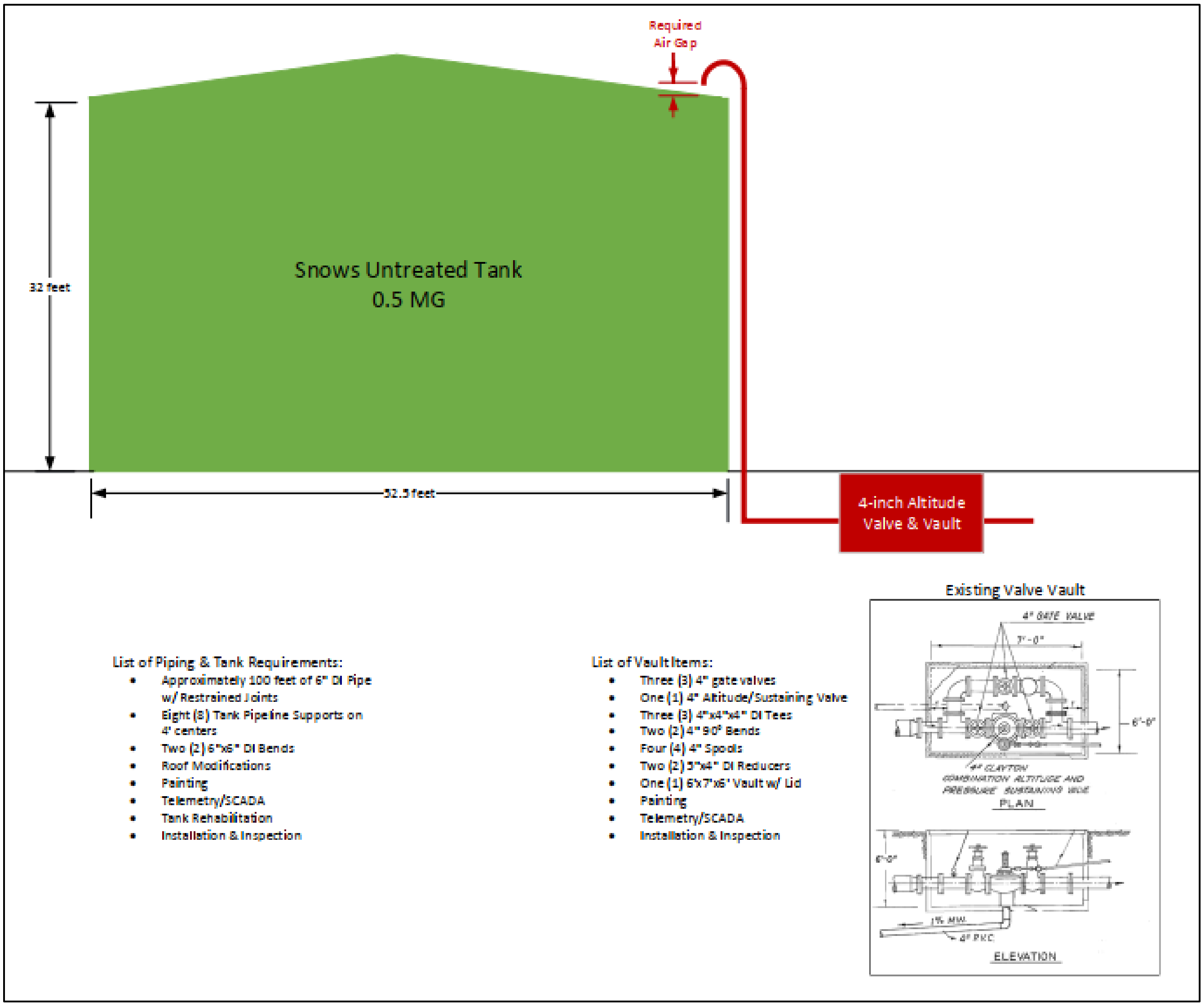
Figure 3 – Snows Tanks and Pipeline Connections (Plan View)



As shown on Figure 3, there are two 0.5 million gallon (MG) storage tanks on the Snows site, one treated water and one untreated water. The existing untreated water tank receives water from an existing 12-inch untreated pipeline, passing trough an existing altitude valve vault. The valve vault comprises piping and valving for an altitude and pressure sustaining valve that maintains pressure in the higher pressure zone, while monitoring the water level in the tank to prevent overtopping.

The treated water tank has similar pipeline and control systems, with water conveyed into the tank from a 6-inch treated pipeline and a similarly configured 4-inch altitude valve and vault. As shown on Figure 3, connection of the treated water pipeline to the untreated water tank will require new piping and a third altitude valve vault. This third valve vault would provide monitoring and control of the treated water connection similar to the existing control systems. **Figure 4** provides an elevation schematic of the proposed new untreated tank connections.

Figure 4 – Snows Tanks and Pipeline Connections (Elevation View)



As shown on Figure 4, the untreated tank is 52.5 feet in diameter and 32 feet tall. The hypothetical new treated water connection required under this concept would be required to travel up the outside wall of the tank to an air gapped connection at the roof. Roof modification would also be necessary. The figure identifies the piping and tank required construction, as well as the valve vault construction. It is noted that the valve vault construction is the same as the existing valve vaults at the site.

Based on the cost opinion provided in Appendix A, the projected cost of the hypothetical scenario required treated water connection to the Snows Untreated Water Tank is approximately $800,000, including rehabilitation of the existing untreated tank. The Snows Treated Water Tank was rehabilitated last year at a cost of $325,000. As the District cannot complete the required construction on its own, the cost opinion includes preparation of design plans and specifications, bidding and award, and construction of the facilities. It is estimated that the construction, including tank rehabilitation, would take approximately six to nine months to complete. Postponement of the Conversion Program could be a reality under this scenario and would result in a projected increase in Conversion Program costs of approximately three percent per year, resulting in an additional $100,000 in conversion costs in ten years.

1.1.2 Non-Monetary Considerations

To fully consider the comparative nature of this alternative, the following non-monetary challenges are necessary to be considered:

1. The premise that hydrant and meter conversions will be completed AFTER the existing facilities begin to fail has unintended but considerable consequences. For example, if an existing Snows pipeline were to fail, District staff might be capable of repairing the pipeline is a day or two, depending on the nature of the failure. However, if the Snows tank were to fail, it could take a few weeks for the District to hire the appropriate contractor to complete those repairs. The unintended consequence is the impact to the agricultural growers in the Snows pressure zone, who would be without water for the duration of the repair period. Depending on the time of year, several days of water outage could be significant to the value of the growers' crops.

2. In general, the District as a California Public Agency, does not operate its water delivery facilities to failure before implementing corrective actions. This concept is specifically included as a stated goal in the District's Legislative Code in providing safe and reliable water services (for example, section 7.76.030.E.). Taking the Untreated Water Decommissioning effort currently underway, the District is taking pre-emptive action to assure that the aging untreated facilities are addressed BEFORE the facilities begin to fail and impact District customers.

3. To implement the treated non-potable option, the District would be required to account for the aging infrastructure of the Snows untreated water system and those costs would need to be borne by those benefitting from ongoing operation and maintenance of those facilities. This need would create different classes of treated water users, resulting potential inequities within the District service community, which also goes against the District's stated Mission Statement of "Equitable: customers equally share the costs and receive the same quality of services" (section 1.04.010.D. of the District Legislative Code).

1.2 Ongoing Conversion Program Alternative

By comparison, implementation of the ongoing Conversion Program also has its own costs. Based on existing facilities, the Snows untreated pressure zone has a total of 13 untreated fire hydrants. In addition, there are 44 total untreated water services in the pressure zone, of which six are inactive, five have been previously abandoned, and two have been requested for conversion. This leaves a total of 31 untreated water services to be converted or abandoned. No other construction is required under the Conversion Program for the Snows Untreated Pressure Zone.

1.2.1 Monetary Considerations

Based on Conversion Program work already completed, fire hydrant conversions are being completed at a cost of approximately $15,000 each. Therefore, the projected cost for 13 fire hydrant conversions is approximately $195,000.

For the purposes of this analysis, we are assuming that the 31 remaining untreated water services will be converted to treated water services, as this is the highest potential cost. The average deposit for service conversion is approximately $4,000. However, the cost of the new meter is not being charged, leaving the average cost at approximately $3,500 per service connection being converted. Assuming the 31 services remaining, the total cost is approximately $108,500 if the entire deposit is used.

Therefore, the projected cost to continue implementation of the Conversion Program in the Snows zone is approximately $303,500 with customers responsible for their individual connection costs ($108,500 if the entire deposits are used) and the District responsible for the fire hydrant conversion costs ($195,000).

1.2.2 Non-Monetary Considerations

As with the non-potable system alternative, implementation of the Conversion Program has non-monetary considerations:

1. Conversion of existing untreated facilities is required to be completed by March 31, 2022. Under this timeline, existing untreated customers need to move quickly to schedule work by District forces.

2. Several untreated customers expressed frustration with the need for the Conversion Program. At the Untreated Water Workshop, the District attempted to convey the need for decommissioning of the untreated water system, which results in significant savings to untreated customers over time, while noting the immediate benefits to untreated customers.

3. Failure to complete the Conversion Program will result in ongoing losses within the untreated water system, which may be required to be incorporate into a new untreated water rate to assure that all District water customers are treated equitably.

4. Under the Conversion Program, untreated water will no longer be available from the Kennedy Tanks. Providing a non-treated water connection through the Snows untreated tank will result in a single source of water for the agricultural demand because of the Chaves untreated pressure reducing station (PRS) closure. By converting to the treated water system, agricultural demands will be met through the Snows treated tank and the Chavez treated PRS. The Conversion Program provides the pressure zone with two sources of water to meet demand.

1.3 Conclusions and Recommendations

Based on the analyses performed, the cost of the Snows Non-Potable Zone options for a treated non-potable hypothetical system in the Snows Untreated Pressure Zone is approximately $800,000, with an additional $100,000 in ten years required over and above the current costs of conversion, for a total of approximately $900,000. If the Snows untreated tank were not rehabilitated (which is not recommended), the cost for this option is approximately $400,000. In comparison, the cost of implementing the Conversion Program is approximately $303,500, with cost splits between untreated customers and the District as noted above.

Based on the analyses performed, the District and the untreated water customers would be best served to continue implementation of the ongoing Conversion Program, thereby saving costs, addressing untreated water challenges at the earliest possible date and minimizing or avoiding potential impacts to District customers in the future.

APPENDIX A

Snows Treated Non-Potable Water System Costs

Opinion of Probable Construction Cost

Cost Opinion Report

Company:	Dudek	**Date:**	6/15/2021
Project:	Snows Non-Potable Analysis	**By:**	DMM
Submittal:	Engineering Opinion	**Checker:**	DMM

Summary of Costs **Specification Division**			**Total**
Division 1 - General Requirements		$	57,500
Division 2 - Sitework		$	481,000
Total Construction Cost Opinion		$	539,000
Project Level Allowance for Class 1	10%	$	53,900
Insurance	1.5%	$	8,100
Overhead and Profit	15%	$	80,900
Bond	1%	$	5,400
Engineering & Construction Management	15.0%	$	80,900
TOTAL PROJECT COST		**$**	**763,000**

Opinion of Probable Construction Cost of SOCWA Export Sludge Force Main

Project	Snows Treated Non-Potable Analysis	Job No.	7039.0063
Client	Ramona MWD	Estimate by:	DUDEK
Location	Highlanf Valley	Job Status:	100%
Date:	6/15/2021	Notes:	
Area:			

Item	Item Description	Qty	Unit	Materials $/Unit	Labor $/Unit	Equipment $/Unit	Total $/Unit	Total Net Cost $
	Division 1 - General Requirements							$ 57,500
1	Mobilization/Demobilization	1	LS				$ 25,000	$ 25,000
2	Surveying	1	LS				$ 10,000	$ 10,000
3	Clean-up and Disposal	1	LS				$ 5,000	$ 5,000
4	Testing/Hydrostatic Leak Testing	1	LS				$ 5,000	$ 5,000
5	Traffic Control	1	LS				$ 2,500	$ 2,500
6	Construction Schedule	1	LS				$ -	$ -
7	Contractor's Staging Area	1	LS				$ -	$ -
8	Sanitation Facilities	1	LS				$ 5,000	$ 5,000
9	Project Signs	1	LS	$ 2,500	$ 2,500		$ -	$ -
10	Temporary Fencing	1	LS				$ -	$ -
11	Inspection/Encroachment Fees	1	LS				$ 5,000	$ 5,000
12	Subsurface Investigation	1	LS				$ -	$ -
	Division 2 - Sitework							$ 481,000
1	Demolition and Removal	0	LF				$ -	$ -
2	Clearing and Grubbing	1	LS				$ 15,000	$ 15,000
3	Site Prepration, Excavation, and Earthwork	40	CY		$ 10.00	$ 5.00	$ 15	$ 1,000
4	SWPPP/BMPs	1	LS				$ 5,000	$ 5,000
5	AC Pavement Removal	0	SY				$ -	$ -
6	AC Pavement	0	SY				$ -	$ -
7	Tie-Into Existing 6-Inch Treated Pipeline	1	LS				$ 15,000	$ 15,000
8	New 4-Inch Altitude/Sustaining Valve & Vault	1	LS				$ 50,000	$ 50,000
9	6-Inch DI Piping w/ Restrained Joints & Bends	100	LF				$ 250	$ 25,000
10	Tank Supports	8	EA				$ 250	$ 2,000
11	Tank Roof Modifications	1	LS				$ 15,000	$ 15,000
12	Trench Backfill and Compaction	40	CY	$ 20	$ 15	$ 5	$ 40	$ 2,000
13	Pipe Bedding	10	CY	$ 30	$ 10	$ 5	$ 45	$ 1,000
14	Painting/Telemetry/SCADA	1	LS				$ 25,000	$ 25,000
15	Tank Rehabilitation	1	LS				$ 325,000	$ 325,000
Total								**$ 538,500**
Total Project Costs								**$ 538,500**