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CONSULTING ENGINEERS

ADDENDUM NO. 1 TO THE
WATER SYSTEM ANALYSIS FOR THE
SOUTHWEST VILLAGE VTM 1 WATER
STUDY IN THE CITY OF SAN DIEGO
PTS# 614791

June 14, 2024

2234 FARADAY AVENUE • CARLSBAD, CA • (760) 438-4422

ADDENDUM NO. 1 TO THE WATER SYSTEM ANALYSIS FOR THE SOUTHWEST VILLAGE VTM 1 WATER STUDY IN THE CITY OF SAN DIEGO PTS# 614791

June 14, 2024

6-14-2024

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648-031

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San Diego, CA 92128

Attention: Allen Kashani, P.E., Senior Project Manager

Subject: Addendum No. 1 to the Water System Analysis for the Southwest Village VTM 1 Water Study in the City of San Diego (City), PTS# 614791

Introduction

This report is the first addendum to a previous report entitled "Water System Analysis for the Southwest Village VTM 1 Project in the City of San Diego" dated June 27, 2023, prepared by Dexter Wilson Engineering, Inc. (June 2023 Water Study). The June 2023 Water Study analyzed the existing and proposed buildout public water system which included a hydraulic analysis to confirm the adequacy of the existing and buildout proposed public water system in the vicinity of the project.

As part of this Addendum No. 1, pumped hydraulic capacity will be analyzed to reflect the current existing hydraulic capacity remaining in the 680 Zone in which the Southwest Village project is located in. The corresponding proposed 800 unit Phase 1 water system will be presented and analyzed as well. Southwest Village phasing beyond VTM 1 will consist of VTM 2 as the next phase.

Southwest Village VTM 1 Water System Analysis Addendum No. 1

This Public Water Study Addendum No. 1 (Addendum No. 1) provides an update to the Phase 1 water service for the Southwest Village development because of the updated existing water use data within the 680 Zone public water system. Phase 1 is proposed to consist of the first 800 units of VTM 1. This Addendum No. 1 addresses the project water demands, various fire flows, and the current water demand conditions for the overall 680 Zone. An overview map of existing 680 Zone facilities is included in Attachment A for reference.

The purpose of Addendum No. 1 is to hydraulically evaluate the existing capacity of the 680 Zone for Southwest Village through its only current water booster station (Ocean View Hills) and evaluate the water system for the Southwest Village 800 unit initial phase via a hydraulic computer model. The City will require Southwest Village to perform a condition assessment report for the Princess Park Pump Station and complete the pertinent improvements to the station and pipelines prior to the construction of the 801st unit.

A current schedule for Southwest Village VTM 1 is shown below. The 800th unit and completion of Phase 1 is anticipated to be in approximately the year 2030 depending on market conditions. The project will complete the required improvements at Princess Park Pump Station stemming from the condition assessment and complete the western Beyer Boulevard and Otay Mesa Road 680 Zone pipeline extensions before Phase 1 is completed.

Schedule:

Community	2023			2024				2025				2026				2027				2028				2029				2030			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
SW Village VTM 1	Entitlements/Permitting									Grading/Improve				Models/Production																	

Southwest Village Water Demand Projections

Water demands for Southwest Village are shown as part of this Addendum No. 1 for reference. The water demands are copied from the June 2023 Water Study. Table 1 summarizes the average water demand for the entire Southwest Village project.

This June 2023 Water Study has assigned water use factors to each of the different land use categories based on City of San Diego Design Criteria. Specifically, the source is the City of San Diego Water Department Facility Design Guidelines Book 2.

For all land use categories, the water use factors are in gallons per day per net acre (gpd/net-ac). The residential unit water demand is 150 gpd per person. Persons per net-acre for residential land use varies depending on residential density. Each residential area of the Specific Plan was analyzed under the maximum possible density per the land use plan in Appendix A and then a population density per "Table 2-1" in Book 2 was applied.

TABLE 1
SOUTHWEST VILLAGE WATER DEMAND

Land Use Area	Proposed Land Use	Net Density	Net Acreage	Water Use Factor, gpd/net-ac.	Demand		
					gpd	mgd	ac-ft/yr
1	Medium Density	29.0	5.5	13,050	71,775	0.072	80
2	Park	0.0	4.0	4,680	18,720	0.019	21
3	Park	0.0	1.7	4,680	7,956	0.008	9
4	Medium Density	29.0	7.3	13,050	95,265	0.095	107
5	Medium Density	29.0	21.0	13,050	274,050	0.274	307
6	Medium Density	28.9	3.6	13,050	46,980	0.047	53
7	Medium Density	29.0	5.5	13,050	71,775	0.072	80
8	Medium-High Density	44.1	6.4	16,800	107,520	0.108	120
9	Medium Density	29.1	3.7	13,050	48,285	0.048	54
10	Medium-Low Density	22.0	10.2	10,110	103,122	0.103	116
11	Medium Density	29.0	6.6	13,050	86,130	0.086	96
12	Medium-Low Density	22.0	6.2	10,110	62,682	0.063	70
13	Medium Density	29.1	6.6	13,050	86,130	0.086	96
14	Medium-Low Density	22.0	8.2	10,110	82,902	0.083	93
15	Medium-Low Density	22.0	11.0	10,110	111,210	0.111	125
16	School	0.0	5.0	4,680	23,400	0.023	26
17	Park	0.0	8.4	4,680	39,312	0.039	44
18	Medium-Low Density	22.0	10.8	10,110	109,188	0.109	122
19	Medium Density	29.0	8.2	13,050	107,010	0.107	120
20	Medium-Low Density	22.0	6.1	10,110	61,671	0.062	69
21	Medium-Low Density	22.0	12.1	10,110	122,331	0.122	137
22	Medium Density	29.0	9.2	13,050	120,060	0.120	134
23	Open Space/VPHCP	0	6.2	0	0	0	0
24	Residential Mixed-Use	56.8	6.2	20,475	126,945	0.127	142
25	Residential Mixed-Use	57.0	6.4	20,475	131,040	0.131	147
26	Residential Mixed-Use	56.8	4.4	20,475	90,090	0.090	101
27	Residential Mixed-Use	57.6	3.8	20,475	77,805	0.078	87
28	Open Space	0.0	102.5	0.0	0	0	0

TABLE 1
SOUTHWEST VILLAGE WATER DEMAND

Land Use Area	Proposed Land Use	Net Density	Net Acreage	Water Use Factor, gpd/net-ac.	Demand		
					gpd	mgd	ac-ft/yr
29	Open Space/MHPA	0.0	2.6	0.0	0	0	0
30	VPHCP	0.0	41.3	0.0	0	0	0
31	VPHCP (Pump Station)	0.0	3.7	0.0	0	0	0
32	Streets	0.0	45.6	0.0	0	0	0
TOTAL					**2,283,354**	**2.283**	**2,558**
TOTAL – PER UNIT (5,130 Units)					**445**	**--**	**0.5**

From the City of San Diego Department Facility Design Guidelines Book 2, Figure 2-2, the maximum day demand to average annual demand ratio is approximately 1.5 based on the RS Residential peaking curve, resulting in an estimated maximum day demand in the pressure zone of 3,425,031 gpd (2,378 gpm).

From the City of San Diego Department Facility Design Guidelines Book 2, Figure 2-1, the peak hour demand to average annual demand ratio is approximately 3 based on the RS Residential peaking curve, resulting in an estimated peak hour demand of 6,850,062 gpd (4,757 gpm).

These are equivalent to a maximum day demand of 0.46 gpm per Southwest Village unit and a peak hour demand of 0.93 gpm per Southwest Village unit.

Existing 680 Zone Capacity – Ocean View Hills Pump Station

Presently the 680 Zone is only supplied by one of the three planned booster pump stations. Ocean View Hills Pump Station, located along Ocean View Hills Parkway approximately a half mile east of Dennery Road and 3,500 feet east of Interstate 805, is the sole pump station currently providing 680 Zone water service. This booster station was placed into service in 2001 as part of the previous California Terraces development project.

Per the City's Pump Station Data Sheet, the pumping capacity for Ocean View Hills Pump Station is stated as 5,500 gpm. A copy of the City's Pump Station Data Sheet for Ocean View Hills Pump Station is included as Attachment B.

Water meter data from Ocean View Hills Pump Station was provided by the City. Peak flow rates out of the pump station were measured to be 1,188 gpm for a maximum day demand condition and 2,195 gpm for a peak hour demand condition. A copy of the City's water meter flow data for Ocean View Hills Pump Station is included as Attachment C.

The existing hydraulic capacity at Ocean View Hills Pump Station and the 680 Zone is shown in detail below.

- Peak Hour Capacity = 5,500 gpm (station capacity) – 2,195 gpm (existing peak hour demand) = **3,305 gpm**
- Maximum Day Demand plus 1,500 gpm Single Family Residential Fire Flow Capacity = 5,500 gpm (station capacity) – 2,688 gpm (existing maximum day demand + 1,500 gpm fire flow) = **2,812 gpm**
- Maximum Day Demand plus 3,000 gpm Multi Family Residential Fire Flow Capacity = 5,500 gpm (station capacity) – 4,188 gpm (existing maximum day demand + 1,500 gpm fire flow) = **1,312 gpm**

Converting these respective hydraulic capacities into Southwest Village units must consider the estimated water demands presented in Table 1 as well as the maximum day demand of 0.46 gpm per Southwest Village unit and a peak hour demand of 0.93 gpm per Southwest Village unit. The hydraulic capacities converted to Southwest Village units are shown below.

- Peak Hour Capacity = 3,305 gpm **= 3,554 units**
- Maximum Day Demand plus 1,500 gpm Single Family Residential Fire Flow Capacity = 2,812 gpm **= 6,113 units**
- Maximum Day Demand plus Multi Family Residential 3,000 gpm Fire Flow Capacity = 1,312 gpm **= 2,852 units**

The remaining capacity in the 680 Zone amounts to 2,852 units under the most conservative current demand condition. There are several approved projects located within the 680 Zone

that are yet to be constructed and occupied. These approved projects need to be accounted for when assessing 680 Zone capacity. These approved projects are listed below in Table 2.

TABLE 2
APPROVED PROJECTS TO BE CONSTRUCTED AND OCCUPIED IN THE 680 ZONE

Project Name	Proposed Dwelling Units
La Brisa/CA Terraces PA-61	282
BDM Mixed Use	430
Candlelight	450
TOTAL	**1,162**

Subtracting the approved units presented in Table 2 from the 2,852 units remaining hydraulic capacity in the 680 Zone results in a 1,690-unit net hydraulic capacity for the 680 Zone.

Water System Computer Model

The University of Kentucky KYPIPE computer program was used to conduct a hydraulic model of the proposed water system within the 800 unit Phase 1 study area. This computer program utilizes the Hazen-Williams equation for determining headloss in pipes; the Hazen-Williams "C" value used for all pipes is 120.

The computer model for this study includes the proposed initial 680 Pressure Zone transmission main piping, the proposed public onsite Phase 1 water distribution system piping, and both redundant 16-inch diameter supply alternatives stemming from Caliente Avenue modeled independently. Figure 2 in Appendix A presents the recommended Specific Plan phased onsite public water system configuration and pipe sizing. The water supply source node for the computer model is at the Ocean View Hills Pump Station set for a hydraulic grade line of 680 feet.

For existing land uses within the 680 Pressure Zone, water meter data from the Ocean View Hills Pump Station was obtained from the City of San Diego Public Utilities Department and utilized and incorporated into the hydraulic model as average existing water demand for the developed areas of the 680 Pressure Zone. The approved projects listed in Table 2 were included as well.

The proposed public water lines within the Southwest Village plan which are incorporated into the hydraulic computer model consist of the backbone system configuration. Water distribution systems internal to individual planning areas are not built into the model at this time. As the Southwest Village Specific Plan progresses, specific water studies for individual planning areas will be completed.

Water System Analysis and Results

Appendix D presents the computer modeling results. Exhibit A at the back of Appendix D presents the corresponding Node and Pipe Diagram.

The planning-level multi-family fire flow guideline of 3,000 gpm was modeled at the furthest point of the phased site. A pipe break scenario was modeled which consists of only one proposed 16-inch diameter water line in Caliente Avenue, Central Avenue, and West Avenue. A pipe break scenario was analyzed in order to adequately assess the proposed onsite water system's capability under each alternative.

Under normal operating and pipe break conditions the planning-level fire flow of 3,000 gpm is being met with a minimum residual pressure of greater than 52 psi onsite, 49 psi throughout the pressure zone, and a maximum pipeline velocity of 5.9 fps.

The results of the computer hydraulic analyses for the Southwest Village VTM 1 Addendum No. 1 indicate that the existing and proposed Phase 1 water system can provide sufficient flow and pressure for the Southwest Village phased domestic and projected fire protection service needs.

Conclusions and Recommendations

The following conclusions and recommendations are summarized based on this Addendum No. 1 water study prepared for the Southwest Village VTM 1.

1. Water service to the initial 800 unit phase of Southwest Village will be supplied by the City of San Diego from the Otay Mesa 680 Pressure Zone system.

2. Maximum static pressures within Southwest Village will range between 70 psi and 90 psi.

3. A maximum day demand plus 3,000 gpm fire flow scenario can be met within the initial phase of Southwest Village with all residual pressures greater than 20 psi and pipeline velocities less than 15 fps under an all-pipes-open scenario as well as under a pipe break scenario.

4. Figure 2 in Appendix A presents the recommended Phase 1 onsite public water system configuration and pipe sizing.

5. Offsite water distribution system improvements necessary to provide water service to Southwest Village VTM 1 and pertinent phasing comprises of extending 16-inch water mains in Caliente Avenue south into the Southwest Village area.

6. The 16-inch water mains will run parallel in Central Avenue, Beyer Boulevard, and West Avenue. All connections services, hydrants, etc. will be placed on the western parallel line. The eastern parallel line will be temporary and will be abandoned in Central Avenue and Beyer Boulevard once the western connection pipeline via Beyer Boulevard is completed, and there will be no connections on this temporary eastern parallel line.

7. The existing hydraulic capacity for the Ocean View Hills Pump Station and the corresponding 680 Zone is shown to be approximately 2,852 units based on the most restrictive and conservative demand condition presented in this study. Note there are approximately 1,162 approved units that have yet to be constructed and fully developed/occupied within the 680 Zone. This would reduce the net hydraulic capacity

for Ocean View Hills Pump Station and the corresponding 680 Zone down to approximately 1,690 units.

8. The net hydraulic capacity for the 680 Zone down of 1,690 units is sufficient to supply the proposed 800 unit Phase 1 for Southwest Village VTM 1.

9. As development progresses in the 680 Zone the water meter data from Ocean View Hills Pump Station should continue to be monitored to confirm assumed future water demands and hydraulic capacity.

10. One vesting tentative map is under design development as the initial phase of the Southwest Village Specific Plan.

11. This report presents the sizing and a general schematic layout of the proposed public water system. The water improvements design engineer should incorporate valves, fittings, and appurtenances as needed and in accordance with the City of San Diego design standards for proper installation and long-term operation of the water system.

12. Due to the elevation of the Southwest Village site, pressure regulators must be installed below an elevation of 496 feet in order to comply with the California Plumbing Code which limits pressure inside a building to a maximum of 80 psi.

13. All water improvements will be in accordance with the City of San Diego's current design standards.

14. PVC pipe used for the public water pipelines (8-inch through 16-inch diameter piping) shall be AWWA C900 DR 18 Class 235.

15. If any water lines to be constructed by this development are metallic, a California Licensed Corrosion Engineer will be required to perform a soil corrosivity study and to design a Corrosion Control System.

If you have any questions regarding the information or conclusions and recommendations presented in this report, please do not hesitate to call.

Dexter Wilson Engineering, Inc.

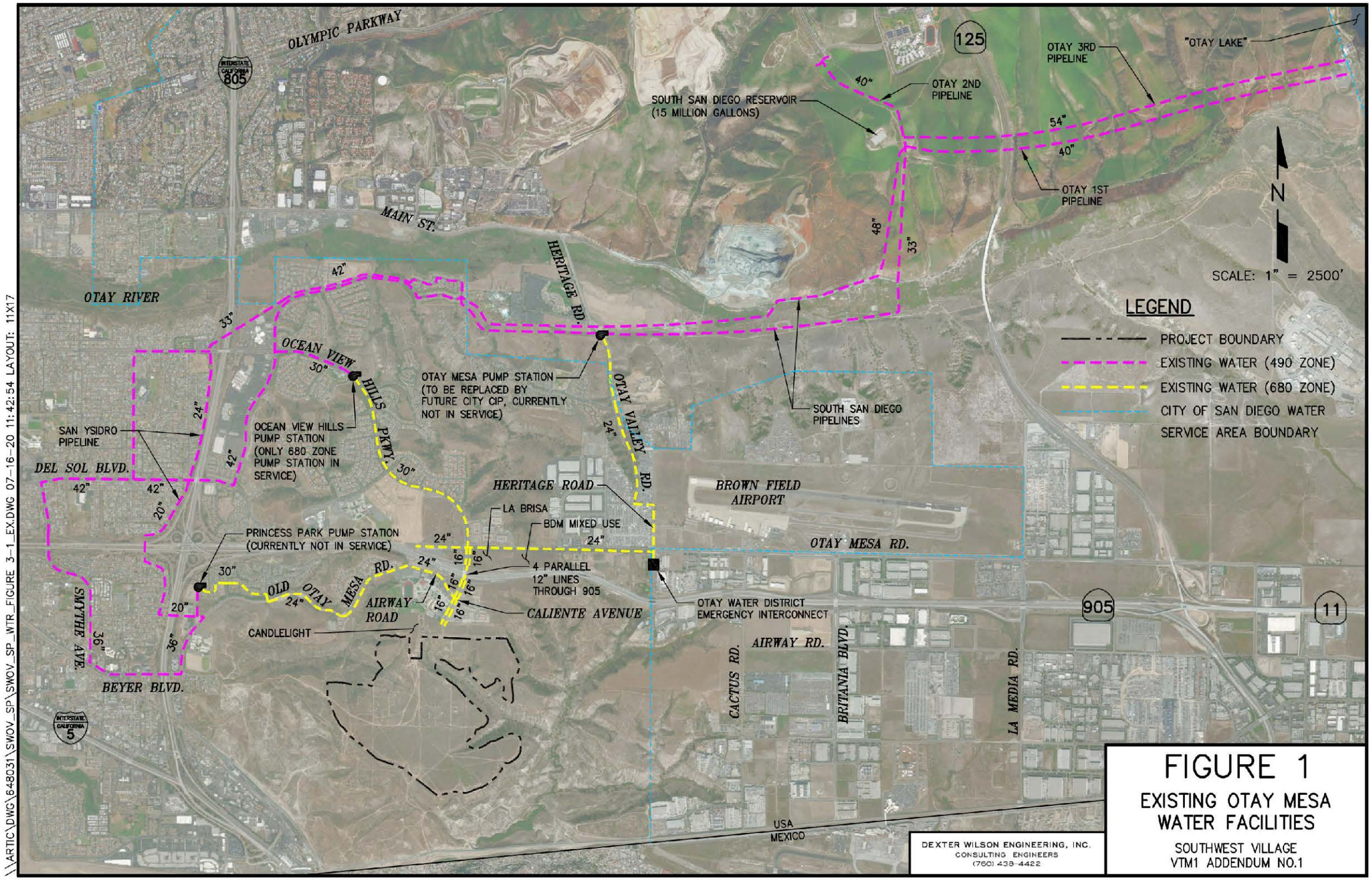
Steven Henderson, P.E.

SH:ah

Attachments

APPENDIX A

EXISTING 680 ZONE OTAY MESA WATER FACILITIES (FIGURE 1) AND PROPOSED PHASE WATER SYSTEM (FIGURE 2)



\\ARTIC\DWG\648031\SWOV_SP\SWOV_SP_WTR_FIGURE 3-1_EX.DWG 07-16-20 11:42:54 LAYOUT: 11X17

FIGURE 1

EXISTING OTAY MESA WATER FACILITIES

SOUTHWEST VILLAGE
VTM1 ADDENDUM NO.1

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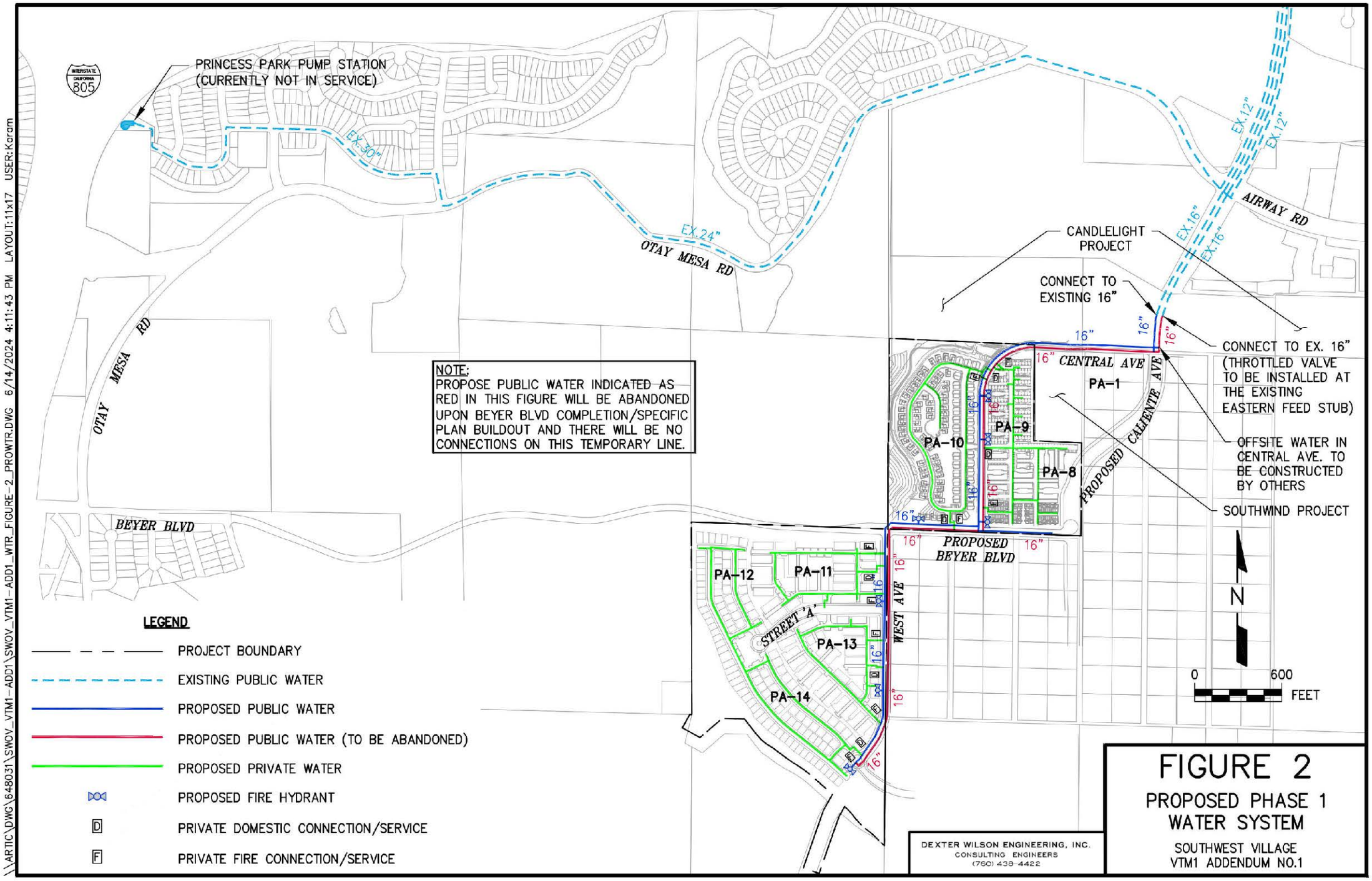

FIGURE 2

PROPOSED PHASE 1 WATER SYSTEM

SOUTHWEST VILLAGE
VTM1 ADDENDUM NO.1

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\\ARTIC\DWG\648031\SWOV_VTM1-ADD1\SWOV_VTM1-ADD1_WTR_FIGURE-2_PROWTR.DWG 6/14/2024 4:11:43 PM LAYOUT:11x17 USER:Karam

APPENDIX B

CITY OF SAN DIEGO PUMP STATION DATA SHEET FOR OCEAN VIEW HILLS PUMP STATION

PUMP STATION DATA SHEET

REVISED: 5-22-01 PER SCADA, Jesus Ramos

PS and address: OceanView Hills, 4927 OceanView Hills Pkwy
Discharge Elev: 397.0 FT
Suction Elev: 388.0 FT
Gate book Page: N34S
Number of pumps: 3, VFD

Pump Capacities: (GPM/HP) 1 1000/100 2 1000/100 3 3500/350
4 _____ 5 _____ 6 _____

# of Pumps That Run at the Same Time: 3
Pump Suction From: South San Diego 490 Zone
Pump Discharge To: Otay Mesa 680 zone

Normal Station Discharge Pressure: 130 psi (697 HGL)
Normal Station Suction Pressure: 25 psi (446 HGL)
Low Suction Pressure Cut Off: 5 psi (400 HGL)
High Discharge Pressure Cut Off: 145 psi (732 HGL)
Pressure relief valve set at 143 psi, up from 141 psi

1.Control System Description

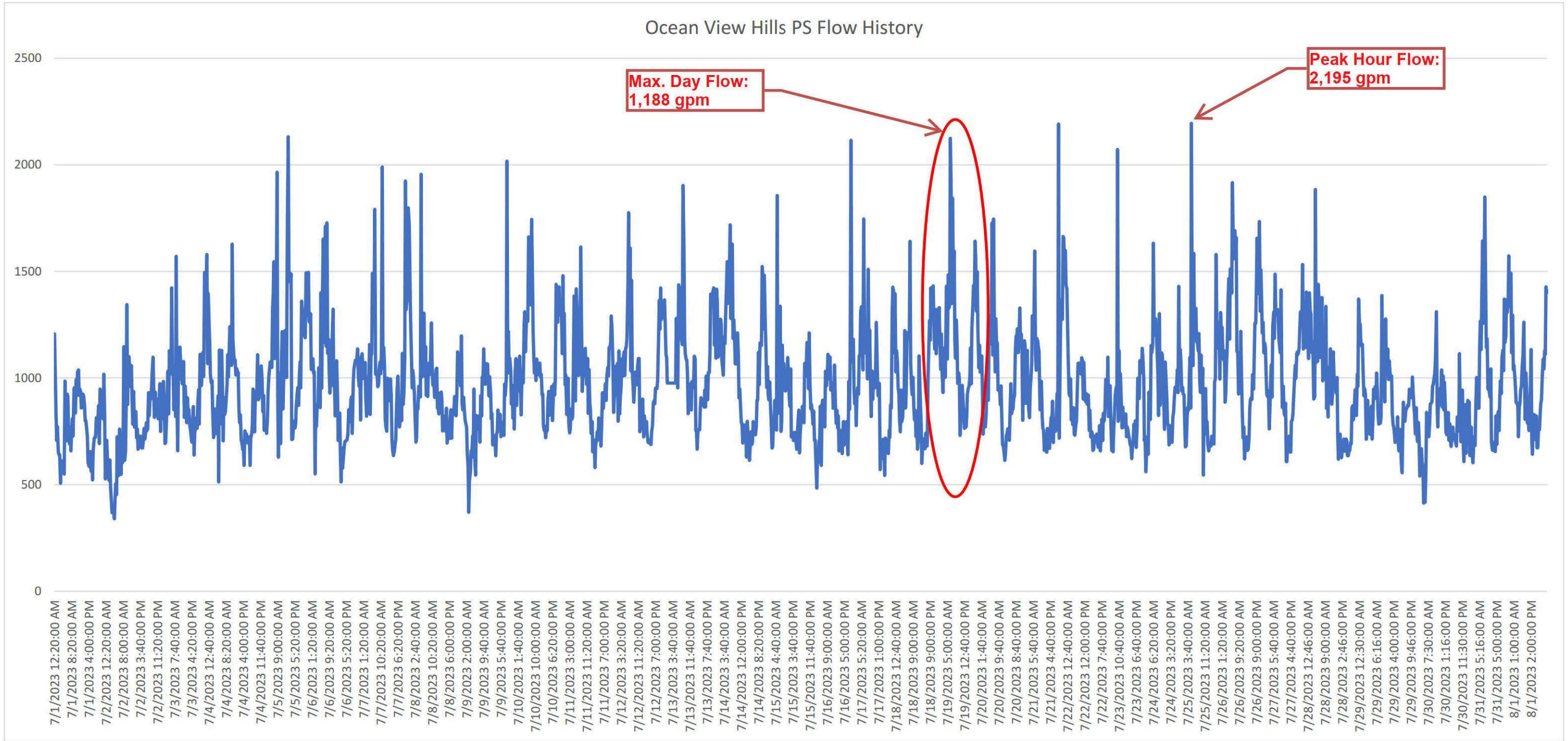
Pressure control mode: The PLC Shall start, stop and control the speed of pumps to achieve the following operation:

1. Rising Discharge Flow

Discharge Flow	Pumps Operation :
Less than 400 gpm	Lead 100 hp pump running at variable speed to maintain the sum of the discharge flow and recirculation flow at 400 gpm
Between 400 and 1000 gpm	Lead 100 hp pump running at variable speed to maintain set point pressure in discharge header
Between 1000 and 2000 gpm	Lead and lag 100hp pumps, both running at the same variable speed to maintain set point pressure in discharge header.
Between 2000 and 3500 gpm	One 350 hp pump running at variable speed to maintain pressure in discharge header
Between 3500 and 4500 gpm	Lead 100hp pump running at full speed, one 350 hp pump running at variable speed to maintain set point pressure in discharge header
Greater than 4500 gpm	Lead and lag 100 hp pump, both running at full speed, one 350 hp running at variable speed to maintain set pont pressure in discharge header

APPENDIX C

CITY OF SAN DIEGO WATER METER FLOW DATA FOR OCEAN VIEW HILLS PUMP STATION


Ocean View Hills PS Flow History
Max. Day Flow:
1,188 gpm
Peak Hour Flow:
2,195 gpm
2500
2000
1500
1000
500
0
7/1/2023 12:20:00 AM
7/1/2023 8:20:00 AM
7/1/2023 4:00:00 PM
7/2/2023 12:20:00 AM
7/2/2023 8:00:00 AM
7/2/2023 3:40:00 PM
7/2/2023 11:20:00 PM
7/3/2023 7:40:00 AM
7/3/2023 4:20:00 PM
7/4/2023 12:40:00 AM
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7/24/2023 3:20:00 PM
7/25/2023 3:40:00 AM
7/25/2023 11:20:00 AM
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7/26/2023 9:20:00 AM
7/26/2023 9:00:00 PM
7/27/2023 5:40:00 AM
7/27/2023 4:40:00 PM
7/28/2023 12:46:00 AM
7/28/2023 9:00:00 AM
7/28/2023 2:46:00 PM
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APPENDIX D

COMPUTER MODELING OUTPUT

The following conditions were modeled under phased buildout of Southwest Village (Reference Exhibit A at back of Appendix D for Corresponding Node and Pipe Diagram):

1. Average Day Demand.

2. Peak Hour Demand.

3. Maximum Day Demand plus 1,500 gpm at Node 43

4. Maximum Day Demand plus 3,000 gpm Fire Flow at Node 36

5. Maximum Day Demand plus 3,000 gpm at Node 42

6. Maximum Day Demand plus 3,000 gpm at Node 42, Pipe Break (Pipe 51 Closed)

Project: Southwest Village Project - Specific Plan Addendum No. 1
Date: 10/19/2023
Job Number: 648-031

Scenario: Average Day Demand

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
J-4	521	680	68.89	68.76	0.13
J-5	470	680	90.99	89.95	1.04
J-8	534	680	63.26	62.63	0.63
J-24	550	680	56.33	55.58	0.75
J-28	488	680	83.19	82.26	0.93
J-29	483	680	85.36	84.38	0.98
J-32	516	680	71.06	70.28	0.78
J-36	482	680	85.79	84.77	1.02
J-40	475	680	88.82	87.8	1.02
J-41	483	680	85.36	84.31	1.05
J-42	490	680	82.32	81.27	1.05
J-43	495	680	80.16	79.1	1.06

Project: Southwest Village Project - Specific Plan Addendum No. 1
Date: 10/19/2023
Job Number: 648-031

Scenario: Peak Hour Demand

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
J-4	521	680	68.89	68.08	0.81
J-5	470	680	90.99	84.05	6.94
J-8	534	680	63.26	59.46	3.80
J-24	550	680	56.33	51.67	4.66
J-28	488	680	83.19	77.11	6.08
J-29	483	680	85.36	78.88	6.48
J-32	516	680	71.06	66.13	4.93
J-36	482	680	85.79	79.01	6.78
J-40	475	680	88.82	82.05	6.77
J-41	483	680	85.36	78.35	7.01
J-42	490	680	82.32	75.26	7.06
J-43	495	680	80.16	73.09	7.07

Project: Southwest Village Project - Specific Plan Addendum No. 1
Date: 10/19/2023
Job Number: 648-031

Scenario: Maximum Day Demand plus 1,500 gpm Single Family Fire Flow at Node 43

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
J-4	521	680	68.89	68.35	0.54
J-5	470	680	90.99	82.48	8.51
J-8	534	680	63.26	60.7	2.56
J-24	550	680	56.33	52.86	3.47
J-28	488	680	83.19	77.09	6.10
J-29	483	680	85.36	78.39	6.97
J-32	516	680	71.06	67.09	3.97
J-36	482	680	85.79	78.04	7.75
J-40	475	680	88.82	81.08	7.74
J-41	483	680	85.36	76.32	9.04
J-42	490	680	82.32	72.58	9.74
J-43	495	680	80.16	70.08	10.08

Project: Southwest Village Project - Specific Plan Addendum No. 1
Date: 10/19/2023
Job Number: 648-031

Scenario: Maximum Day Demand plus 3,000 gpm Multi Family Fire Flow at Node 36

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
J-4	521	680	68.89	67.89	1.00
J-5	470	680	90.99	72.72	18.27
J-8	534	680	63.26	58.58	4.68
J-24	550	680	56.33	49.6	6.73
J-28	488	680	83.19	69.53	13.66
J-29	483	680	85.36	69.36	16.00
J-32	516	680	71.06	63.02	8.04
J-36	482	680	85.79	66.6	19.19
J-40	475	680	88.82	70.6	18.22
J-41	483	680	85.36	67.06	18.30
J-42	490	680	82.32	64.02	18.30
J-43	495	680	80.16	61.85	18.31

Project: Southwest Village Project - Specific Plan Addendum No. 1
Date: 10/19/2023
Job Number: 648-031

Scenario: Maximum Day Demand plus 3,000 gpm Multi Family Fire Flow at Node 42

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
J-4	521	680	68.89	67.89	1.00
J-5	470	680	90.99	70.42	20.57
J-8	534	680	63.26	58.58	4.68
J-24	550	680	56.33	49.6	6.73
J-28	488	680	83.19	69.53	13.66
J-29	483	680	85.36	69.36	16.00
J-32	516	680	71.06	63.02	8.04
J-36	482	680	85.79	67.56	18.23
J-40	475	680	88.82	70.6	18.22
J-41	483	680	85.36	63.09	22.27
J-42	490	680	82.32	57.63	24.69
J-43	495	680	80.16	55.46	24.70

Project: Southwest Village Project - Specific Plan Addendum No. 1
Date: 10/19/2023
Job Number: 648-031

Scenario: Maximum Day Demand plus 3,000 gpm Multi Family Fire Flow at Node 42
Pipe Break (Pipe 51 Closed)

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi
J-4	521	680	68.89	67.89
J-5	470	680	90.99	66.99
J-8	534	680	63.26	58.58
J-24	550	680	56.33	49.6
J-28	488	680	83.19	66.1
J-29	483	680	85.36	65.92
J-32	516	680	71.06	59.59
J-36	482	680	85.79	64.13
J-40	475	680	88.82	67.17
J-41	483	680	85.36	59.66
J-42	490	680	82.32	54.2
J-43	495	680	80.16	52.03

Project: Southwest Village Project - Specific Plan Addendum No. 1
Date: 10/19/2023
Job Number: 648-031

Scenario: Average Day Demand

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	30	1847.4	0.84
6	16	195.9	0.31
11	24	1847.4	1.31
31	12	220.35	0.63
35	12	220.35	0.63
39	12	220.35	0.63
43	12	220.35	0.63
51	16	261.2	0.42
55	16	261.2	0.42
62	16	457.1	0.73
63	16	522.4	0.83
65	16	261.2	0.42
66	16	391.8	0.63
67	16	130.6	0.21
68	16	65.3	0.1
85	16	65.3	0.1

Project: Southwest Village Project - Specific Plan Addendum No. 1
Date: 10/19/2023
Job Number: 648-031

Scenario: Peak Hour Demand

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	30	4839.2	2.2
6	16	587.7	0.94
11	24	4839.2	3.43
31	12	661.05	1.88
35	12	661.05	1.88
39	12	661.05	1.88
43	12	661.05	1.88
51	16	783.6	1.25
55	16	783.6	1.25
62	16	1371.3	2.19
63	16	1567.2	2.5
65	16	783.6	1.25
66	16	1175.4	1.88
67	16	391.8	0.63
68	16	195.9	0.31
85	16	195.9	0.31

Project: Southwest Village Project - Specific Plan Addendum No. 1
Date: 10/19/2023
Job Number: 648-031

Scenario: Maximum Day Demand plus 1,500 gpm Single Family Fire Flow at Node 43

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	30	3912.15	1.78
6	16	1695.9	2.71
11	24	3912.15	2.77
31	12	681.04	1.93
35	12	681.04	1.93
39	12	681.04	1.93
43	12	681.04	1.93
51	16	1092.82	1.74
55	16	1092.82	1.74
62	16	2087.7	3.33
63	16	2185.65	3.49
65	16	1793.85	2.86
66	16	1989.75	3.17
67	16	1597.95	2.55
68	16	1500	2.39
85	16	97.95	0.16

Project: Southwest Village Project - Specific Plan Addendum No. 1
Date: 10/19/2023
Job Number: 648-031

Scenario: Maximum Day Demand plus 3,000 gpm Multi Family Fire Flow at Node 36

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	30	5412.15	2.46
6	16	293.85	0.47
11	24	5412.15	3.84
31	12	1056.04	3
35	12	1056.04	3
39	12	1056.04	3
43	12	1056.04	3
51	16	1842.82	2.94
55	16	1842.82	2.94
62	16	3587.7	5.72
63	16	3685.65	5.88
65	16	391.8	0.63
66	16	3489.75	5.57
67	16	195.9	0.31
68	16	97.95	0.16
85	16	3000	4.79

Project: Southwest Village Project - Specific Plan Addendum No. 1
Date: 10/19/2023
Job Number: 648-031

Scenario: Maximum Day Demand plus 3,000 gpm Multi Family Fire Flow at Node 42

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	30	5412.15	2.46
6	16	3195.9	5.1
11	24	5412.15	3.84
31	12	1056.04	3
35	12	1056.04	3
39	12	1056.04	3
43	12	1056.04	3
51	16	1842.82	2.94
55	16	1842.82	2.94
62	16	3587.7	5.72
63	16	3685.65	5.88
65	16	3293.85	5.26
66	16	3489.75	5.57
67	16	3097.95	4.94
68	16	97.95	0.16
85	16	97.95	0.16

Project: Southwest Village Project - Specific Plan Addendum No. 1
Date: 10/19/2023
Job Number: 648-031

Scenario: Maximum Day Demand plus 3,000 gpm Multi Family Fire Flow at Node 42
Pipe Break (Pipe 51 Closed)

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
1	30	5412.15	2.46
6	16	3195.9	5.1
11	24	5412.15	3.84
31	12	1056.04	4.72
35	12	1056.04	3
39	12	1056.04	3
43	12	1056.04	3
51	16	PIPE CLOSED	
55	16	3685.65	5.88
62	16	3587.7	5.72
63	16	3685.65	5.88
65	16	3293.85	5.26
66	16	3489.75	5.57
67	16	3097.95	4.94
68	16	97.95	0.16
85	16	97.95	0.16

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* * * * * * * * * * * * K Y P I P E * * * * * * * * * * * *
*                                                           *
*  Pipe Network Modeling Software                           *

*  CopyRighted by KYPIPE LLC (www.kypipe.com)               *
*  Version: 10.009  10/01/2019                              *
   Company:  Dexter        Serial #:  592169
*  Interface:  Classic                                      *
*  Licensed for Pipe2018                                    *
*                                                           *
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Date & Time: Thu Oct 19 13:46:55 2023

Master File : \\artic\eng\648031\oct 2023 sw village vtm 1 addendum 1 680 zone.KYP\oct 2023 sw village vtm 1 addendum 1 680 zone.P2K

S U M M A R Y O F O R I G I N A L D A T A

U N I T S S P E C I F I E D

FLOWRATE ..... gallons/minute
HEAD (HGL) ..... feet
PRESSURE ..... psig

P I P E L I N E D A T A

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

P I P E N A M E	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-1	0 - OVHPS	J-4	3000.00	30.00	120.0000	0.00
P-6	J-5	J-41	630.00	16.00	120.0000	0.00
P-11	J-4	J-8	3700.00	24.00	120.0000	0.00
P-31	J-8	J-24	1450.00	12.00	120.0000	0.00
P-35	J-8	J-24	1450.00	12.00	120.0000	0.00
P-39	J-8	J-24	1450.00	12.00	120.0000	0.00
P-43	J-8	J-24	1450.00	12.00	120.0000	0.00
P-51	J-24	J-32	1350.00	16.00	120.0000	0.00
P-55	J-24	J-32	1350.00	16.00	120.0000	0.00
P-62	J-28	J-29	700.00	16.00	120.0000	0.00
P-63	J-32	J-28	1600.00	16.00	120.0000	0.00
P-65	J-40	J-5	820.00	16.00	120.0000	0.00
P-66	J-29	J-40	700.00	16.00	120.0000	0.00
P-67	J-41	J-42	950.00	16.00	120.0000	0.00
P-68	J-42	J-43	500.00	16.00	120.0000	0.00
P-85	J-40	J-36	400.00	16.00	120.0000	0.00

N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
0 - OVHPS		----	0.00	680.00
J-4		0.00	521.00	
J-5		65.30	470.00	
J-8		966.00	534.00	
J-24		359.00	550.00	
J-28		65.30	488.00	
J-29		65.30	483.00	
J-32		0.00	516.00	
J-36		65.30	482.00	
J-40		65.30	475.00	
J-41		65.30	483.00	
J-42		65.30	490.00	
J-43		65.30	495.00	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT
MAXIMUM AND MINIMUM PRESSURES = 3
MAXIMUM AND MINIMUM VELOCITIES = 3

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(P) = 16
NUMBER OF END NODES .....(J) = 12
NUMBER OF PRIMARY LOOPS .....(L) = 4
NUMBER OF SUPPLY NODES .....(F) = 1
NUMBER OF SUPPLY ZONES .....(Z) = 1

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Case: 1

C H A N G E S F O R N E X T S I M U L A T I O N (Change Number = 1)

Average Day Demand

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

RESULTS OBTAINED AFTER 3 TRIALS: ACCURACY = 0.00000E+00

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
P-1	0 - OVHPS	J-4	1847.40	0.32	0.00	0.84	0.11	0.11
P-6	J-5	J-41	195.90	0.02	0.00	0.31	0.04	0.04
P-11	J-4	J-8	1847.40	1.16	0.00	1.31	0.31	0.31
P-31	J-8	J-24	220.35	0.26	0.00	0.63	0.18	0.18

P-35	J-8	J-24	220.35	0.26	0.00	0.63	0.18	0.18
P-39	J-8	J-24	220.35	0.26	0.00	0.63	0.18	0.18
P-43	J-8	J-24	220.35	0.26	0.00	0.63	0.18	0.18
P-51	J-24	J-32	261.20	0.08	0.00	0.42	0.06	0.06
P-55	J-24	J-32	261.20	0.08	0.00	0.42	0.06	0.06
P-62	J-28	J-29	457.10	0.12	0.00	0.73	0.17	0.17
P-63	J-32	J-28	522.40	0.35	0.00	0.83	0.22	0.22
P-65	J-40	J-5	261.20	0.05	0.00	0.42	0.06	0.06
P-66	J-29	J-40	391.80	0.09	0.00	0.63	0.13	0.13
P-67	J-41	J-42	130.60	0.02	0.00	0.21	0.02	0.02
P-68	J-42	J-43	65.30	0.00	0.00	0.10	0.00	0.00
P-85	J-40	J-36	65.30	0.00	0.00	0.10	0.00	0.00

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
0 - OVHPS		----	680.00			
J-4		0.00	679.68	521.00	158.68	68.76
J-5		65.30	677.58	470.00	207.58	89.95
J-8		966.00	678.52	534.00	144.52	62.63
J-24		359.00	678.26	550.00	128.26	55.58
J-28		65.30	677.83	488.00	189.83	82.26
J-29		65.30	677.72	483.00	194.72	84.38
J-32		0.00	678.18	516.00	162.18	70.28
J-36		65.30	677.62	482.00	195.62	84.77
J-40		65.30	677.63	475.00	202.63	87.80
J-41		65.30	677.55	483.00	194.55	84.31
J-42		65.30	677.54	490.00	187.54	81.27
J-43		65.30	677.54	495.00	182.54	79.10

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
J-5	89.95	J-24	55.58
J-40	87.80	J-8	62.63
J-36	84.77	J-4	68.76

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-11	1.31	P-68	0.10
P-1	0.84	P-85	0.10
P-63	0.83	P-67	0.21

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
0 - OVHPS	1847.40	

NET SYSTEM INFLOW = 1847.40
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 1847.40

==========

Case: 2

C H A N G E S F O R N E X T S I M U L A T I O N (Change Number = 2)

Peak Hour Demand

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

RESULTS OBTAINED AFTER 3 TRIALS: ACCURACY = 0.42810E-08

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
P-1	0 - OVHPS	J-4	4839.20	1.89	0.00	2.20	0.63	0.63
P-6	J-5	J-41	587.70	0.17	0.00	0.94	0.27	0.27
P-11	J-4	J-8	4839.20	6.90	0.00	3.43	1.87	1.87
P-31	J-8	J-24	661.05	1.98	0.00	1.88	1.37	1.37
P-35	J-8	J-24	661.05	1.98	0.00	1.88	1.37	1.37
P-39	J-8	J-24	661.05	1.98	0.00	1.88	1.37	1.37
P-43	J-8	J-24	661.05	1.98	0.00	1.88	1.37	1.37
P-51	J-24	J-32	783.60	0.62	0.00	1.25	0.46	0.46
P-55	J-24	J-32	783.60	0.62	0.00	1.25	0.46	0.46
P-62	J-28	J-29	1371.30	0.91	0.00	2.19	1.30	1.30
P-63	J-32	J-28	1567.20	2.66	0.00	2.50	1.67	1.67
P-65	J-40	J-5	783.60	0.38	0.00	1.25	0.46	0.46
P-66	J-29	J-40	1175.40	0.68	0.00	1.88	0.98	0.98
P-67	J-41	J-42	391.80	0.12	0.00	0.63	0.13	0.13
P-68	J-42	J-43	195.90	0.02	0.00	0.31	0.04	0.04
P-85	J-40	J-36	195.90	0.01	0.00	0.31	0.04	0.04

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
0 - OVHPS		----	680.00			
J-4		0.00	678.11	521.00	157.11	68.08
J-5		195.90(3.00)	663.97	470.00	193.97	84.05
J-8		2195.00(2.27)	671.21	534.00	137.21	59.46
J-24		1077.00(3.00)	669.23	550.00	119.23	51.67
J-28		195.90(3.00)	665.94	488.00	177.94	77.11

J-29	195.90(3.00)	665.03	483.00	182.03	78.88
J-32	0.00	668.61	516.00	152.61	66.13
J-36	195.90(3.00)	664.34	482.00	182.34	79.01
J-40	195.90(3.00)	664.35	475.00	189.35	82.05
J-41	195.90(3.00)	663.80	483.00	180.80	78.35
J-42	195.90(3.00)	663.68	490.00	173.68	75.26
J-43	195.90(3.00)	663.66	495.00	168.66	73.09

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
J-5	84.05	J-24	51.67
J-40	82.05	J-8	59.46
J-36	79.01	J-32	66.13

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-11	3.43	P-68	0.31
P-63	2.50	P-85	0.31
P-1	2.20	P-67	0.63

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
0 - OVHPS	4839.20	

NET SYSTEM INFLOW = 4839.20
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 4839.20

==========

Case: 3

C H A N G E S F O R N E X T S I M U L A T I O N (Change Number = 3)

Maximum Day Demand plus 1,500 gpm at Node 43

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

RESULTS OBTAINED AFTER 3 TRIALS: ACCURACY = 0.00000E+00

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
P-1	0 - OVHPS	J-4	3912.15	1.27	0.00	1.78	0.42	0.42
P-6	J-5	J-41	1695.90	1.21	0.00	2.71	1.93	1.93
P-11	J-4	J-8	3912.15	4.65	0.00	2.77	1.26	1.26
P-31	J-8	J-24	681.04	2.09	0.00	1.93	1.44	1.44
P-35	J-8	J-24	681.04	2.09	0.00	1.93	1.44	1.44
P-39	J-8	J-24	681.04	2.09	0.00	1.93	1.44	1.44
P-43	J-8	J-24	681.04	2.09	0.00	1.93	1.44	1.44
P-51	J-24	J-32	1092.82	1.15	0.00	1.74	0.85	0.85
P-55	J-24	J-32	1092.82	1.15	0.00	1.74	0.85	0.85
P-62	J-28	J-29	2087.70	1.98	0.00	3.33	2.83	2.83
P-63	J-32	J-28	2185.65	4.93	0.00	3.49	3.08	3.08
P-65	J-40	J-5	1793.85	1.75	0.00	2.86	2.14	2.14
P-66	J-29	J-40	1989.75	1.81	0.00	3.17	2.59	2.59
P-67	J-41	J-42	1597.95	1.64	0.00	2.55	1.73	1.73
P-68	J-42	J-43	1500.00	0.77	0.00	2.39	1.54	1.54
P-85	J-40	J-36	97.95	0.00	0.00	0.16	0.01	0.01

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
0 - OVHPS		----	680.00			
J-4		0.00	678.73	521.00	157.73	68.35
J-5		97.95(1.50)	660.34	470.00	190.34	82.48
J-8		1188.00(1.23)	674.07	534.00	140.07	60.70
J-24		538.50(1.50)	671.98	550.00	121.98	52.86
J-28		97.95(1.50)	665.89	488.00	177.89	77.09
J-29		97.95(1.50)	663.91	483.00	180.91	78.39
J-32		0.00	670.83	516.00	154.83	67.09
J-36		97.95(1.50)	662.09	482.00	180.09	78.04
J-40		97.95(1.50)	662.10	475.00	187.10	81.08
J-41		97.95(1.50)	659.13	483.00	176.13	76.32
J-42		97.95(1.50)	657.49	490.00	167.49	72.58
J-43		1500.00(**)	656.72	495.00	161.72	70.08

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
J-5	82.48	J-24	52.86
J-40	81.08	J-8	60.70
J-29	78.39	J-32	67.09

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-63	3.49	P-85	0.16
P-62	3.33	P-51	1.74
P-66	3.17	P-55	1.74

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
0 - OVHPS	3912.15	

NET SYSTEM INFLOW = 3912.15
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 3912.15

==========

Case: 4

C H A N G E S F O R N E X T S I M U L A T I O N (Change Number = 4)

Maximum Day Demand plus 3,000 gpm Fire Flow at Node 36

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

RESULTS OBTAINED AFTER 3 TRIALS: ACCURACY = 0.00000E+00

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
P-1	0 - OVHPS	J-4	5412.15	2.32	0.00	2.46	0.77	0.77
P-6	J-5	J-41	293.85	0.05	0.00	0.47	0.07	0.07
P-11	J-4	J-8	5412.15	8.49	0.00	3.84	2.29	2.29
P-31	J-8	J-24	1056.04	4.72	0.00	3.00	3.25	3.25
P-35	J-8	J-24	1056.04	4.72	0.00	3.00	3.25	3.25
P-39	J-8	J-24	1056.04	4.72	0.00	3.00	3.25	3.25
P-43	J-8	J-24	1056.04	4.72	0.00	3.00	3.25	3.25
P-51	J-24	J-32	1842.82	3.03	0.00	2.94	2.25	2.25
P-55	J-24	J-32	1842.82	3.03	0.00	2.94	2.25	2.25
P-62	J-28	J-29	3587.70	5.40	0.00	5.72	7.72	7.72
P-63	J-32	J-28	3685.65	12.98	0.00	5.88	8.11	8.11
P-65	J-40	J-5	391.80	0.10	0.00	0.63	0.13	0.13
P-66	J-29	J-40	3489.75	5.13	0.00	5.57	7.33	7.33
P-67	J-41	J-42	195.90	0.03	0.00	0.31	0.04	0.04
P-68	J-42	J-43	97.95	0.00	0.00	0.16	0.01	0.01
P-85	J-40	J-36	3000.00	2.22	0.00	4.79	5.54	5.54

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
0 - OVHPS		----	680.00			
J-4		0.00	677.68	521.00	156.68	67.89
J-5		97.95(1.50)	637.81	470.00	167.81	72.72
J-8		1188.00(1.23)	669.19	534.00	135.19	58.58
J-24		538.50(1.50)	664.47	550.00	114.47	49.60
J-28		97.95(1.50)	648.45	488.00	160.45	69.53
J-29		97.95(1.50)	643.05	483.00	160.05	69.36
J-32		0.00	661.44	516.00	145.44	63.02
J-36		3000.00(**)	635.70	482.00	153.70	66.60
J-40		97.95(1.50)	637.92	475.00	162.92	70.60
J-41		97.95(1.50)	637.76	483.00	154.76	67.06
J-42		97.95(1.50)	637.73	490.00	147.73	64.02
J-43		97.95(1.50)	637.73	495.00	142.73	61.85

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
J-5	72.72	J-24	49.60
J-40	70.60	J-8	58.58
J-28	69.53	J-43	61.85

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-63	5.88	P-68	0.16
P-62	5.72	P-67	0.31
P-66	5.57	P-6	0.47

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
0 - OVHPS	5412.15	

NET SYSTEM INFLOW = 5412.15
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 5412.15

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Case: 5

C H A N G E S F O R N E X T S I M U L A T I O N (Change Number = 5)

Maximum Day Demand plus 3,000 gpm at Node 42

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

RESULTS OBTAINED AFTER 3 TRIALS: ACCURACY = 0.00000E+00

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
P-1	0 - OVHPS	J-4	5412.15	2.32	0.00	2.46	0.77	0.77
P-6	J-5	J-41	3195.90	3.93	0.00	5.10	6.23	6.23
P-11	J-4	J-8	5412.15	8.49	0.00	3.84	2.29	2.29
P-31	J-8	J-24	1056.04	4.72	0.00	3.00	3.25	3.25
P-35	J-8	J-24	1056.04	4.72	0.00	3.00	3.25	3.25
P-39	J-8	J-24	1056.04	4.72	0.00	3.00	3.25	3.25
P-43	J-8	J-24	1056.04	4.72	0.00	3.00	3.25	3.25
P-51	J-24	J-32	1842.82	3.03	0.00	2.94	2.25	2.25
P-55	J-24	J-32	1842.82	3.03	0.00	2.94	2.25	2.25
P-62	J-28	J-29	3587.70	5.40	0.00	5.72	7.72	7.72
P-63	J-32	J-28	3685.65	12.98	0.00	5.88	8.11	8.11
P-65	J-40	J-5	3293.85	5.40	0.00	5.26	6.59	6.59
P-66	J-29	J-40	3489.75	5.13	0.00	5.57	7.33	7.33
P-67	J-41	J-42	3097.95	5.59	0.00	4.94	5.88	5.88
P-68	J-42	J-43	97.95	0.00	0.00	0.16	0.01	0.01
P-85	J-40	J-36	97.95	0.00	0.00	0.16	0.01	0.01

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
0 - OVHPS		----	680.00			
J-4		0.00	677.68	521.00	156.68	67.89
J-5		97.95(1.50)	632.51	470.00	162.51	70.42
J-8		1188.00(1.23)	669.19	534.00	135.19	58.58
J-24		538.50(1.50)	664.47	550.00	114.47	49.60
J-28		97.95(1.50)	648.45	488.00	160.45	69.53
J-29		97.95(1.50)	643.05	483.00	160.05	69.36
J-32		0.00	661.44	516.00	145.44	63.02
J-36		97.95(1.50)	637.91	482.00	155.91	67.56
J-40		97.95(1.50)	637.92	475.00	162.92	70.60
J-41		97.95(1.50)	628.59	483.00	145.59	63.09
J-42		3000.00(**)	623.00	490.00	133.00	57.63
J-43		97.95(1.50)	623.00	495.00	128.00	55.46

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
J-40	70.60	J-24	49.60
J-5	70.42	J-43	55.46
J-28	69.53	J-42	57.63

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-63	5.88	P-68	0.16
P-62	5.72	P-85	0.16
P-66	5.57	P-1	2.46

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
0 - OVHPS	5412.15	

NET SYSTEM INFLOW = 5412.15
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 5412.15

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Case: 6

C H A N G E S F O R N E X T S I M U L A T I O N (Change Number = 6)

Maximum Day Demand plus 3,000 gpm at Node 42
Pipe Break (Pipe 51 Closed)

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Pipe P-51 is CLOSED

RESULTS OBTAINED AFTER 3 TRIALS: ACCURACY = 0.19156E-07

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
P-1	0 - OVHPS	J-4	5412.15	2.32	0.00	2.46	0.77	0.77
P-6	J-5	J-41	3195.90	3.93	0.00	5.10	6.23	6.23
P-11	J-4	J-8	5412.15	8.49	0.00	3.84	2.29	2.29
P-31	J-8	J-24	1056.04	4.72	0.00	3.00	3.25	3.25
P-35	J-8	J-24	1056.04	4.72	0.00	3.00	3.25	3.25
P-39	J-8	J-24	1056.04	4.72	0.00	3.00	3.25	3.25
P-43	J-8	J-24	1056.04	4.72	0.00	3.00	3.25	3.25

P-51-XX	J-24	J-32						
P-55	J-24	J-32	3685.65	10.95	0.00	5.88	8.11	8.11
P-62	J-28	J-29	3587.70	5.40	0.00	5.72	7.72	7.72
P-63	J-32	J-28	3685.65	12.98	0.00	5.88	8.11	8.11
P-65	J-40	J-5	3293.85	5.40	0.00	5.26	6.59	6.59
P-66	J-29	J-40	3489.75	5.13	0.00	5.57	7.33	7.33
P-67	J-41	J-42	3097.95	5.59	0.00	4.94	5.88	5.88
P-68	J-42	J-43	97.95	0.00	0.00	0.16	0.01	0.01
P-85	J-40	J-36	97.95	0.00	0.00	0.16	0.01	0.01

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
0 - OVHPS		----	680.00			
J-4		0.00	677.68	521.00	156.68	67.89
J-5		97.95(1.50)	624.59	470.00	154.59	66.99
J-8		1188.00(1.23)	669.19	534.00	135.19	58.58
J-24		538.50(1.50)	664.47	550.00	114.47	49.60
J-28		97.95(1.50)	640.53	488.00	152.53	66.10
J-29		97.95(1.50)	635.13	483.00	152.13	65.92
J-32		0.00	653.52	516.00	137.52	59.59
J-36		97.95(1.50)	629.99	482.00	147.99	64.13
J-40		97.95(1.50)	630.00	475.00	155.00	67.17
J-41		97.95(1.50)	620.67	483.00	137.67	59.66
J-42		3000.00(**)	615.08	490.00	125.08	54.20
J-43		97.95(1.50)	615.08	495.00	120.08	52.03

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
J-4	67.89	J-24	49.60
J-40	67.17	J-43	52.03
J-5	66.99	J-42	54.20

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-55	5.88	P-68	0.16
P-63	5.88	P-85	0.16
P-62	5.72	P-1	2.46

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
0 - OVHPS	5412.15	

NET SYSTEM INFLOW = 5412.15
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 5412.15

***** HYDRAULIC ANALYSIS COMPLETED *****

\\ARTIC\DWG\648031\SWOV_VTM1-ADD1\SWOV_VTM1-ADD1_WTR_EXHIBIT-A_N&P.DWG 6/14/2024 4:14:51 PM LAYOUT:11x17 USER:Karam

LEGEND

- PROJECT BOUNDARY
- EXISTING WATER
- PROPOSED PUBLIC WATER
- (12) COMPUTER MODEL NODE NUMBER
- [5] COMPUTER MODEL PIPE NUMBER

OCEAN VIEW HILLS PUMP STATION
(ONLY 680 ZONE PUMP STATION IN SERVICE)

OTAY MESA PUMP STATION
(TO BE REPLACED BY FUTURE CITY CIP, CURRENTLY NOT IN SERVICE)

PRINCESS PARK PUMP STATION
(CURRENTLY NOT IN SERVICE)

OTAY WATER DISTRICT EMERGENCY INTERCONNECT
(NORMALLY CLOSED)

OCEAN VIEW HILLS PKWY.
OTAY VALLEY RD.
HERITAGE RD.
OTAY MESA RD.
BROWN FIELD AIRPORT
AIRWAY RD.
CACTUS RD.
BEYER BLVD.
OTAY MESA RD.
INTERSTATE CALIFORNIA 805
905

N

0 1400 FEET

EX.30" [1] (4) EX.30" [11]
EX.12" [31] (8) EX.12" [35] EX.12" [39] EX.12" [43]
EX.16" [51] (55) EX.16" (24)
16" [62] (28) 16" [63] (32)
(22) (29) 16" [66] (5) (36)
16" [65] (6) 16" [85] (40)
16" [67] (41)
(42) (43) 16" [68]

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
(760) 438-4422

EXHIBIT A

NODE AND PIPE DIAGRAM

SOUTHWEST VILLAGE
VTM1 ADDENDUM NO.1