

APPENDIX R

Water Study

DEXTER WILSON ENGINEERING, INC.

WATER • WASTEWATER • RECYCLED WATER
CONSULTING ENGINEERS

WATER STUDY FOR THE PALOMAR HEIGHTS PROJECT IN THE CITY OF ESCONDIDO

December 20, 2019

**WATER STUDY
FOR THE
PALOMAR HEIGHTS PROJECT IN THE
CITY OF ESCONDIDO**

December 20, 2019

**Prepared by:
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12-20-2019

Job No. 930-012

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December 20, 2019

930-012

Integral Communities
2235 Encinitas Blvd., Suite 216
Encinitas, CA 92024

Attention: Ninia Hammond, Project Manager

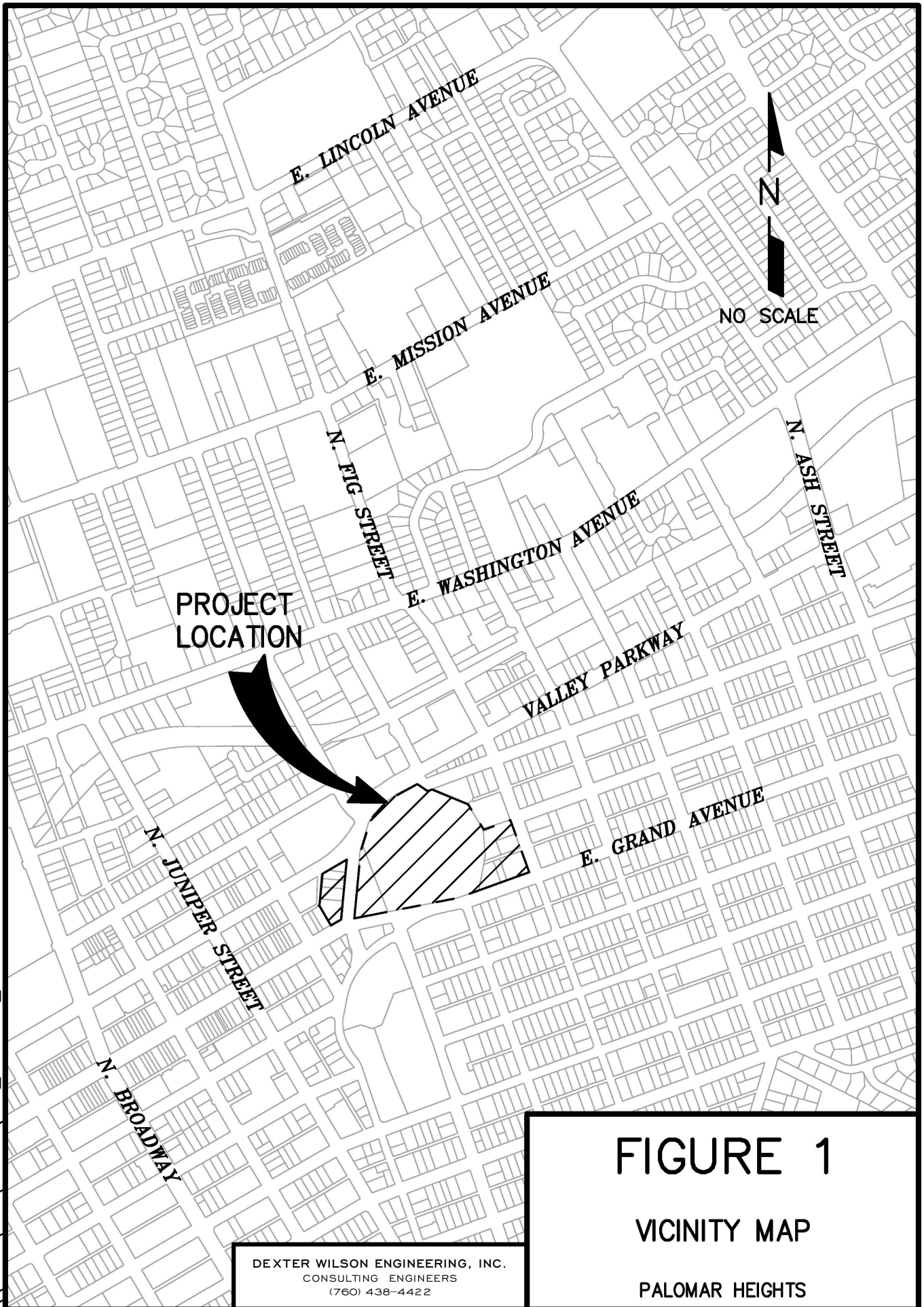
Subject: Water Study for the Palomar Heights Project in the City of Escondido

Introduction

The Palomar Heights project is located in the City of Escondido, south of Valley Parkway, north of East Grand Avenue, and west of North Fig Street. The site was formerly the location of the Palomar Medical Center. Access to the project will be from Valley Parkway on the northwest and Grand Avenue on the south. Figure 1 provides a vicinity map for the project.

The project encompasses approximately 13.80 acres and proposes to develop the site with approximately 510 multi-family residential dwelling units including 258 apartments, 162 townhomes, and 90 senior living apartments, 7,000 square feet of commercial space (divided into a 2,000 square foot retail space, a 3,000 square foot office space, and a 2,000 square foot café and bar), and 4.71 acres of landscaped area. The Senior Housing Building will include 90 senior homes and 2,000 square feet of commercial space. The remaining development will be located in the Main Residential Area. Elevations on the project range from approximately 660 feet to 695 feet.

\\ARTIC\DWG\930012\PHP_FIGURE-1_LOCMAP.DWG 12-20-19 09:39:25 LAYOUT: LAYOUT1



Historical Water Demands

The site for the Palomar Heights project was formerly the Palomar Medical Center and therefore the site has a historical water demand. The Palomar Medical Center was served by 4 water meters including two 2" by 6" compound meters, a 2" meter, and a 2" irrigation meter. The Palomar Heights project also includes the property at 624 E. Grand Avenue which was not a part of the hospital site and was served by a ¾" meter. The City of Escondido analyzed the historical usage of the existing Palomar Medical Center meters and equated the previous demand of the hospital to 348.54 multi-family dwelling units. With the addition of the property at 624 E. Grand, the total historical demand of the site equates to 349.03 multi-family dwelling units. At 300 gpd/DU for multi-family units the average daily demand of the site was 104,708 gpd or 72.71 gpm.

Proposed Water Demands

Water demands were developed in accordance with the City of Escondido Design Standards. Multi-family residential water demand is estimated based on a unit water demand of 300 gpd/DU. The commercial area water demand is estimated using a unit water demand of 2,300 gpd/acre-day. The landscaped area water demand is estimated using a unit water demand of 3,000 gal/acre-day. Table 1 presents the projected average potable water demand for the Palomar Heights project. Figure 2 presents the project's proposed layout.

TABLE 1 PALOMAR HEIGHTS PROJECT AVERAGE POTABLE WATER DEMAND				
Development Type	Net Area, ac	Dwelling Units	Water Demand	Average Water Demand, gpd
Multi-family Residential	5.3	510	300 gpd/EDU	153,000
Landscaped Area	4.71	-	3,000 gpd/acre	14,130
Commercial	0.16	-	2,300 gpd/acre	368
Private Drive and Parking	3.6	-	-	-
TOTAL	13.8	510	-	167,498 (116 gpm)



PALOMAR HEIGHTS

COLORED SITE PLAN EXHIBIT



FIGURE 2
SITE LAND USE PLAN

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PALOMAR HEIGHTS

From the City of Escondido Design Standards, the maximum day demand to average annual demand ratio is 1.8, resulting in an estimated maximum day demand of 301,496 gpd (209 gpm). The peak hour demand to maximum day demand ratio from the City of Escondido Design Standards is 2.7, resulting in an estimated peak hour demand of 814,040 gpd (565 gpm).

City of Escondido Design Criteria

The City of Escondido Design Standards were used to analyze the water system. A summary of the design criteria is presented as Table 2.

TABLE 2 CITY OF ESCONDIDO WATER SYSTEM DESIGN CRITERIA	
Criteria	Design Requirement
Maximum Desirable Static Pressure	110 psi
Minimum Pressure – Peak Hour	40 psi
Minimum Pressure – Max Day plus Fire	20 psi
Maximum Pipeline Head Loss per 1,000 feet	10 feet
Maximum Pipeline Velocity	10 fps

Fire Flow Requirements

The City of Escondido Design Standards were used for the fire flow analysis of the water system for the Palomar Heights project. The fire flow used for both multi-family residential areas and commercial areas is 2,500 gpm.

Existing Water System

The Palomar Heights project is within the City of Escondido's Lindley/A-11 Zone. Specifically, the project is within the Lindley Zone, but the Lindley and A-11 Zones are intertied and therefore combined in the City's 2012 Water Master Plan. The hydraulic grade of the Lindley Zone is 928 feet and the A-11 Zone is 930 feet. The Lindley Zone is mainly supplied by the Lindley Reservoir located off of Pleasantwood Lane approximately 2.5 miles northwest of the project. The Lindley Reservoir has storage capacity of 2 MG and is supplied by the Clearwell Zone (HGL of 975) through Pressure Regulating Station 2 nearby the reservoir.

Backup supply for the portion of the Lindley Zone which the project is located in is supplied by Pressure Regulating Station 5B along the Clearwell Zone Channel Line. The Clearwell Zone Channel Line has a total of seven pressure reducing stations that provide primary and backup supply to the Lindley/A-11 Zone. Pressure Regulating Station 5B is located along North Ash Street, just north of the Escondido Creek approximately 1-mile northeast of the Palomar Heights project. The downstream pressure is typically set at 100 psi and the elevation of the station is approximately 672 feet, resulting in a hydraulic grade of 902 feet. Figure 3 shows the existing water facilities in the vicinity of the Palomar Heights project.

Proposed Water System

The proposed water system will consist of 12-inch public pipelines through the project. The project will also need to replace approximately 900 feet of 6-inch piping with 12-inch piping in Grand Avenue on the south side of the project. The proposed 12-inch water line improvement extends from the existing 12-inch water main in Grand Avenue at the intersection with South Hickory Street east to the intersection of Grand Avenue and Fig Street. There are two proposed connections to the existing City of Escondido public system, one to the 12-inch pipeline in Valley Parkway and another to the upsized 12-inch line in Grand Avenue. Figure 4 presents the proposed water system configuration and pipe sizes.

\\ARTIC\DWG\930012\PHP_WTR_FIGURE-3_EXWTR.DWG 12-20-19 09:47:58 LAYOUT: LAYOUT

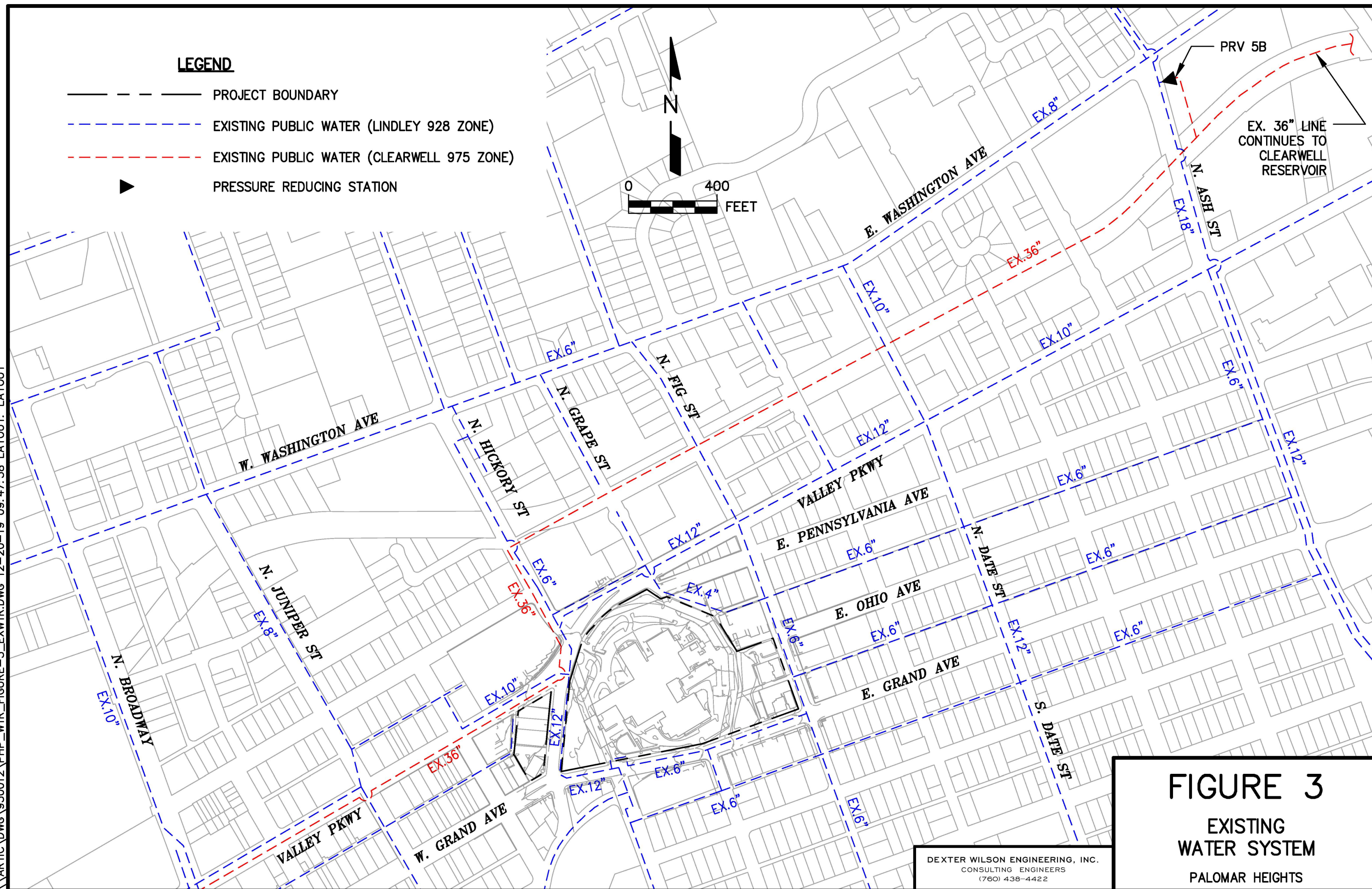


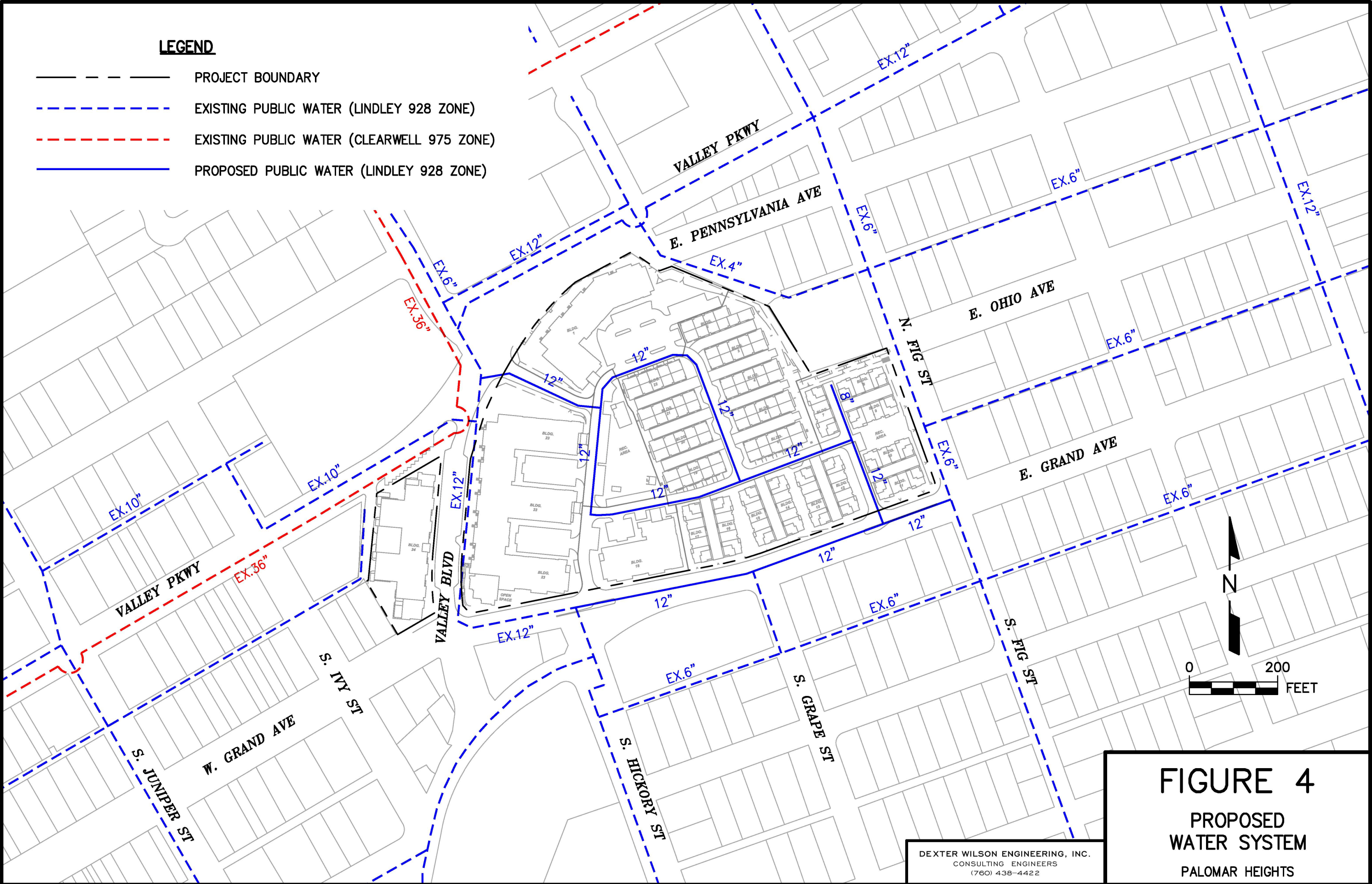
FIGURE 3

EXISTING
WATER SYSTEM

PALOMAR HEIGHTS

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\\ARTIC\DWG\930012\PHP_WTR_FIGURE-4_PROWTR.DWG 12-20-19 10:08:53 LAYOUT: LAYOUT



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FIGURE 4
PROPOSED
WATER SYSTEM
PALOMAR HEIGHTS

Water System Analysis and Results

In order to analyze the proposed water system a hydraulic model of the system was created using KYPIPE computer software program developed by the University of Kentucky. The computer software was used to determine residual pressure throughout the water system and also uses the Hazen-Williams equation for determining head loss on pipes. Pipe lengths throughout the entire project were increased by 10% to simulate minor losses through pipe fittings. Exhibit A presents the Node and Pipe Diagram for the proposed water system. The exhibit's corresponding computer model results are presented in Appendix B.

As previously mentioned, the Palomar Heights project is located within the Lindley Zone which has a hydraulic grade line of 928 feet and is made up of an extensive grid pattern with considerable looping of mostly smaller diameter pipelines. The larger pipelines in North Ash Street and North Broadway between the Lindley Reservoir and the project were added to the model and it was assumed that the project will be served off these lines and the connection to Pressure Reducing Station 5B. The City of Escondido operations team verified that Pressure Reducing Station 5B is set at 100 psi. According to the 2012 Water Master Plan the total average day demand of the Lindley Zone is 5,927 gpm. This demand was distributed throughout the model to simulate the existing condition. The model was then verified against fire hydrant flow tests performed in 2016 and 2012 which reports are provided in Appendix A

The water system was sized based on flow, velocity, and pressure requirements for the proposed project. The 2,500 gpm fire flow requirement was modeled at a single hydrant within the Palomar Heights project. This fire flow was modeled with both of the project's connections open and with the northwestern connection to Valley Parkway closed. Under the second fire flow scenario all flow had to be supplied through the Grand Avenue connection.

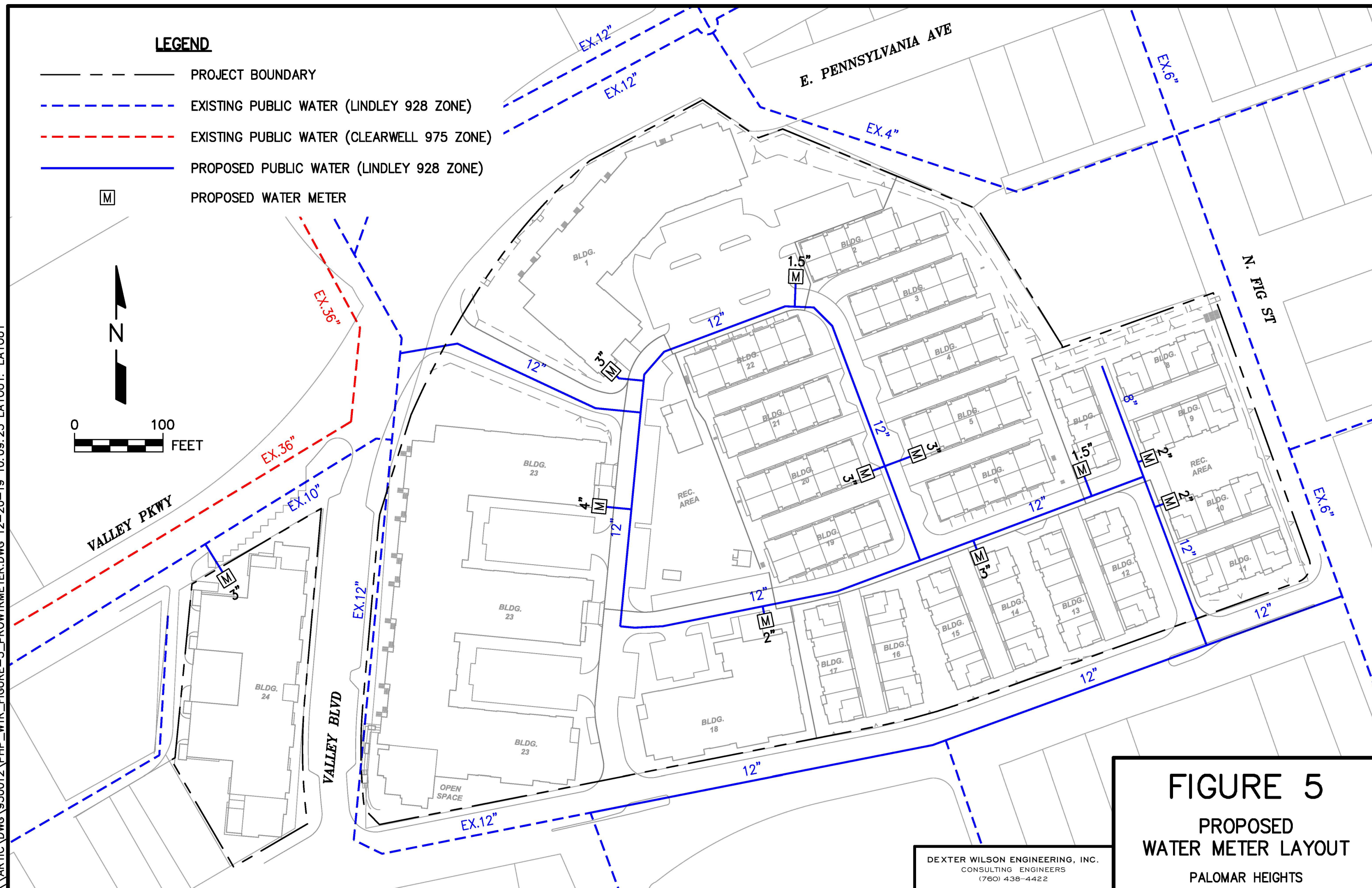
Without upsizing the 6-inch piping in Grand Avenue during the second fire flow analysis with the Valley Parkway connection closed, the velocities within the vicinity of the project exceeded the maximum pipe velocity of 10 feet per second reaching as high as 17.6 feet per second. If the Palomar Heights project extends the 12-inch piping already in Grand Avenue to the project's southern connection these velocities decrease to within the allowed range and the water system has the added benefit of completing the 12-inch loop around Valley Parkway and Grand Avenue and through the project.

After the piping in Grand Avenue is upsized and with all of the pipes open, the fire flow requirement of 2,500 gpm is being met with a minimum residual pressure of 42 psi and a maximum velocity of 8.1 feet per second within the vicinity of the project. With the Valley Parkway connection closed, the fire flow requirement of 2,500 gpm is being met with a minimum residual pressure 40 psi and a maximum velocity of 9.3 feet per second within the vicinity of the project. Under each of these scenarios the fire flow requirement is being met with more than 20 psi of residual pressure and less than 10 feet per second pipe velocity.

Proposed Domestic Water Metering

The backbone water line through the Palomar Heights project will be part of the public system with private lines branching off to serve the buildings. Each private line connection to the public system will have a water meter as depicted in Figure 5. The meters were sized based on the proposed layouts of each residence type or commercial use and an estimated water fixture unit count based on the 2016 California Plumbing Code.

The buildings were grouped based on the most efficient piping layout and meter use. The estimated number of fixture units for each meter was converted to demand based on Chart A 103.1 from the 2016 California Plumbing Code. The meters were sized based on this demand and the capacity standards set by AWWA C700 and C702. The project will be served by a total of 11 meters varying in size from 1.5-inches to 4-inch.



Conclusions and Recommendations

1. The Palomar Heights project will be served by the City of Escondido public water system.
2. The onsite public water system for the Palomar Heights project will connect in two locations. One connection will be made to the existing 12-inch in Valley Parkway and the other will be made in Grand Avenue.
3. To meet water system design criteria, the existing 6-inch water line in Grand Avenue must be replaced with a 12-inch water main from the South Hickory Street intersection east to the intersection of Grand Avenue and Fig Street.
4. The proposed water system layout and sizing of the Palomar Heights project as well as the proposed improvements in Grand Avenue are shown in Figure 4 of this report.
5. The proposed meter layout and sizing for the project is shown in Figure 5 of this report. The project will be served by a total of 11 domestic water meters varying in size from 1.5-inches to 4-inches.
6. This report presents the sizing and a general schematic layout of the proposed domestic water system. The design engineer for these systems should incorporate valves, fittings, and appurtenances as needed for proper installation and long-term operation of the water system in accordance with the design standards of the City of Escondido.

Thank you for the opportunity to assist you with the water system planning for this project. If you have any questions regarding the information presented in this report, please do not hesitate to call.

Dexter Wilson Engineering, Inc.


Andrew Owen, P.E.

AO:KH:ps

APPENDIX A

HYDRANT FLOW TEST REPORTS

Hydrant Flow Test Report

Test Date 1/14/2016

Test Time

Location

North Inland Crises Center
606 E. Valley Parkway
Escondido, ca.

Tested by

INDUSTRIAL FIRE SPRINKLER
KEITH MITCHEL/JAKE SANDAGE
WITNESSED BY
ESCONDIDO FIRE & WATER DEPT.

Notes

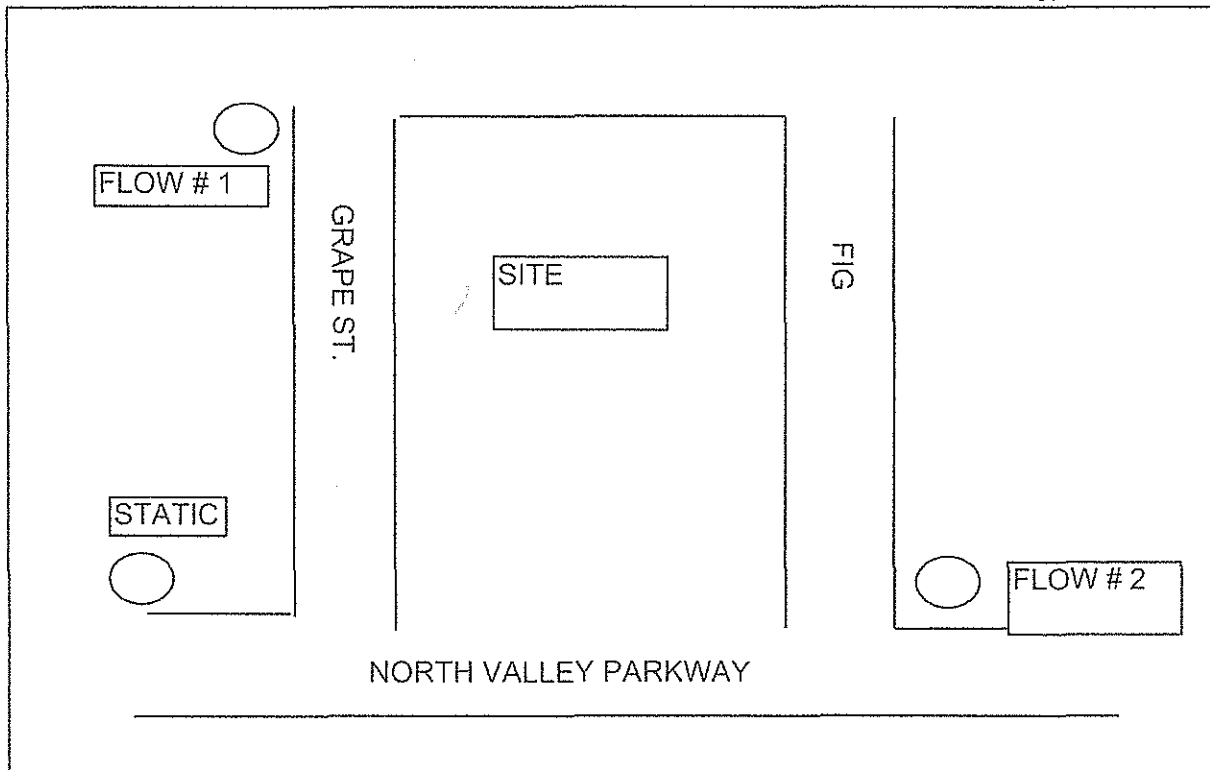
1ST. OUTLET STATIC N. VALLEY PARKWAY AND N.
GRAPE ST.
FLOW HYDRANT N. VALLEY PARKWAY AND FIG
2ND FLOW GRAPE ST.

Read Hydrant

110 psi static pressure
106 psi residual pressure
658.3 ft hydrant elevation

Flow Hydrant(s)

Outlet	Elev	Size	C	Pitot Pressure	Flow
#1	658.3	2.5		65	1225 gpm
#2	658.3	2.5		55	1075 gpm





Millennium Fire Protection Corp.

Date of Test: 7/17/2012 Time of Test: 9:30 AM

Elevation: 664

Project:
Neighborhood Healthcare

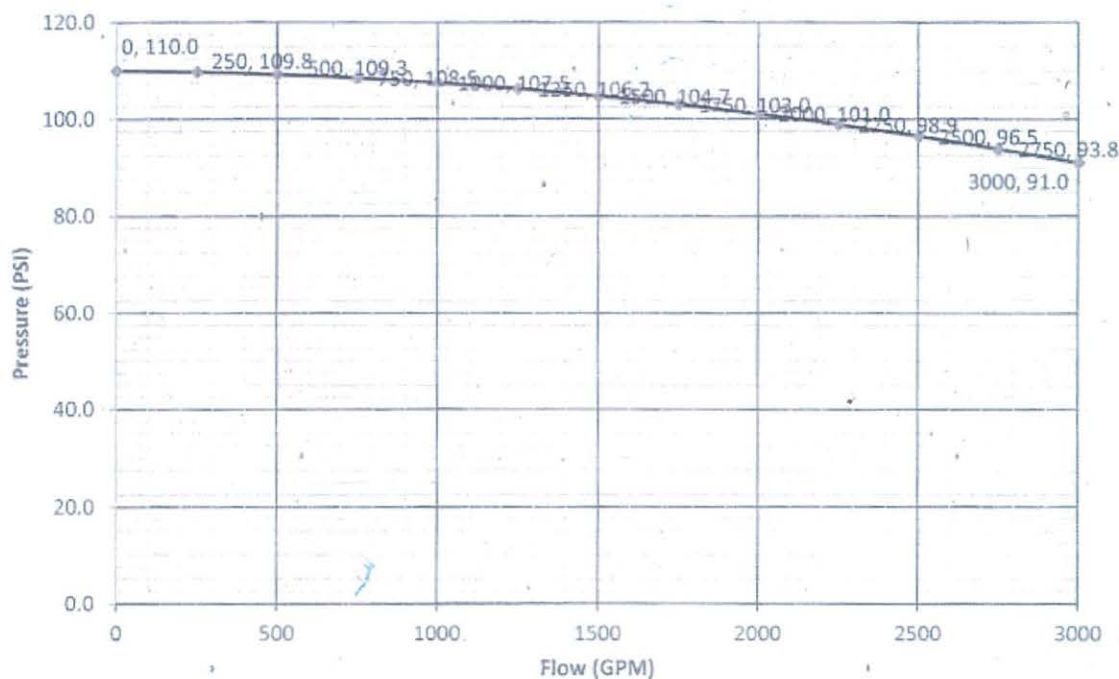
Performed by:
Brian Richardson

Test Address:
728 East Valley Pkwy
Escondido, CA

Witness by:
Jeff Seifert
Escondido Public Works Dept.

Static 110 PSI
Residual 106 PSI
Pitot 72.5 PSI
Outlet Dia. 2.5 IN
Outlet Coff. 0.816

Flow at Residual 1294.1 GPM
Flow at 20 PSI 6952.4 GPM
Flow at 0 PSI 7748.1 GPM



Used for Residual Flow
 $Q = 29.8 \times c \times d^2 \times \sqrt{P_v}$

Used for Pressure at specific Flow
 $Q_f = Q_F \times (h_r^{0.54} / h_f^{0.54})$ $h_r = ((Q_f \times h_f^{0.54}) / Q_F)^{1.85}$

Q= Flow
c= Outlet Coff.
d= Outlet Dia.
Pv= Pitot

Qf= Flow (at desired pressure)
QF= Flow Observed (Flow @ Residual)
hr= Desired Δ Pressure (Static - Desired Pressure i.e 20 psi, 0 psi)
hf= Observed Δ Pressure (Static - Residual)

APPENDIX B

COMPUTER MODELING OUTPUT PALOMAR HEIGHTS WATER SYSTEM

NODE AND PIPE DIAGRAM REFERENCE:

Exhibit A in the back of the report.

CONDITIONS MODELED:

1. Existing Demands to Match Hydrant Flow Test Results
2. Existing Average Day Demands
3. Proposed Average Day Demands
4. Proposed Maximum Day Demands
5. Proposed Peak Hour Demands
6. Proposed Maximum Day Demands plus 2,500 gpm Fire Flow at Node 218
7. Proposed Maximum Day Demands plus 2,500 gpm Fire Flow at Node 218, Pipe 227 Closed

```

* * * * * K Y P I P E * * * * *
*
*   Pipe Network Modeling Software
*
*   CopyRighted by KYPIPE LLC (www.kypipe.com)
*   Version: 9.023 06/04/2018
*   Company: Dexter      Serial #: 592169
*   Interface: Classic
*   Licensed for Pipe2018
*
* * * * *

```

Date & Time: Wed Sep 11 11:51:47 2019

Master File : \\artic\eng\930012\water\ky pipe - 9-2019\930012.KYP\930012.P2K

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

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

```

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

```

R E G U L A T I N G V A L V E D A T A

VALVE LABEL	VALVE TYPE	VALVE SETTING (ft or gpm)
PRV-5B	PRV-1	925.85

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.
101	Lindley	102	2710.00	8.00	125.0000	0.35
103	102	104	2010.00	8.00	125.0000	0.35
105	102	104	2010.00	8.00	125.0000	0.35
107	104	106	1480.00	16.00	100.0000	0.35
109	106	108	2930.00	12.00	125.0000	0.35
111	108	110	1030.00	12.00	125.0000	0.35
113	110	112	1450.00	12.00	125.0000	0.35
115	112	148	2090.00	10.00	125.0000	0.35
117	Lindley	114	1040.00	18.00	100.0000	0.35
119	114	116	610.00	26.00	100.0000	0.35

121	116	118	350.00	8.00	125.0000	0.35
123	118	120	1700.00	8.00	125.0000	0.35
125	120	124	1240.00	8.00	125.0000	0.35
127	124	104	1540.00	12.00	140.0000	0.35
129	120	122	340.00	8.00	125.0000	0.35
131	122	126	1530.00	8.00	125.0000	0.35
133	126	128	3250.00	12.00	125.0000	0.35
135	128	106	1320.00	16.00	125.0000	0.35
137	126	130	2560.00	18.00	100.0000	0.35
139	130	108	5180.00	8.00	125.0000	0.35
141	130	132	1430.00	18.00	100.0000	0.35
143	132	110	5530.00	8.00	125.0000	0.35
145	132	134	1450.00	18.00	100.0000	0.35
147	138	134	210.00	18.00	100.0000	0.35
149	134	136	1820.00	8.00	124.0000	0.35
151	136	142	900.00	10.00	124.0000	0.35
153	138	140	900.00	18.00	100.0000	0.35
155	140	142	1610.00	10.00	124.0000	0.35
157	142	146	1060.00	12.00	139.0000	0.35
159	148	150	230.00	16.00	124.0000	0.35
161	150	152	450.00	10.00	124.0000	0.35
163	152	154	420.00	10.00	124.0000	0.35
165	148	156	1000.00	10.00	139.0000	0.35
167	150	158	1030.00	10.00	124.0000	0.35
169	154	160	1060.00	10.00	124.0000	0.35
171	156	162	210.00	8.00	124.0000	0.35
173	162	168	540.00	10.00	124.0000	0.35
175	168	170	810.00	10.00	139.0000	0.35
177	156	158	230.00	8.00	124.0000	0.35
179	158	160	870.00	8.00	124.0000	0.35
181	160	172	620.00	8.00	124.0000	0.35
183	172	176	320.00	8.00	124.0000	0.35
185	176	178	990.00	8.00	124.0000	0.35
187	178	180	590.00	6.00	125.0000	0.35
189	176	182	580.00	8.00	124.0000	0.35
191	184	182	1050.00	8.00	124.0000	0.35
193	180	184	140.00	8.00	124.0000	0.35
195	180	186	150.00	12.00	124.0000	0.35
197	184	188	480.00	6.00	125.0000	0.35
199	190	188	220.00	6.00	125.0000	0.35
201	188	192	530.00	6.00	125.0000	0.35
203	192	196	200.00	6.00	125.0000	0.35
205	198	196	630.00	6.00	125.0000	0.35
207	146	198	400.00	6.00	125.0000	0.35
209	146	200	540.00	12.00	139.0000	0.35
211	200	198	700.00	4.00	125.0000	0.35
213	200	202	510.00	12.00	124.0000	0.35
215	202	204	190.00	12.00	139.0000	0.35
217	204	170	150.00	12.00	139.0000	0.35
219	170	186	830.00	12.00	124.0000	0.35
221	190	186	490.00	6.00	125.0000	0.35
223	194	190	340.00	6.00	125.0000	0.35
225	196	194	190.00	6.00	125.0000	0.35
227	204	214	260.00	12.00	139.0000	0.35
229	194	224	230.00	12.00	139.0000	0.35
231	O-PRV-5B	138	10.00	36.00	124.0000	0.00
233	Clearwell	I-PRV-5B	16000.00	36.00	124.0000	0.00
235	140	206	780.00	12.00	100.0000	0.00
237	206	208	850.00	12.00	100.0000	0.00
239	206	210	1600.00	6.00	125.0000	0.00

241	208	212	1590.00	6.00	125.0000	0.00
243	142	210	540.00	12.00	139.0000	0.00
245	210	212	840.00	12.00	139.0000	0.00
247	210	198	1050.00	6.00	125.0000	0.00
249	212	192	1070.00	6.00	125.0000	0.00
251	214	216	280.00	12.00	139.0000	0.00
253-XX	216	220	350.00	12.00	139.0000	0.00
255-XX	214	218	270.00	12.00	139.0000	0.00
257	218	220	390.00	12.00	139.0000	0.00
259	224	220	280.00	12.00	139.0000	0.00

N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)

102		131.71	712.00	
104		131.71	708.00	
106		296.35	682.00	
108		296.35	663.00	
110		296.35	657.00	
112		296.35	659.00	
114		131.71	835.00	
116		131.71	819.00	
118		131.71	815.00	
120		131.71	735.00	
122		131.71	736.00	
124		131.71	795.00	
126		395.13	695.00	
128		131.71	695.00	
130		395.13	676.00	
132		395.13	673.00	
134		34.78	671.00	
136		34.78	665.00	
138		0.00	672.00	
140		395.13	673.00	
142		34.78	667.00	
146		1109.78	358.30	
148		34.78	653.00	
150		34.78	655.00	
152		34.78	654.00	
154		34.78	655.00	
156		34.78	656.00	
158		34.78	657.00	
160		34.78	663.00	
162		34.78	656.00	
168		34.78	658.00	
170		34.78	666.00	
172		34.78	671.00	
176		34.78	683.00	
178		34.78	684.00	
180		34.78	693.00	
182		34.78	748.00	
184		34.78	705.00	
186		34.78	689.00	
188		34.78	709.00	

190	34.78	702.00	
192	34.78	674.00	
194	34.78	677.00	
196	34.78	672.00	
198	34.78	665.00	
200	34.78	658.30	
202	34.78	660.00	
204	34.78	664.00	
206	395.13	692.00	
208	395.13	687.00	
210	34.78	667.00	
212	34.78	680.00	
214	36.31	676.00	
216	0.00	680.00	
218	0.00	686.00	
220	0.00	687.00	
224	36.31	680.00	
Clearwell	----	953.00	975.00
Lindley	----	905.00	928.00
O-PRV-5B	----	672.00	925.85
I-PRV-5B	0.00	672.00	

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	=	5
MAXIMUM AND MINIMUM VELOCITIES	=	5
MAXIMUM AND MINIMUM HEAD LOSS/1000	=	5

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

NUMBER OF PIPES	(P) =	80
NUMBER OF END NODES	(J) =	58
NUMBER OF PRIMARY LOOPS	(L) =	21
NUMBER OF SUPPLY NODES	(F) =	2
NUMBER OF SUPPLY ZONES	(Z) =	1

=====

Case: 1 - Existing Demands to Match Hydrant Flow Test Results

RESULTS OBTAINED AFTER 14 TRIALS: ACCURACY = 0.18532E-04

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

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

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

P I P E N A M E	N O D E N U M B E R S		F L O W R A T E	H E A D	M I N O R	L I N E	H L + M L /	H L /
	#1	#2	gpm	LOSS ft	LOSS ft	VELO. ft/s	1000 ft/f	1000 ft/f
101	Lindley	102	479.44	13.64	0.05	3.06	5.05	5.03
103	102	104	173.87	1.55	0.01	1.11	0.77	0.77
105	102	104	173.87	1.55	0.01	1.11	0.77	0.77
107	104	106	403.01	0.28	0.00	0.64	0.19	0.19
109	106	108	584.55	2.96	0.01	1.66	1.01	1.01
111	108	110	550.14	0.93	0.01	1.56	0.91	0.90
113	110	112	555.50	1.33	0.01	1.58	0.93	0.92
115	112	148	259.15	1.14	0.01	1.06	0.55	0.54
117	Lindley	114	878.76	0.47	0.01	1.11	0.46	0.45
119	114	116	747.05	0.03	0.00	0.45	0.06	0.06
121	116	118	615.34	2.80	0.08	3.93	8.23	7.99
123	118	120	483.63	8.70	0.05	3.09	5.15	5.12
125	120	124	318.70	2.93	0.02	2.03	2.38	2.36
127	124	104	186.99	0.15	0.00	0.53	0.10	0.10
129	120	122	33.22	0.01	0.00	0.21	0.04	0.04
131	122	126	-98.49	0.41	0.00	0.63	0.27	0.27
133	126	128	609.60	3.54	0.02	1.73	1.10	1.09
135	128	106	477.89	0.23	0.00	0.76	0.17	0.17
137	126	130	-1103.22	1.76	0.01	1.39	0.69	0.69
139	130	108	261.93	8.51	0.02	1.67	1.65	1.64
141	130	132	-1760.28	2.33	0.03	2.22	1.65	1.63
143	132	110	301.72	11.81	0.02	1.93	2.14	2.14
145	132	134	-2457.13	4.39	0.05	3.10	3.06	3.02
147	138	134	3035.01	0.94	0.08	3.83	4.85	4.47
149	134	136	543.10	11.72	0.07	3.47	6.47	6.44
151	136	142	508.32	1.73	0.02	2.08	1.95	1.92
153	138	140	2608.94	3.04	0.06	3.29	3.45	3.38
155	140	142	1026.00	11.36	0.10	4.19	7.11	7.05
157	142	146	1417.98	4.53	0.09	4.02	4.36	4.28
159	148	150	179.85	0.01	0.00	0.29	0.03	0.03
161	150	152	101.94	0.04	0.00	0.42	0.10	0.10
163	152	154	67.16	0.02	0.00	0.27	0.05	0.05
165	148	156	44.52	0.02	0.00	0.18	0.02	0.02
167	150	158	43.13	0.02	0.00	0.18	0.02	0.02
169	154	160	32.38	0.01	0.00	0.13	0.01	0.01
171	156	162	-27.00	0.01	0.00	0.17	0.03	0.02
173	162	168	-61.78	0.02	0.00	0.25	0.04	0.04
175	168	170	-96.56	0.06	0.00	0.39	0.07	0.07
177	156	158	36.75	0.01	0.00	0.23	0.05	0.04
179	158	160	45.10	0.06	0.00	0.29	0.06	0.06
181	160	172	42.70	0.04	0.00	0.27	0.06	0.06
183	172	176	7.92	0.00	0.00	0.05	0.00	0.00
185	176	178	-5.36	0.00	0.00	0.03	0.00	0.00

187	178	180	-40.14	0.12	0.00	0.46	0.21	0.21
189	176	182	-21.51	0.01	0.00	0.14	0.02	0.02
191	184	182	56.29	0.10	0.00	0.36	0.10	0.10
193	180	184	52.59	0.01	0.00	0.34	0.09	0.09
195	180	186	-127.50	0.01	0.00	0.36	0.07	0.06
197	184	188	-38.48	0.09	0.00	0.44	0.19	0.19
199	190	188	-19.17	0.01	0.00	0.22	0.05	0.05
201	188	192	-92.43	0.51	0.01	1.05	0.98	0.97
203	192	196	79.33	0.15	0.00	0.90	0.75	0.73
205	198	196	71.84	0.38	0.00	0.82	0.61	0.61
207	146	198	-71.00	0.24	0.00	0.81	0.60	0.59
209	146	200	379.21	0.20	0.01	1.08	0.38	0.37
211	200	198	-25.38	0.45	0.00	0.65	0.64	0.64
213	200	202	369.81	0.22	0.01	1.05	0.45	0.44
215	202	204	335.03	0.06	0.00	0.95	0.32	0.30
217	204	170	263.94	0.03	0.00	0.75	0.21	0.19
219	170	186	132.60	0.05	0.00	0.38	0.07	0.07
221	190	186	29.69	0.06	0.00	0.34	0.12	0.12
223	194	190	45.30	0.09	0.00	0.51	0.26	0.26
225	196	194	116.39	0.28	0.01	1.32	1.53	1.49
227	204	214	36.31	0.00	0.00	0.10	0.01	0.00
229	194	224	36.31	0.00	0.00	0.10	0.01	0.00
231	O-PRV-5B	138	5643.94	0.00	0.00	1.78	0.32	0.32
233	Clearwell	I-PRV-5B	5643.94	5.18	0.00	1.78	0.32	0.32
235	140	206	1187.80	4.42	0.00	3.37	5.67	5.67
237	206	208	583.45	1.29	0.00	1.66	1.52	1.52
239	206	210	209.23	7.04	0.00	2.37	4.40	4.40
241	208	212	188.32	5.76	0.00	2.14	3.62	3.62
243	142	210	81.56	0.01	0.00	0.23	0.02	0.02
245	210	212	53.00	0.01	0.00	0.15	0.01	0.01
247	210	198	203.00	4.37	0.00	2.30	4.16	4.16
249	212	192	206.54	4.60	0.00	2.34	4.30	4.30
251	214	216	0.00	0.00	0.00	0.00	0.00	0.00
253-XX	216	220						
255-XX	214	218						
257	218	220	0.00	0.00	0.00	0.00	0.00	0.00
259	224	220	0.00	0.00	0.00	0.00	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
102		131.71	914.31	712.00	202.31	87.67
104		131.71	912.75	708.00	204.75	88.73
106		296.35	912.47	682.00	230.47	99.87
108		296.35	909.50	663.00	246.50	106.82
110		296.35	908.56	657.00	251.56	109.01
112		296.35	907.21	659.00	248.21	107.56
114		131.71	927.52	835.00	92.52	40.09
116		131.71	927.49	819.00	108.49	47.01
118		131.71	924.61	815.00	109.61	47.50
120		131.71	915.86	735.00	180.86	78.37
122		131.71	915.85	736.00	179.85	77.93
124		131.71	912.91	795.00	117.91	51.09
126		395.13	916.26	695.00	221.26	95.88
128		131.71	912.70	695.00	217.70	94.34
130		395.13	918.03	676.00	242.03	104.88
132		395.13	920.39	673.00	247.39	107.20

134	34.78	924.82	671.00	253.82	109.99
136	34.78	913.04	665.00	248.04	107.49
138	0.00	925.84	672.00	253.84	110.00
140	395.13	922.74	673.00	249.74	108.22
142	34.78	911.29	667.00	244.29	105.86
146	1109.78	906.67	358.30	548.37	237.63
148	34.78	906.07	653.00	253.07	109.66
150	34.78	906.06	655.00	251.06	108.79
152	34.78	906.02	654.00	252.02	109.21
154	34.78	906.00	655.00	251.00	108.77
156	34.78	906.05	656.00	250.05	108.36
158	34.78	906.04	657.00	249.04	107.92
160	34.78	905.99	663.00	242.99	105.29
162	34.78	906.06	656.00	250.06	108.36
168	34.78	906.08	658.00	248.08	107.50
170	34.78	906.14	666.00	240.14	104.06
172	34.78	905.95	671.00	234.95	101.81
176	34.78	905.95	683.00	222.95	96.61
178	34.78	905.95	684.00	221.95	96.18
180	34.78	906.07	693.00	213.07	92.33
182	34.78	905.96	748.00	157.96	68.45
184	34.78	906.06	705.00	201.06	87.13
186	34.78	906.08	689.00	217.08	94.07
188	34.78	906.15	709.00	197.15	85.43
190	34.78	906.14	702.00	204.14	88.46
192	34.78	906.67	674.00	232.67	100.83
194	34.78	906.23	677.00	229.23	99.33
196	34.78	906.52	672.00	234.52	101.63
198	34.78	906.91	665.00	241.91	104.83
200	34.78	906.46	658.30	248.16	107.54
202	34.78	906.23	660.00	246.23	106.70
204	34.78	906.17	664.00	242.17	104.94
206	395.13	918.32	692.00	226.32	98.07
208	395.13	917.03	687.00	230.03	99.68
210	34.78	911.28	667.00	244.28	105.85
212	34.78	911.27	680.00	231.27	100.22
214	36.31	906.17	676.00	230.17	99.74
216	0.00	906.17	680.00	226.17	98.01
218	0.00	906.23	686.00	220.23	95.43
220	0.00	906.23	687.00	219.23	95.00
224	36.31	906.23	680.00	226.23	98.03
Clearwell	----	975.00	953.00	22.00	9.53
Lindley	----	928.00	905.00	23.00	9.97
O-PRV-5B	----	925.85	672.00	253.85	110.00
I-PRV-5B	0.00	969.82	672.00	297.82	129.05

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
-----	-----	-----	-----
146	237.63	Clearwell	9.53
I-PRV-5B	129.05	Lindley	9.97
O-PRV-5B	110.00	114	40.09
138	110.00	116	47.01
134	109.99	118	47.50

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
155	4.19	185	0.03
157	4.02	183	0.05
121	3.93	227	0.10
147	3.83	229	0.10
149	3.47	169	0.13

H L + M L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
121	8.23	185	0.00
155	7.11	183	0.00
149	6.47	227	0.01
235	5.67	229	0.01
123	5.15	245	0.01

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
121	7.99	185	0.00
155	7.05	183	0.00
149	6.44	227	0.00
235	5.67	229	0.00
123	5.12	245	0.01

R E G U L A T I N G V A L V E R E P O R T

VALVE LABEL	VALVE TYPE	VALVE SETTING psi or gpm	VALVE STATUS	UPSTREAM PRESSURE psi	DOWNSTREAM PRESSURE psi	THROUGH FLOW gpm
PRV-5B	PRV-1	110.00	ACTIVATED	129.05	110.00	5643.94

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
Clearwell	5643.94	
Lindley	1358.20	

NET SYSTEM INFLOW = 7002.15
 NET SYSTEM OUTFLOW = 0.00
 NET SYSTEM DEMAND = 7002.14

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Case: 2 - Existing Average Day Demands

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)

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABL

RESULTS OBTAINED AFTER 9 TRIALS: ACCURACY = 0.87736E-04

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

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

P I P E N A M E	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
101	Lindley	102	429.75	11.14	0.04	2.74	4.13	4.11
103		104	149.02	1.16	0.00	0.95	0.58	0.58
105		104	149.02	1.16	0.00	0.95	0.58	0.58
107		106	296.13	0.16	0.00	0.47	0.11	0.11
109		108	366.65	1.25	0.01	1.04	0.43	0.43
111		110	272.24	0.25	0.00	0.77	0.25	0.25
113		112	210.96	0.22	0.00	0.60	0.15	0.15
115		148	-85.39	0.15	0.00	0.35	0.07	0.07
117	Lindley	114	832.72	0.42	0.01	1.05	0.41	0.41
119		116	701.01	0.03	0.00	0.42	0.05	0.05
121		118	569.30	2.42	0.07	3.63	7.13	6.92
123		120	437.59	7.23	0.04	2.79	4.28	4.25
125		124	261.51	2.03	0.02	1.67	1.65	1.64
127		104	129.80	0.08	0.00	0.37	0.05	0.05
129		122	44.38	0.02	0.00	0.28	0.06	0.06
131		126	-87.33	0.33	0.00	0.56	0.22	0.21
133		128	498.58	2.44	0.01	1.41	0.75	0.75
135		106	366.87	0.14	0.00	0.59	0.11	0.10
137		130	-981.04	1.41	0.01	1.24	0.56	0.55
139		108	201.94	5.26	0.01	1.29	1.02	1.02
141		132	-1578.12	1.90	0.02	1.99	1.35	1.33
143		110	235.07	7.44	0.01	1.50	1.35	1.34
145		134	-2208.32	3.60	0.04	2.78	2.51	2.48
147		134	2610.25	0.71	0.06	3.29	3.66	3.38
149		136	367.16	5.67	0.03	2.34	3.13	3.12
151		142	332.38	0.79	0.01	1.36	0.89	0.87
153		140	2056.74	1.96	0.04	2.59	2.22	2.18
155		142	675.33	5.23	0.04	2.76	3.28	3.25
157		146	811.55	1.61	0.03	2.30	1.55	1.52
159		150	-9.01	0.00	0.00	0.01	0.00	0.00
161		152	13.84	0.00	0.00	0.06	0.00	0.00
163		154	-20.94	0.00	0.00	0.09	0.01	0.01
165		156	-111.16	0.09	0.00	0.45	0.09	0.09
167		158	-57.63	0.04	0.00	0.24	0.03	0.03
169		160	-55.72	0.03	0.00	0.23	0.03	0.03
171		162	-239.39	0.30	0.01	1.53	1.47	1.41
173		168	-274.17	0.33	0.01	1.12	0.62	0.61
175		170	-308.95	0.50	0.01	1.26	0.63	0.62
177		158	93.45	0.06	0.00	0.60	0.26	0.25
179		160	1.04	0.00	0.00	0.01	0.00	0.00
181		172	-89.46	0.14	0.00	0.57	0.23	0.23
183		176	-124.24	0.13	0.00	0.79	0.43	0.42
185		178	-60.48	0.11	0.00	0.39	0.11	0.11

187	178	180	-95.26	0.60	0.01	1.08	1.04	1.02
189	176	182	-98.53	0.16	0.00	0.63	0.28	0.27
191	184	182	133.31	0.50	0.00	0.85	0.48	0.48
193	180	184	116.98	0.05	0.00	0.75	0.40	0.37
195	180	186	-247.02	0.03	0.00	0.70	0.23	0.21
197	184	188	-51.12	0.16	0.00	0.58	0.33	0.32
199	190	188	-7.58	0.00	0.00	0.09	0.01	0.01
201	188	192	-93.48	0.52	0.01	1.06	1.00	0.99
203	192	196	33.51	0.03	0.00	0.38	0.15	0.15
205	198	196	131.13	1.17	0.01	1.49	1.87	1.85
207	146	198	65.41	0.20	0.00	0.74	0.52	0.51
209	146	200	709.04	0.64	0.02	2.01	1.23	1.19
211	200	198	-25.57	0.45	0.00	0.65	0.65	0.65
213	200	202	699.83	0.73	0.02	1.99	1.47	1.43
215	202	204	665.05	0.20	0.02	1.89	1.15	1.05
217	204	170	593.96	0.13	0.02	1.68	0.96	0.85
219	170	186	250.22	0.18	0.00	0.71	0.22	0.21
221	190	186	31.58	0.06	0.00	0.36	0.13	0.13
223	194	190	58.77	0.14	0.00	0.67	0.43	0.42
225	196	194	129.86	0.35	0.01	1.47	1.88	1.82
227	204	214	36.31	0.00	0.00	0.10	0.01	0.00
229	194	224	36.31	0.00	0.00	0.10	0.01	0.00
231	O-PRV-5B	138	4666.99	0.00	0.00	1.47	0.23	0.23
233	Clearwell	I-PRV-5B	4666.99	3.65	0.00	1.47	0.23	0.23
235	140	206	986.27	3.13	0.00	2.80	4.02	4.02
237	206	208	479.98	0.90	0.00	1.36	1.06	1.06
239	206	210	111.17	2.18	0.00	1.26	1.36	1.36
241	208	212	84.85	1.32	0.00	0.96	0.83	0.83
243	142	210	161.38	0.04	0.00	0.46	0.08	0.08
245	210	212	111.70	0.03	0.00	0.32	0.04	0.04
247	210	198	126.06	1.81	0.00	1.43	1.72	1.72
249	212	192	161.77	2.92	0.00	1.84	2.73	2.73
251	214	216	0.00	0.00	0.00	0.00	0.00	0.00
253-XX	216	220						
255-XX	214	218						
257	218	220	0.00	0.00	0.00	0.00	0.00	0.00
259	224	220	0.00	0.00	0.00	0.00	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

102		131.71	916.82	712.00	204.82	88.75
104		131.71	915.65	708.00	207.65	89.98
106		296.35	915.49	682.00	233.49	101.18
108		296.35	914.24	663.00	251.24	108.87
110		296.35	913.98	657.00	256.98	111.36
112		296.35	913.76	659.00	254.76	110.40
114		131.71	927.57	835.00	92.57	40.11
116		131.71	927.54	819.00	108.54	47.03
118		131.71	925.04	815.00	110.04	47.69
120		131.71	917.78	735.00	182.78	79.20
122		131.71	917.75	736.00	181.75	78.76
124		131.71	915.73	795.00	120.73	52.32
126		395.13	918.08	695.00	223.08	96.67
128		131.71	915.63	695.00	220.63	95.61
130		395.13	919.51	676.00	243.51	105.52

132	395.13	921.43	673.00	248.43	107.65
134	34.78	925.07	671.00	254.07	110.10
136	34.78	919.37	665.00	254.37	110.23
138	0.00	925.84	672.00	253.84	110.00
140	395.13	923.85	673.00	250.85	108.70
142	34.78	918.57	667.00	251.57	109.02
146	37.09(0.03)	916.93	358.30	558.63	242.07
148	34.78	913.91	653.00	260.91	113.06
150	34.78	913.91	655.00	258.91	112.19
152	34.78	913.91	654.00	259.91	112.63
154	34.78	913.91	655.00	258.91	112.19
156	34.78	914.00	656.00	258.00	111.80
158	34.78	913.94	657.00	256.94	111.34
160	34.78	913.94	663.00	250.94	108.74
162	34.78	914.31	656.00	258.31	111.93
168	34.78	914.65	658.00	256.65	111.21
170	34.78	915.16	666.00	249.16	107.97
172	34.78	914.09	671.00	243.09	105.34
176	34.78	914.22	683.00	231.22	100.20
178	34.78	914.33	684.00	230.33	99.81
180	34.78	914.94	693.00	221.94	96.18
182	34.78	914.38	748.00	166.38	72.10
184	34.78	914.89	705.00	209.89	90.95
186	34.78	914.98	689.00	225.98	97.92
188	34.78	915.05	709.00	206.05	89.29
190	34.78	915.04	702.00	213.04	92.32
192	34.78	915.58	674.00	241.58	104.68
194	34.78	915.19	677.00	238.19	103.21
196	34.78	915.55	672.00	243.55	105.54
198	34.78	916.72	665.00	251.72	109.08
200	34.78	916.27	658.30	257.97	111.79
202	34.78	915.52	660.00	255.52	110.73
204	34.78	915.30	664.00	251.30	108.90
206	395.13	920.72	692.00	228.72	99.11
208	395.13	919.82	687.00	232.82	100.89
210	34.78	918.53	667.00	251.53	109.00
212	34.78	918.50	680.00	238.50	103.35
214	36.31	915.30	676.00	239.30	103.70
216	0.00	915.30	680.00	235.30	101.96
218	0.00	915.19	686.00	229.19	99.31
220	0.00	915.19	687.00	228.19	98.88
224	36.31	915.19	680.00	235.19	101.91
Clearwell	----	975.00	953.00	22.00	9.53
Lindley	----	928.00	905.00	23.00	9.97
O-PRV-5B	----	925.85	672.00	253.85	110.00
I-PRV-5B	0.00	971.35	672.00	299.35	129.72

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
-----	-----	-----	-----
146	242.07	Clearwell	9.53
I-PRV-5B	129.72	Lindley	9.97
148	113.06	114	40.11
152	112.63	116	47.03
154	112.19	118	47.69

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
121	3.63	179	0.01
147	3.29	159	0.01
235	2.80	161	0.06
123	2.79	163	0.09
145	2.78	199	0.09

H L + M L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
121	7.13	179	0.00
123	4.28	159	0.00
101	4.13	161	0.00
235	4.02	227	0.01
147	3.66	229	0.01

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
121	6.92	179	0.00
123	4.25	159	0.00
101	4.11	161	0.00
235	4.02	227	0.00
147	3.38	229	0.00

R E G U L A T I N G V A L V E R E P O R T

VALVE LABEL	VALVE TYPE	VALVE SETTING psi or gpm	VALVE STATUS	UPSTREAM PRESSURE psi	DOWNSTREAM PRESSURE psi	THROUGH FLOW gpm
PRV-5B	PRV-1	110.00	ACTIVATED	129.72	110.00	4666.99

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
Clearwell	4666.99	
Lindley	1262.47	

NET SYSTEM INFLOW = 5929.46
 NET SYSTEM OUTFLOW = 0.00
 NET SYSTEM DEMAND = 5929.45

=====

Case: 3 - Proposed Average Day Demands

CHANGES FOR NEXT SIMULATION (Change Number = 2)

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Pipe 221 has a new DIAMETER of..... 12.000
 Pipe 223 has a new DIAMETER of..... 12.000
 Pipe 253 is OPENED
 Pipe 255 is OPENED

RESULTS OBTAINED AFTER 9 TRIALS: ACCURACY = 0.97442E-04

PIPELINE RESULTS

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
101	Lindley	102	431.84	11.24	0.04	2.76	4.16	4.15
103	102	104	150.06	1.18	0.00	0.96	0.59	0.59
105	102	104	150.06	1.18	0.00	0.96	0.59	0.59
107	104	106	300.66	0.16	0.00	0.48	0.11	0.11
109	106	108	375.94	1.31	0.01	1.07	0.45	0.45
111	108	110	284.02	0.27	0.00	0.81	0.27	0.27
113	110	112	225.43	0.25	0.00	0.64	0.17	0.17
115	112	148	-70.92	0.10	0.00	0.29	0.05	0.05
117	Lindley	114	834.66	0.43	0.01	1.05	0.42	0.41
119	114	116	702.95	0.03	0.00	0.42	0.05	0.05
121	116	118	571.24	2.44	0.07	3.65	7.17	6.96
123	118	120	439.53	7.29	0.04	2.81	4.31	4.29
125	120	124	263.95	2.07	0.02	1.68	1.68	1.67
127	124	104	132.24	0.08	0.00	0.38	0.05	0.05
129	120	122	43.87	0.02	0.00	0.28	0.06	0.06
131	122	126	-87.84	0.33	0.00	0.56	0.22	0.22
133	126	128	503.34	2.49	0.01	1.43	0.77	0.76
135	128	106	371.63	0.14	0.00	0.59	0.11	0.11
137	126	130	-986.32	1.43	0.01	1.24	0.56	0.56
139	130	108	204.43	5.38	0.01	1.30	1.04	1.04
141	130	132	-1585.87	1.92	0.02	2.00	1.36	1.34
143	132	110	237.76	7.60	0.01	1.52	1.38	1.37
145	132	134	-2218.77	3.63	0.04	2.80	2.53	2.50
147	138	134	2627.66	0.72	0.06	3.31	3.71	3.42
149	134	136	374.12	5.87	0.03	2.39	3.24	3.23
151	136	142	339.34	0.82	0.01	1.39	0.92	0.91
153	138	140	2079.18	2.00	0.04	2.62	2.26	2.22
155	140	142	689.17	5.43	0.04	2.82	3.40	3.38
157	142	146	835.09	1.70	0.03	2.37	1.63	1.60
159	148	150	-2.29	0.00	0.00	0.00	0.00	0.00
161	150	152	16.66	0.00	0.00	0.07	0.00	0.00
163	152	154	-18.12	0.00	0.00	0.07	0.00	0.00
165	148	156	-103.41	0.08	0.00	0.42	0.08	0.08
167	150	158	-53.73	0.03	0.00	0.22	0.03	0.03

169	154	160	-52.90	0.03	0.00	0.22	0.03	0.03
171	156	162	-225.02	0.26	0.01	1.44	1.31	1.26
173	162	168	-259.80	0.30	0.01	1.06	0.57	0.55
175	168	170	-294.58	0.46	0.01	1.20	0.58	0.57
177	156	158	86.83	0.05	0.00	0.55	0.22	0.22
179	158	160	-1.68	0.00	0.00	0.01	0.00	0.00
181	160	172	-89.36	0.14	0.00	0.57	0.23	0.23
183	172	176	-124.14	0.13	0.00	0.79	0.43	0.42
185	176	178	-60.52	0.11	0.00	0.39	0.11	0.11
187	178	180	-95.30	0.61	0.01	1.08	1.04	1.03
189	176	182	-98.40	0.16	0.00	0.63	0.28	0.27
191	184	182	133.18	0.50	0.00	0.85	0.48	0.48
193	180	184	119.21	0.05	0.00	0.76	0.41	0.39
195	180	186	-249.29	0.03	0.00	0.71	0.23	0.21
197	184	188	-48.75	0.14	0.00	0.55	0.30	0.30
199	190	188	-6.22	0.00	0.00	0.07	0.01	0.01
201	188	192	-89.75	0.49	0.01	1.02	0.93	0.92
203	192	196	39.91	0.04	0.00	0.45	0.21	0.20
205	198	196	132.02	1.18	0.01	1.50	1.89	1.88
207	146	198	64.54	0.20	0.00	0.73	0.51	0.50
209	146	200	733.47	0.68	0.02	2.08	1.31	1.26
211	200	198	-26.99	0.50	0.00	0.69	0.72	0.71
213	200	202	725.68	0.78	0.02	2.06	1.57	1.53
215	202	204	690.90	0.21	0.02	1.96	1.24	1.13
217	204	170	470.71	0.08	0.01	1.34	0.62	0.55
219	170	186	141.35	0.06	0.00	0.40	0.07	0.07
221	190	186	142.72	0.04	0.01	0.40	0.10	0.07
223	194	190	171.28	0.04	0.02	0.49	0.16	0.10
225	196	194	137.15	0.38	0.01	1.56	2.08	2.01
227	204	214	185.41	0.03	0.00	0.53	0.10	0.10
229	194	224	-68.91	0.00	0.00	0.20	0.02	0.02
231	O-PRV-5B	138	4706.84	0.00	0.00	1.48	0.23	0.23
233	Clearwell	I-PRV-5B	4706.84	3.70	0.00	1.48	0.23	0.23
235	140	206	994.88	3.19	0.00	2.82	4.08	4.08
237	206	208	484.52	0.92	0.00	1.37	1.08	1.08
239	206	210	115.23	2.33	0.00	1.31	1.46	1.46
241	208	212	89.39	1.45	0.00	1.01	0.91	0.91
243	142	210	158.64	0.04	0.00	0.45	0.07	0.07
245	210	212	109.83	0.03	0.00	0.31	0.04	0.04
247	210	198	129.25	1.89	0.00	1.47	1.80	1.80
249	212	192	164.44	3.01	0.00	1.87	2.82	2.82
251	214	216	81.50	0.01	0.00	0.23	0.02	0.02
253	216	220	58.20	0.00	0.00	0.17	0.01	0.01
255	214	218	80.61	0.01	0.00	0.23	0.02	0.02
257	218	220	57.31	0.00	0.00	0.16	0.01	0.01
259	224	220	-92.21	0.01	0.00	0.26	0.03	0.03

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

102		131.71	916.72	712.00	204.72	88.71
104		131.71	915.53	708.00	207.53	89.93
106		296.35	915.37	682.00	233.37	101.13
108		296.35	914.06	663.00	251.06	108.79
110		296.35	913.78	657.00	256.78	111.27

112	296.35	913.53	659.00	254.53	110.30
114	131.71	927.57	835.00	92.57	40.11
116	131.71	927.54	819.00	108.54	47.03
118	131.71	925.03	815.00	110.03	47.68
120	131.71	917.70	735.00	182.70	79.17
122	131.71	917.68	736.00	181.68	78.73
124	131.71	915.62	795.00	120.62	52.27
126	395.13	918.01	695.00	223.01	96.64
128	131.71	915.52	695.00	220.52	95.56
130	395.13	919.45	676.00	243.45	105.49
132	395.13	921.39	673.00	248.39	107.64
134	34.78	925.07	671.00	254.07	110.09
136	34.78	919.16	665.00	254.16	110.14
138	0.00	925.84	672.00	253.84	110.00
140	395.13	923.81	673.00	250.81	108.68
142	34.78	918.33	667.00	251.33	108.91
146	37.09(0.03)	916.60	358.30	558.30	241.93
148	34.78	913.63	653.00	260.63	112.94
150	34.78	913.63	655.00	258.63	112.07
152	34.78	913.63	654.00	259.63	112.51
154	34.78	913.63	655.00	258.63	112.07
156	34.78	913.72	656.00	257.72	111.68
158	34.78	913.67	657.00	256.67	111.22
160	34.78	913.67	663.00	250.67	108.62
162	34.78	913.99	656.00	257.99	111.80
168	34.78	914.30	658.00	256.30	111.06
170	34.78	914.76	666.00	248.76	107.80
172	34.78	913.81	671.00	242.81	105.22
176	34.78	913.95	683.00	230.95	100.08
178	34.78	914.06	684.00	230.06	99.69
180	34.78	914.67	693.00	221.67	96.06
182	34.78	914.11	748.00	166.11	71.98
184	34.78	914.61	705.00	209.61	90.83
186	34.78	914.70	689.00	225.70	97.80
188	34.78	914.75	709.00	205.75	89.16
190	34.78	914.75	702.00	212.75	92.19
192	34.78	915.25	674.00	241.25	104.54
194	34.78	914.81	677.00	237.81	103.05
196	34.78	915.20	672.00	243.20	105.39
198	34.78	916.40	665.00	251.40	108.94
200	34.78	915.89	658.30	257.59	111.62
202	34.78	915.09	660.00	255.09	110.54
204	34.78	914.86	664.00	250.86	108.70
206	395.13	920.62	692.00	228.62	99.07
208	395.13	919.71	687.00	232.71	100.84
210	34.78	918.29	667.00	251.29	108.89
212	34.78	918.26	680.00	238.26	103.25
214	23.30(0.64)	914.83	676.00	238.83	103.49
216	23.30	914.82	680.00	234.82	101.76
218	23.30	914.82	686.00	228.82	99.16
220	23.30	914.82	687.00	227.82	98.72
224	23.30(0.64)	914.81	680.00	234.81	101.75
Clearwell	----	975.00	953.00	22.00	9.53
Lindley	----	928.00	905.00	23.00	9.97
O-PRV-5B	----	925.85	672.00	253.85	110.00
I-PRV-5B	0.00	971.30	672.00	299.30	129.70

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
-----	-----	-----	-----
146	241.93	Clearwell	9.53
I-PRV-5B	129.70	Lindley	9.97
148	112.94	114	40.11
152	112.51	116	47.03
154	112.07	118	47.68

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
-----	-----	-----	-----
121	3.65	159	0.00
147	3.31	179	0.01
235	2.82	161	0.07
155	2.82	199	0.07
123	2.81	163	0.07

H L + M L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
-----	-----	-----	-----
121	7.17	159	0.00
123	4.31	179	0.00
101	4.16	161	0.00
235	4.08	163	0.00
147	3.71	199	0.01

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
-----	-----	-----	-----
121	6.96	159	0.00
123	4.29	179	0.00
101	4.15	161	0.00
235	4.08	163	0.00
147	3.42	199	0.01

R E G U L A T I N G V A L V E R E P O R T

VALVE LABEL	VALVE TYPE	VALVE SETTING psi or gpm	VALVE STATUS	UPSTREAM PRESSURE psi	DOWNSTREAM PRESSURE psi	THROUGH FLOW gpm
-----	-----	-----	-----	-----	-----	-----
PRV-5B	PRV-1	110.00	ACTIVATED	129.70	110.00	4706.84

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

Clearwell	4706.84	
Lindley	1266.50	

NET SYSTEM INFLOW = 5973.34
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 5973.33

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Case: 4 - Proposed Maximum Day Demands

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)

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Pipe 221 has a new DIAMETER of..... 12.000
 Pipe 223 has a new DIAMETER of..... 12.000

RESULTS OBTAINED AFTER 11 TRIALS: ACCURACY = 0.44954E-06

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

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

P I P E N A M E	N O D E N U M B E R S		F L O W R A T E	H E A D	M I N O R	L I N E	H L + M L /	H L /
	#1	#2	gpm	LOSS ft	LOSS ft	VELO. ft/s	1000 ft/f	1000 ft/f
101	Lindley	102	743.34	30.74	0.12	4.74	11.39	11.34
103	102	104	253.13	3.10	0.01	1.62	1.55	1.54
105	102	104	253.13	3.10	0.01	1.62	1.55	1.54
107	104	106	499.83	0.42	0.00	0.80	0.28	0.28
109	106	108	651.43	3.61	0.02	1.85	1.24	1.23
111	108	110	489.01	0.75	0.01	1.39	0.74	0.72
113	110	112	387.64	0.68	0.01	1.10	0.48	0.47
115	112	148	-145.79	0.39	0.00	0.60	0.19	0.19
117	Lindley	114	1457.64	1.20	0.02	1.84	1.17	1.15
119	114	116	1220.56	0.08	0.00	0.74	0.14	0.14
121	116	118	983.48	6.67	0.21	6.28	19.66	19.05
123	118	120	746.40	19.43	0.12	4.76	11.50	11.43
125	120	124	467.72	5.96	0.05	2.99	4.85	4.81
127	124	104	230.65	0.23	0.00	0.65	0.15	0.15
129	120	122	41.60	0.02	0.00	0.27	0.06	0.05
131	122	126	-195.48	1.46	0.01	1.25	0.96	0.96
133	126	128	922.11	7.63	0.04	2.62	2.36	2.35
135	128	106	685.03	0.44	0.01	1.09	0.34	0.33
137	126	130	-1828.82	4.48	0.03	2.31	1.76	1.75
139	130	108	371.01	16.22	0.03	2.37	3.14	3.13
141	130	132	-2911.07	5.92	0.07	3.67	4.19	4.14
143	132	110	432.06	22.96	0.04	2.76	4.16	4.15
145	132	134	-4054.36	11.09	0.14	5.11	7.74	7.65
147	138	134	4793.86	2.19	0.20	6.04	11.37	10.43
149	134	136	676.90	17.62	0.10	4.32	9.73	9.68
151	136	142	614.30	2.46	0.03	2.51	2.77	2.73
153	138	140	3757.17	5.98	0.12	4.74	6.78	6.64
155	140	142	1249.36	16.35	0.14	5.10	10.25	10.16
157	142	146	1516.10	5.13	0.10	4.30	4.94	4.84
159	148	150	-15.02	0.00	0.00	0.02	0.00	0.00
161	150	152	25.13	0.00	0.00	0.10	0.01	0.01
163	152	154	-37.47	0.01	0.00	0.15	0.02	0.02
165	148	156	-193.37	0.26	0.00	0.79	0.26	0.26
167	150	158	-102.76	0.10	0.00	0.42	0.10	0.10
169	154	160	-100.07	0.10	0.00	0.41	0.10	0.09
171	156	162	-415.91	0.82	0.04	2.65	4.11	3.93

173	162	168	-478.51	0.93	0.02	1.95	1.76	1.72
175	168	170	-541.12	1.41	0.03	2.21	1.78	1.75
177	156	158	159.93	0.15	0.01	1.02	0.69	0.67
179	158	160	-5.43	0.00	0.00	0.03	0.00	0.00
181	160	172	-168.10	0.45	0.01	1.07	0.74	0.73
183	172	176	-230.71	0.42	0.01	1.47	1.36	1.32
185	176	178	-111.92	0.34	0.00	0.71	0.35	0.35
187	178	180	-174.53	1.86	0.02	1.98	3.18	3.14
189	176	182	-181.39	0.49	0.01	1.16	0.86	0.84
191	184	182	243.99	1.54	0.01	1.56	1.48	1.46
193	180	184	217.18	0.17	0.01	1.39	1.25	1.18
195	180	186	-454.31	0.10	0.01	1.29	0.70	0.64
197	184	188	-89.42	0.44	0.01	1.01	0.92	0.91
199	190	188	-11.86	0.00	0.00	0.13	0.02	0.02
201	188	192	-163.88	1.48	0.02	1.86	2.83	2.80
203	192	196	72.49	0.12	0.00	0.82	0.64	0.62
205	198	196	240.07	3.58	0.04	2.72	5.74	5.68
207	146	198	116.97	0.60	0.01	1.33	1.52	1.50
209	146	200	1332.37	2.06	0.08	3.78	3.96	3.81
211	200	198	-49.17	1.52	0.01	1.26	2.18	2.17
213	200	202	1318.93	2.36	0.08	3.74	4.77	4.62
215	202	204	1256.33	0.65	0.07	3.56	3.78	3.42
217	204	170	860.79	0.25	0.03	2.44	1.91	1.70
219	170	186	257.07	0.19	0.00	0.73	0.23	0.22
221	190	186	259.85	0.11	0.05	0.74	0.32	0.22
223	194	190	310.59	0.11	0.07	0.88	0.51	0.31
225	196	194	249.96	1.16	0.04	2.84	6.35	6.12
227	204	214	332.93	0.08	0.00	0.94	0.31	0.29
229	194	224	-123.23	0.01	0.00	0.35	0.05	0.05
231	O-PRV-5B	138	8551.03	0.01	0.00	2.70	0.70	0.70
233	Clearwell	I-PRV-5B	8551.03	11.19	0.00	2.70	0.70	0.70
235	140	206	1796.57	9.52	0.00	5.10	12.20	12.20
237	206	208	875.19	2.74	0.00	2.48	3.22	3.22
239	206	210	210.15	7.10	0.00	2.38	4.44	4.44
241	208	212	163.95	4.45	0.00	1.86	2.80	2.80
243	142	210	284.96	0.12	0.00	0.81	0.22	0.22
245	210	212	197.63	0.09	0.00	0.56	0.11	0.11
247	210	198	234.87	5.72	0.00	2.66	5.45	5.45
249	212	192	298.98	9.12	0.00	3.39	8.52	8.52
251	214	216	146.30	0.02	0.00	0.42	0.06	0.06
253	216	220	104.36	0.01	0.00	0.30	0.03	0.03
255	214	218	144.69	0.02	0.00	0.41	0.06	0.06
257	218	220	102.75	0.01	0.00	0.29	0.03	0.03
259	224	220	-165.17	0.02	0.00	0.47	0.08	0.08

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
102		237.08(1.80)	897.14	712.00	185.14	80.23
104		237.08(1.80)	894.03	708.00	186.03	80.61
106		533.43(1.80)	893.61	682.00	211.61	91.70
108		533.43(1.80)	889.98	663.00	226.98	98.36
110		533.43(1.80)	889.22	657.00	232.22	100.63
112		533.43(1.80)	888.53	659.00	229.53	99.46
114		237.08(1.80)	926.79	835.00	91.79	39.77

116	237.08(1.80)	926.70	819.00	107.70	46.67
118	237.08(1.80)	919.82	815.00	104.82	45.42
120	237.08(1.80)	900.27	735.00	165.27	71.62
122	237.08(1.80)	900.25	736.00	164.25	71.17
124	237.08(1.80)	894.25	795.00	99.25	43.01
126	711.23(1.80)	901.72	695.00	206.72	89.58
128	237.08(1.80)	894.05	695.00	199.05	86.26
130	711.23(1.80)	906.23	676.00	230.23	99.77
132	711.23(1.80)	912.22	673.00	239.22	103.66
134	62.60(1.80)	923.45	671.00	252.45	109.40
136	62.60(1.80)	905.73	665.00	240.73	104.32
138	0.00	925.84	672.00	253.84	110.00
140	711.23(1.80)	919.74	673.00	246.74	106.92
142	62.60(1.80)	903.24	667.00	236.24	102.37
146	66.76(0.06)	898.01	358.30	539.71	233.87
148	62.60(1.80)	888.92	653.00	235.92	102.23
150	62.60(1.80)	888.92	655.00	233.92	101.37
152	62.60(1.80)	888.92	654.00	234.92	101.80
154	62.60(1.80)	888.93	655.00	233.93	101.37
156	62.60(1.80)	889.19	656.00	233.19	101.05
158	62.60(1.80)	889.03	657.00	232.03	100.54
160	62.60(1.80)	889.03	663.00	226.03	97.95
162	62.60(1.80)	890.05	656.00	234.05	101.42
168	62.60(1.80)	891.00	658.00	233.00	100.97
170	62.60(1.80)	892.44	666.00	226.44	98.12
172	62.60(1.80)	889.49	671.00	218.49	94.68
176	62.60(1.80)	889.92	683.00	206.92	89.67
178	62.60(1.80)	890.27	684.00	206.27	89.38
180	62.60(1.80)	892.14	693.00	199.14	86.30
182	62.60(1.80)	890.42	748.00	142.42	61.71
184	62.60(1.80)	891.97	705.00	186.97	81.02
186	62.60(1.80)	892.25	689.00	203.25	88.07
188	62.60(1.80)	892.41	709.00	183.41	79.48
190	62.60(1.80)	892.41	702.00	190.41	82.51
192	62.60(1.80)	893.91	674.00	219.91	95.30
194	62.60(1.80)	892.58	677.00	215.58	93.42
196	62.60(1.80)	893.79	672.00	221.79	96.11
198	62.60(1.80)	897.40	665.00	232.40	100.71
200	62.60(1.80)	895.88	658.30	237.58	102.95
202	62.60(1.80)	893.44	660.00	233.44	101.16
204	62.60(1.80)	892.72	664.00	228.72	99.11
206	711.23(1.80)	910.22	692.00	218.22	94.56
208	711.23(1.80)	907.49	687.00	220.49	95.54
210	62.60(1.80)	903.13	667.00	236.13	102.32
212	62.60(1.80)	903.03	680.00	223.03	96.65
214	41.94(1.16)	892.64	676.00	216.64	93.88
216	41.94	892.63	680.00	212.63	92.14
218	41.94	892.63	686.00	206.63	89.54
220	41.94	892.61	687.00	205.61	89.10
224	41.94(1.16)	892.59	680.00	212.59	92.12
Clearwell	----	975.00	953.00	22.00	9.53
Lindley	----	928.00	905.00	23.00	9.97
O-PRV-5B	----	925.85	672.00	253.85	110.00
I-PRV-5B	0.00	963.81	672.00	291.81	126.45

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
-----	-----	-----	-----
146	233.87	Clearwell	9.53
I-PRV-5B	126.45	Lindley	9.97
O-PRV-5B	110.00	114	39.77
138	110.00	124	43.01
134	109.40	118	45.42

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
-----	-----	-----	-----
121	6.28	159	0.02
147	6.04	179	0.03
145	5.11	161	0.10
155	5.10	199	0.13
235	5.10	163	0.15

H L + M L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
-----	-----	-----	-----
121	19.66	159	0.00
235	12.20	179	0.00
123	11.50	161	0.01
101	11.39	163	0.02
147	11.37	199	0.02

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
-----	-----	-----	-----
121	19.05	159	0.00
235	12.20	179	0.00
123	11.43	161	0.01
101	11.34	163	0.02
147	10.43	199	0.02

R E G U L A T I N G V A L V E R E P O R T

VALVE LABEL	VALVE TYPE	VALVE SETTING psi or gpm	VALVE STATUS	UPSTREAM PRESSURE psi	DOWNSTREAM PRESSURE psi	THROUGH FLOW gpm
-----	-----	-----	-----	-----	-----	-----
PRV-5B	PRV-1	110.00	ACTIVATED	126.45	110.00	8551.03

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
Clearwell	8551.03	
Lindley	2200.98	

NET SYSTEM INFLOW = 10752.01
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 10752.01

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Case: 5 - Proposed Peak Hour Demands

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)

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Pipe 221 has a new DIAMETER of..... 12.000
 Pipe 223 has a new DIAMETER of..... 12.000

RESULTS OBTAINED AFTER 9 TRIALS: ACCURACY = 0.20742E-05

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

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

P I P E N A M E	N O D E N U M B E R S		F L O W R A T E gpm	H E A D L O S S ft	M I N O R L O S S ft	L I N E V E L O . ft/s	H L + M L / 1000 ft/f	H L / 1000 ft/f
	#1	#2						
101	Lindley	102	1113.05	64.92	0.27	7.10	24.06	23.95
103	102	104	378.72	6.54	0.03	2.42	3.27	3.25
105	102	104	378.72	6.54	0.03	2.42	3.27	3.25
107	104	106	757.80	0.90	0.01	1.21	0.61	0.61
109	106	108	1016.95	8.24	0.05	2.88	2.83	2.81
111	108	110	787.74	1.81	0.03	2.23	1.78	1.75
113	110	112	651.68	1.79	0.02	1.85	1.25	1.23
115	112	148	-148.47	0.40	0.00	0.61	0.19	0.19
117	Lindley	114	2179.21	2.52	0.04	2.75	2.46	2.42
119	114	116	1823.59	0.18	0.01	1.10	0.30	0.29
121	116	118	1467.98	14.00	0.48	9.37	41.36	39.99
123	118	120	1112.36	40.68	0.27	7.10	24.09	23.93
125	120	124	711.61	12.97	0.11	4.54	10.55	10.46
127	124	104	355.99	0.50	0.01	1.01	0.33	0.33
129	120	122	45.14	0.02	0.00	0.29	0.06	0.06
131	122	126	-310.48	3.44	0.02	1.98	2.27	2.25
133	126	128	1414.91	16.85	0.09	4.01	5.21	5.19
135	128	106	1059.30	0.99	0.02	1.69	0.76	0.75
137	126	130	-2792.25	9.81	0.07	3.52	3.86	3.83
139	130	108	570.93	36.04	0.07	3.64	6.97	6.96
141	130	132	-4430.03	12.88	0.17	5.59	9.13	9.01
143	132	110	664.08	50.90	0.10	4.24	9.22	9.20
145	132	134	-6160.96	24.06	0.33	7.77	16.82	16.60
147	138	134	7297.68	4.77	0.46	9.20	24.90	22.71
149	134	136	1042.81	39.22	0.24	6.66	21.68	21.55
151	136	142	948.91	5.49	0.08	3.88	6.19	6.10
153	138	140	5726.67	13.05	0.28	7.22	14.81	14.50
155	140	142	1930.02	36.60	0.34	7.88	22.94	22.73
157	142	146	2354.95	11.60	0.24	6.68	11.17	10.94
159	148	150	20.02	0.00	0.00	0.03	0.00	0.00
161	150	152	56.22	0.01	0.00	0.23	0.03	0.03
163	152	154	-37.68	0.01	0.00	0.15	0.02	0.02
165	148	156	-262.40	0.46	0.01	1.07	0.46	0.46
167	150	158	-130.10	0.16	0.00	0.53	0.16	0.15
169	154	160	-131.59	0.17	0.00	0.54	0.16	0.16
171	156	162	-582.27	1.54	0.08	3.72	7.68	7.32

173	162	168	-676.18	1.76	0.04	2.76	3.34	3.26
175	168	170	-770.09	2.72	0.05	3.15	3.42	3.36
177	156	158	225.97	0.29	0.01	1.44	1.32	1.27
179	158	160	1.96	0.00	0.00	0.01	0.00	0.00
181	160	172	-223.54	0.77	0.01	1.43	1.26	1.24
183	172	176	-317.44	0.76	0.02	2.03	2.45	2.38
185	176	178	-156.11	0.63	0.01	1.00	0.65	0.64
187	178	180	-250.02	3.61	0.04	2.84	6.19	6.12
189	176	182	-255.24	0.92	0.01	1.63	1.61	1.59
191	184	182	349.14	2.98	0.03	2.23	2.87	2.84
193	180	184	313.41	0.33	0.02	2.00	2.48	2.33
195	180	186	-657.34	0.19	0.02	1.86	1.40	1.27
197	184	188	-129.63	0.87	0.01	1.47	1.84	1.81
199	190	188	-37.05	0.04	0.00	0.42	0.18	0.18
201	188	192	-260.59	3.50	0.05	2.96	6.70	6.61
203	192	196	116.95	0.30	0.01	1.33	1.55	1.50
205	198	196	383.89	8.53	0.10	4.36	13.70	13.54
207	146	198	189.16	1.46	0.03	2.15	3.71	3.65
209	146	200	2128.70	4.90	0.20	6.04	9.44	9.08
211	200	198	-78.28	3.59	0.02	2.00	5.16	5.13
213	200	202	2113.07	5.64	0.20	5.99	11.45	11.06
215	202	204	2019.17	1.56	0.18	5.73	9.17	8.23
217	204	170	1259.99	0.52	0.07	3.57	3.90	3.44
219	170	186	395.99	0.41	0.01	1.12	0.51	0.50
221	190	186	355.25	0.20	0.09	1.01	0.58	0.40
223	194	190	412.11	0.18	0.12	1.17	0.88	0.53
225	196	194	406.94	2.87	0.12	4.62	15.69	15.08
227	204	214	665.28	0.27	0.02	1.89	1.13	1.05
229	194	224	-99.08	0.01	0.00	0.28	0.03	0.03
231	O-PRV-5B	138	13024.35	0.02	0.00	4.10	1.52	1.52
233	Clearwell	I-PRV-5B	13024.35	24.39	0.00	4.10	1.52	1.52
235	140	206	2729.80	20.65	0.00	7.74	26.48	26.48
237	206	208	1331.18	5.95	0.00	3.78	7.00	7.00
239	206	210	331.77	16.54	0.00	3.76	10.33	10.33
241	208	212	264.33	10.79	0.00	3.00	6.78	6.78
243	142	210	430.07	0.25	0.00	1.22	0.47	0.47
245	210	212	301.02	0.20	0.00	0.85	0.24	0.24
247	210	198	366.92	13.08	0.00	4.16	12.45	12.45
249	212	192	471.44	21.20	0.00	5.35	19.81	19.81
251	214	216	276.75	0.06	0.00	0.79	0.21	0.21
253	216	220	163.51	0.03	0.00	0.46	0.08	0.08
255	214	218	275.28	0.06	0.00	0.78	0.21	0.21
257	218	220	162.04	0.03	0.00	0.46	0.08	0.08
259	224	220	-212.32	0.04	0.00	0.60	0.13	0.13

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

102		355.62(2.70)	862.81	712.00	150.81	65.35
104		355.62(2.70)	856.24	708.00	148.24	64.24
106		800.15(2.70)	855.33	682.00	173.33	75.11
108		800.15(2.70)	847.04	663.00	184.04	79.75
110		800.15(2.70)	845.21	657.00	188.21	81.56
112		800.15(2.70)	843.40	659.00	184.40	79.91
114		355.62(2.70)	925.44	835.00	90.44	39.19

116	355.62(2.70)	925.26	819.00	106.26	46.04
118	355.62(2.70)	910.78	815.00	95.78	41.51
120	355.62(2.70)	869.83	735.00	134.83	58.43
122	355.62(2.70)	869.81	736.00	133.81	57.98
124	355.62(2.70)	856.75	795.00	61.75	26.76
126	1066.85(2.70)	873.28	695.00	178.28	77.25
128	355.62(2.70)	856.33	695.00	161.33	69.91
130	1066.85(2.70)	883.16	676.00	207.16	89.77
132	1066.85(2.70)	896.21	673.00	223.21	96.72
134	93.91(2.70)	920.60	671.00	249.60	108.16
136	93.91(2.70)	881.14	665.00	216.14	93.66
138	0.00	925.83	672.00	253.83	109.99
140	1066.85(2.70)	912.50	673.00	239.50	103.78
142	93.91(2.70)	875.57	667.00	208.57	90.38
146	37.09(0.03)	863.72	358.30	505.42	219.02
148	93.91(2.70)	843.81	653.00	190.81	82.68
150	93.91(2.70)	843.81	655.00	188.81	81.82
152	93.91(2.70)	843.80	654.00	189.80	82.24
154	93.91(2.70)	843.80	655.00	188.80	81.81
156	93.91(2.70)	844.27	656.00	188.27	81.59
158	93.91(2.70)	843.97	657.00	186.97	81.02
160	93.91(2.70)	843.97	663.00	180.97	78.42
162	93.91(2.70)	845.89	656.00	189.89	82.28
168	93.91(2.70)	847.69	658.00	189.69	82.20
170	93.91(2.70)	850.46	666.00	184.46	79.93
172	93.91(2.70)	844.75	671.00	173.75	75.29
176	93.91(2.70)	845.54	683.00	162.54	70.43
178	93.91(2.70)	846.18	684.00	162.18	70.28
180	93.91(2.70)	849.83	693.00	156.83	67.96
182	93.91(2.70)	846.47	748.00	98.47	42.67
184	93.91(2.70)	849.48	705.00	144.48	62.61
186	93.91(2.70)	850.04	689.00	161.04	69.78
188	93.91(2.70)	850.36	709.00	141.36	61.26
190	93.91(2.70)	850.32	702.00	148.32	64.27
192	93.91(2.70)	853.91	674.00	179.91	77.96
194	93.91(2.70)	850.62	677.00	173.62	75.24
196	93.91(2.70)	853.61	672.00	181.61	78.70
198	93.91(2.70)	862.24	665.00	197.24	85.47
200	93.91(2.70)	858.62	658.30	200.32	86.81
202	93.91(2.70)	852.79	660.00	192.79	83.54
204	93.91(2.70)	851.05	664.00	187.05	81.05
206	1066.85(2.70)	891.85	692.00	199.85	86.60
208	1066.85(2.70)	885.90	687.00	198.90	86.19
210	93.91(2.70)	875.31	667.00	208.31	90.27
212	93.91(2.70)	875.11	680.00	195.11	84.55
214	113.24(3.12)	850.75	676.00	174.75	75.73
216	113.24	850.69	680.00	170.69	73.97
218	113.24	850.70	686.00	164.70	71.37
220	113.24	850.67	687.00	163.67	70.92
224	113.24(3.12)	850.63	680.00	170.63	73.94
Clearwell	----	975.00	953.00	22.00	9.53
Lindley	----	928.00	905.00	23.00	9.97
O-PRV-5B	----	925.85	672.00	253.85	110.00
I-PRV-5B	0.00	950.61	672.00	278.61	120.73

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
-----	-----	-----	-----
146	219.02	Clearwell	9.53
I-PRV-5B	120.73	Lindley	9.97
O-PRV-5B	110.00	124	26.76
138	109.99	114	39.19
134	108.16	118	41.51

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
-----	-----	-----	-----
121	9.37	179	0.01
147	9.20	159	0.03
155	7.88	163	0.15
145	7.77	161	0.23
235	7.74	229	0.28

H L + M L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
-----	-----	-----	-----
121	41.36	179	0.00
235	26.48	159	0.00
147	24.90	163	0.02
123	24.09	229	0.03
101	24.06	161	0.03

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
-----	-----	-----	-----
121	39.99	179	0.00
235	26.48	159	0.00
101	23.95	163	0.02
123	23.93	229	0.03
155	22.73	161	0.03

R E G U L A T I N G V A L V E R E P O R T

VALVE LABEL	VALVE TYPE	VALVE SETTING psi or gpm	VALVE STATUS	UPSTREAM PRESSURE psi	DOWNSTREAM PRESSURE psi	THROUGH FLOW gpm
-----	-----	-----	-----	-----	-----	-----
PRV-5B	PRV-1	110.00	ACTIVATED	120.73	110.00	13024.35

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
Clearwell	13024.35	
Lindley	3292.26	

NET SYSTEM INFLOW = 16316.61
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 16316.62

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Case: 5 - Proposed Maximum Day Demands plus 2,500 gpm Fire Flow at Node 218

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)

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Pipe 221 has a new DIAMETER of..... 12.000
 Pipe 223 has a new DIAMETER of..... 12.000

RESULTS OBTAINED AFTER 8 TRIALS: ACCURACY = 0.42554E-04

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

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

P I P E N A M E	N O D E N U M B E R S		F L O W R A T E	H E A D	M I N O R	L I N E	H L + M L /	H L /
	#1	#2	gpm	LOSS ft	LOSS ft	VELO. ft/s	1000 ft/f	1000 ft/f
101	Lindley	102	884.94	42.45	0.17	5.65	15.73	15.66
103	102	104	323.93	4.90	0.02	2.07	2.45	2.44
105	102	104	323.93	4.90	0.02	2.07	2.45	2.44
107	104	106	800.36	1.00	0.01	1.28	0.68	0.67
109	106	108	1253.38	12.14	0.07	3.56	4.17	4.14
111	108	110	1256.24	4.29	0.07	3.56	4.23	4.16
113	110	112	1339.99	6.80	0.08	3.80	4.74	4.69
115	112	148	806.56	9.30	0.06	3.29	4.48	4.45
117	Lindley	114	1588.83	1.40	0.02	2.00	1.37	1.35
119	114	116	1351.75	0.10	0.00	0.82	0.17	0.17
121	116	118	1114.68	8.41	0.28	7.11	24.81	24.02
123	118	120	877.60	26.22	0.17	5.60	15.53	15.42
125	120	124	626.66	10.25	0.09	4.00	8.34	8.27
127	124	104	389.58	0.59	0.01	1.11	0.39	0.39
129	120	122	13.86	0.00	0.00	0.09	0.01	0.01
131	122	126	-223.22	1.87	0.01	1.42	1.23	1.22
133	126	128	1223.53	12.88	0.07	3.47	3.98	3.96
135	128	106	986.45	0.86	0.01	1.57	0.67	0.66
137	126	130	-2157.98	6.09	0.04	2.72	2.39	2.38
139	130	108	536.29	32.09	0.06	3.42	6.21	6.20
141	130	132	-3405.50	7.92	0.10	4.29	5.61	5.54
143	132	110	617.18	44.44	0.08	3.94	8.05	8.04
145	132	134	-4733.92	14.77	0.19	5.97	10.32	10.19
147	138	134	5839.61	3.16	0.29	7.36	16.43	15.03
149	134	136	1043.09	39.24	0.24	6.66	21.69	21.56
151	136	142	980.49	5.84	0.09	4.01	6.58	6.48
153	138	140	4908.96	9.81	0.21	6.19	11.13	10.90
155	140	142	1983.08	38.48	0.36	8.10	24.12	23.90
157	142	146	2628.15	14.22	0.30	7.46	13.70	13.41
159	148	150	515.54	0.05	0.00	0.82	0.22	0.20
161	150	152	267.84	0.26	0.01	1.09	0.60	0.59
163	152	154	205.24	0.15	0.00	0.84	0.37	0.36
165	148	156	228.42	0.35	0.00	0.93	0.36	0.35
167	150	158	185.09	0.30	0.00	0.76	0.30	0.30
169	154	160	142.63	0.19	0.00	0.58	0.18	0.18
171	156	162	174.61	0.17	0.01	1.11	0.82	0.79

173	162	168	112.01	0.06	0.00	0.46	0.12	0.12
175	168	170	49.40	0.02	0.00	0.20	0.02	0.02
177	156	158	-8.80	0.00	0.00	0.06	0.00	0.00
179	158	160	113.69	0.31	0.00	0.73	0.36	0.36
181	160	172	193.72	0.59	0.01	1.24	0.97	0.95
183	172	176	131.12	0.15	0.00	0.84	0.47	0.46
185	176	178	36.23	0.04	0.00	0.23	0.04	0.04
187	178	180	-26.38	0.06	0.00	0.30	0.10	0.10
189	176	182	32.28	0.02	0.00	0.21	0.03	0.03
191	184	182	30.32	0.03	0.00	0.19	0.03	0.03
193	180	184	17.87	0.00	0.00	0.11	0.01	0.01
195	180	186	-106.85	0.01	0.00	0.30	0.05	0.04
197	184	188	-75.06	0.32	0.00	0.85	0.67	0.66
199	190	188	-165.52	0.63	0.02	1.88	2.94	2.85
201	188	192	-303.18	4.64	0.06	3.44	8.87	8.75
203	192	196	166.05	0.57	0.02	1.88	2.96	2.87
205	198	196	443.67	11.15	0.14	5.03	17.92	17.70
207	146	198	190.32	1.48	0.03	2.16	3.76	3.69
209	146	200	2400.73	6.12	0.25	6.81	11.81	11.34
211	200	198	-91.99	4.84	0.03	2.35	6.96	6.92
213	200	202	2430.12	7.31	0.26	6.89	14.84	14.33
215	202	204	2367.52	2.10	0.25	6.72	12.34	11.05
217	204	170	569.53	0.12	0.01	1.62	0.88	0.79
219	170	186	556.33	0.78	0.01	1.58	0.95	0.93
221	190	186	-386.88	0.23	0.10	1.10	0.68	0.47
223	194	190	-489.79	0.25	0.17	1.39	1.22	0.73
225	196	194	547.12	4.96	0.21	6.21	27.20	26.10
227	204	214	1735.39	1.62	0.13	4.92	6.72	6.22
229	194	224	974.31	0.49	0.04	2.76	2.32	2.13
231	O-PRV-5B	138	10748.57	0.01	0.00	3.39	1.07	1.07
233	Clearwell	I-PRV-5B	10748.57	17.09	0.00	3.39	1.07	1.07
235	140	206	2214.65	14.02	0.00	6.28	17.97	17.97
237	206	208	1089.33	4.11	0.00	3.09	4.83	4.83
239	206	210	414.09	24.93	0.00	4.70	15.58	15.58
241	208	212	378.09	20.93	0.00	4.29	13.16	13.16
243	142	210	272.81	0.11	0.00	0.77	0.20	0.20
245	210	212	216.35	0.11	0.00	0.61	0.13	0.13
247	210	198	407.94	15.91	0.00	4.63	15.15	15.15
249	212	192	531.84	26.50	0.00	6.03	24.77	24.77
251	214	216	856.32	0.47	0.00	2.43	1.68	1.68
253	216	220	814.38	0.54	0.00	2.31	1.53	1.53
255	214	218	837.13	0.44	0.00	2.37	1.61	1.61
257	218	220	795.19	0.57	0.00	2.26	1.47	1.47
259	224	220	932.37	0.55	0.00	2.64	1.97	1.97

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

102		237.08(1.80)	885.38	712.00	173.38	75.13
104		237.08(1.80)	880.46	708.00	172.46	74.73
106		533.43(1.80)	879.45	682.00	197.45	85.56
108		533.43(1.80)	867.24	663.00	204.24	88.51
110		533.43(1.80)	862.89	657.00	205.89	89.22
112		533.43(1.80)	856.01	659.00	197.01	85.37
114		237.08(1.80)	926.58	835.00	91.58	39.68

116	237.08(1.80)	926.47	819.00	107.47	46.57
118	237.08(1.80)	917.79	815.00	102.79	44.54
120	237.08(1.80)	891.40	735.00	156.40	67.77
122	237.08(1.80)	891.39	736.00	155.39	67.34
124	237.08(1.80)	881.06	795.00	86.06	37.29
126	711.23(1.80)	893.27	695.00	198.27	85.92
128	237.08(1.80)	880.33	695.00	185.33	80.31
130	711.23(1.80)	899.40	676.00	223.40	96.81
132	711.23(1.80)	907.42	673.00	234.42	101.58
134	62.60(1.80)	922.38	671.00	251.38	108.93
136	62.60(1.80)	882.91	665.00	217.91	94.43
138	0.00	925.84	672.00	253.84	110.00
140	711.23(1.80)	915.82	673.00	242.82	105.22
142	62.60(1.80)	876.98	667.00	209.98	90.99
146	37.09(0.03)	862.46	358.30	504.16	218.47
148	62.60(1.80)	846.65	653.00	193.65	83.92
150	62.60(1.80)	846.60	655.00	191.60	83.03
152	62.60(1.80)	846.33	654.00	192.33	83.34
154	62.60(1.80)	846.18	655.00	191.18	82.84
156	62.60(1.80)	846.30	656.00	190.30	82.46
158	62.60(1.80)	846.30	657.00	189.30	82.03
160	62.60(1.80)	845.98	663.00	182.98	79.29
162	62.60(1.80)	846.12	656.00	190.12	82.39
168	62.60(1.80)	846.06	658.00	188.06	81.49
170	62.60(1.80)	846.04	666.00	180.04	78.02
172	62.60(1.80)	845.38	671.00	174.38	75.57
176	62.60(1.80)	845.23	683.00	162.23	70.30
178	62.60(1.80)	845.19	684.00	161.19	69.85
180	62.60(1.80)	845.25	693.00	152.25	65.97
182	62.60(1.80)	845.21	748.00	97.21	42.13
184	62.60(1.80)	845.24	705.00	140.24	60.77
186	62.60(1.80)	845.25	689.00	156.25	67.71
188	62.60(1.80)	845.56	709.00	136.56	59.18
190	62.60(1.80)	844.92	702.00	142.92	61.93
192	62.60(1.80)	850.26	674.00	176.26	76.38
194	62.60(1.80)	844.50	677.00	167.50	72.58
196	62.60(1.80)	849.67	672.00	177.67	76.99
198	62.60(1.80)	860.96	665.00	195.96	84.92
200	62.60(1.80)	856.09	658.30	197.79	85.71
202	62.60(1.80)	848.52	660.00	188.52	81.69
204	62.60(1.80)	846.17	664.00	182.17	78.94
206	711.23(1.80)	901.80	692.00	209.80	90.91
208	711.23(1.80)	897.69	687.00	210.69	91.30
210	62.60(1.80)	876.87	667.00	209.87	90.95
212	62.60(1.80)	876.76	680.00	196.76	85.26
214	41.94(1.16)	844.43	676.00	168.43	72.98
216	41.94	843.96	680.00	163.96	71.05
218	41.94	843.99	686.00	157.99	68.46
220	2541.94	843.42	687.00	156.42	67.78
224	41.94(1.16)	843.97	680.00	163.97	71.05
Clearwell	----	975.00	953.00	22.00	9.53
Lindley	----	928.00	905.00	23.00	9.97
O-PRV-5B	----	925.85	672.00	253.85	110.00
I-PRV-5B	0.00	957.91	672.00	285.91	123.89

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
-----	-----	-----	-----
146	218.47	Clearwell	9.53
I-PRV-5B	123.89	Lindley	9.97
O-PRV-5B	110.00	124	37.29
138	110.00	114	39.68
134	108.93	182	42.13

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
-----	-----	-----	-----
155	8.10	177	0.06
157	7.46	129	0.09
147	7.36	193	0.11
121	7.11	191	0.19
213	6.89	175	0.20

H L + M L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
-----	-----	-----	-----
225	27.20	177	0.00
121	24.81	129	0.01
249	24.77	193	0.01
155	24.12	175	0.02
149	21.69	191	0.03

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
-----	-----	-----	-----
225	26.10	177	0.00
249	24.77	129	0.01
121	24.02	193	0.01
155	23.90	175	0.02
149	21.56	191	0.03

R E G U L A T I N G V A L V E R E P O R T

VALVE LABEL	VALVE TYPE	VALVE SETTING psi or gpm	VALVE STATUS	UPSTREAM PRESSURE psi	DOWNSTREAM PRESSURE psi	THROUGH FLOW gpm
-----	-----	-----	-----	-----	-----	-----
PRV-5B	PRV-1	110.00	ACTIVATED	123.89	110.00	10748.57

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
Clearwell	10748.57	
Lindley	2473.77	

NET SYSTEM INFLOW = 13222.34
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 13222.34

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Case: 6 - Proposed Maximum Day Demands plus 2,500 gpm Fire Flow at Node 218, Pipe 227 Closed

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)

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Pipe 221 has a new DIAMETER of..... 12.000
 Pipe 223 has a new DIAMETER of..... 12.000
 Pipe 227 is CLOSED

RESULTS OBTAINED AFTER 8 TRIALS: ACCURACY = 0.25863E-04

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

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

P I P E N A M E	NODE NUMBERS		FLOWRATE	HEAD	MINOR	LINE	HL+ML/ 1000	HL/ 1000
	#1	#2	gpm	LOSS ft	LOSS ft	VELO. ft/s	ft/f	ft/f
-----	-----	-----	-----	-----	-----	-----	-----	-----
101	Lindley	102	883.31	42.31	0.17	5.64	15.68	15.61
103	102	104	323.12	4.87	0.02	2.06	2.44	2.42
105	102	104	323.12	4.87	0.02	2.06	2.44	2.42
107	104	106	796.90	0.99	0.01	1.27	0.67	0.67
109	106	108	1246.38	12.01	0.07	3.54	4.12	4.10
111	108	110	1247.24	4.23	0.07	3.54	4.17	4.11
113	110	112	1328.70	6.69	0.08	3.77	4.67	4.62
115	112	148	795.27	9.06	0.06	3.25	4.36	4.34
117	Lindley	114	1587.36	1.40	0.02	2.00	1.37	1.35
119	114	116	1350.28	0.10	0.00	0.82	0.17	0.17
121	116	118	1113.20	8.39	0.27	7.10	24.74	23.96
123	118	120	876.12	26.14	0.17	5.59	15.48	15.38
125	120	124	624.82	10.20	0.09	3.99	8.29	8.22
127	124	104	387.74	0.59	0.01	1.10	0.39	0.38
129	120	122	14.22	0.00	0.00	0.09	0.01	0.01
131	122	126	-222.85	1.86	0.01	1.42	1.23	1.22
133	126	128	1219.99	12.81	0.07	3.46	3.96	3.94
135	128	106	982.91	0.86	0.01	1.57	0.66	0.65
137	126	130	-2154.08	6.07	0.04	2.72	2.39	2.37
139	130	108	534.29	31.87	0.06	3.41	6.17	6.15
141	130	132	-3399.60	7.89	0.10	4.29	5.59	5.52
143	132	110	614.89	44.14	0.08	3.92	8.00	7.98
145	132	134	-4725.73	14.73	0.19	5.96	10.29	10.16
147	138	134	5833.95	3.15	0.29	7.35	16.40	15.00
149	134	136	1045.62	39.41	0.24	6.67	21.79	21.66
151	136	142	983.02	5.86	0.09	4.02	6.61	6.52
153	138	140	4917.72	9.84	0.21	6.20	11.16	10.93
155	140	142	1987.65	38.65	0.36	8.12	24.23	24.00
157	142	146	2548.34	13.43	0.28	7.23	12.93	12.67
159	148	150	607.45	0.06	0.01	0.97	0.29	0.27
161	150	152	393.49	0.54	0.01	1.61	1.23	1.20
163	152	154	330.89	0.36	0.01	1.35	0.89	0.87
165	148	156	125.22	0.12	0.00	0.51	0.12	0.12
167	150	158	151.36	0.21	0.00	0.62	0.21	0.20

169	154	160	268.28	0.62	0.01	1.10	0.59	0.59
171	156	162	-98.57	0.06	0.00	0.63	0.28	0.27
173	162	168	-161.18	0.12	0.00	0.66	0.23	0.23
175	168	170	-223.78	0.28	0.00	0.91	0.35	0.34
177	156	158	161.19	0.16	0.01	1.03	0.70	0.68
179	158	160	249.94	1.33	0.01	1.60	1.55	1.53
181	160	172	455.62	2.88	0.05	2.91	4.72	4.65
183	172	176	393.02	1.13	0.03	2.51	3.64	3.54
185	176	178	140.20	0.52	0.00	0.89	0.53	0.52
187	178	180	77.60	0.41	0.00	0.88	0.71	0.70
189	176	182	190.21	0.53	0.01	1.21	0.94	0.92
191	184	182	-127.60	0.46	0.00	0.81	0.44	0.44
193	180	184	130.17	0.06	0.00	0.83	0.48	0.46
195	180	186	-115.17	0.01	0.00	0.33	0.05	0.05
197	184	188	195.17	1.86	0.03	2.21	3.92	3.87
199	190	188	-390.68	3.08	0.11	4.43	14.47	13.99
201	188	192	-258.12	3.44	0.05	2.93	6.58	6.49
203	192	196	289.39	1.60	0.06	3.28	8.32	8.02
205	198	196	590.40	18.93	0.24	6.70	30.44	30.05
207	146	198	291.95	3.26	0.06	3.31	8.30	8.16
209	146	200	2219.30	5.30	0.22	6.30	10.20	9.81
211	200	198	-59.72	2.18	0.01	1.52	3.13	3.11
213	200	202	2216.41	6.16	0.21	6.29	12.51	12.09
215	202	204	2153.81	1.76	0.20	6.11	10.34	9.28
217	204	170	2091.20	1.32	0.19	5.93	10.06	8.78
219	170	186	1804.81	6.86	0.14	5.12	8.43	8.26
221	190	186	-1627.04	3.29	1.85	4.62	10.50	6.72
223	194	190	-1955.12	3.21	2.67	5.55	17.30	9.44
225	196	194	817.18	10.42	0.47	9.27	57.33	54.87
227-XX	204	214						
229	194	224	2709.70	3.26	0.32	7.69	15.59	14.19
231	O-PRV-5B	138	10751.67	0.01	0.00	3.39	1.07	1.07
233	Clearwell	I-PRV-5B	10751.67	17.10	0.00	3.39	1.07	1.07
235	140	206	2218.83	14.07	0.00	6.29	18.04	18.04
237	206	208	1091.81	4.12	0.00	3.10	4.85	4.85
239	206	210	415.79	25.12	0.00	4.72	15.70	15.70
241	208	212	380.57	21.19	0.00	4.32	13.32	13.32
243	142	210	359.73	0.18	0.00	1.02	0.34	0.34
245	210	212	292.14	0.19	0.00	0.83	0.23	0.23
247	210	198	420.77	16.85	0.00	4.77	16.05	16.05
249	212	192	610.11	34.17	0.00	6.92	31.94	31.94
251	214	216	-22.35	0.00	0.00	0.06	0.00	0.00
253	216	220	-64.29	0.00	0.00	0.18	0.01	0.01
255	214	218	-19.59	0.00	0.00	0.06	0.00	0.00
257	218	220	-61.53	0.00	0.00	0.17	0.01	0.01
259	224	220	2667.76	3.86	0.00	7.57	13.79	13.79

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

102		237.08(1.80)	885.52	712.00	173.52	75.19
104		237.08(1.80)	880.62	708.00	172.62	74.80
106		533.43(1.80)	879.63	682.00	197.63	85.64
108		533.43(1.80)	867.55	663.00	204.55	88.64
110		533.43(1.80)	863.25	657.00	206.25	89.37

112	533.43(1.80)	856.48	659.00	197.48	85.57
114	237.08(1.80)	926.58	835.00	91.58	39.68
116	237.08(1.80)	926.47	819.00	107.47	46.57
118	237.08(1.80)	917.81	815.00	102.81	44.55
120	237.08(1.80)	891.50	735.00	156.50	67.82
122	237.08(1.80)	891.50	736.00	155.50	67.38
124	237.08(1.80)	881.22	795.00	86.22	37.36
126	711.23(1.80)	893.37	695.00	198.37	85.96
128	237.08(1.80)	880.50	695.00	185.50	80.38
130	711.23(1.80)	899.48	676.00	223.48	96.84
132	711.23(1.80)	907.47	673.00	234.47	101.60
134	62.60(1.80)	922.39	671.00	251.39	108.94
136	62.60(1.80)	882.74	665.00	217.74	94.35
138	0.00	925.84	672.00	253.84	110.00
140	711.23(1.80)	915.79	673.00	242.79	105.21
142	62.60(1.80)	876.78	667.00	209.78	90.91
146	37.09(0.03)	863.07	358.30	504.77	218.73
148	62.60(1.80)	847.36	653.00	194.36	84.22
150	62.60(1.80)	847.29	655.00	192.29	83.33
152	62.60(1.80)	846.74	654.00	192.74	83.52
154	62.60(1.80)	846.37	655.00	191.37	82.93
156	62.60(1.80)	847.24	656.00	191.24	82.87
158	62.60(1.80)	847.08	657.00	190.08	82.37
160	62.60(1.80)	845.74	663.00	182.74	79.19
162	62.60(1.80)	847.30	656.00	191.30	82.90
168	62.60(1.80)	847.43	658.00	189.43	82.09
170	62.60(1.80)	847.71	666.00	181.71	78.74
172	62.60(1.80)	842.81	671.00	171.81	74.45
176	62.60(1.80)	841.64	683.00	158.64	68.75
178	62.60(1.80)	841.12	684.00	157.12	68.09
180	62.60(1.80)	840.70	693.00	147.70	64.00
182	62.60(1.80)	841.10	748.00	93.10	40.34
184	62.60(1.80)	840.63	705.00	135.63	58.77
186	62.60(1.80)	840.71	689.00	151.71	65.74
188	62.60(1.80)	838.75	709.00	129.75	56.23
190	62.60(1.80)	835.57	702.00	133.57	57.88
192	62.60(1.80)	842.24	674.00	168.24	72.90
194	62.60(1.80)	829.68	677.00	152.68	66.16
196	62.60(1.80)	840.57	672.00	168.57	73.05
198	62.60(1.80)	859.75	665.00	194.75	84.39
200	62.60(1.80)	857.56	658.30	199.26	86.35
202	62.60(1.80)	851.18	660.00	191.18	82.85
204	62.60(1.80)	849.22	664.00	185.22	80.26
206	711.23(1.80)	901.72	692.00	209.72	90.88
208	711.23(1.80)	897.59	687.00	210.59	91.26
210	62.60(1.80)	876.60	667.00	209.60	90.83
212	62.60(1.80)	876.41	680.00	196.41	85.11
214	41.94(1.16)	822.23	676.00	146.23	63.37
216	41.94	822.23	680.00	142.23	61.63
218	41.94	822.23	686.00	136.23	59.03
220	2541.94	822.24	687.00	135.24	58.60
224	41.94(1.16)	826.10	680.00	146.10	63.31
Clearwell	----	975.00	953.00	22.00	9.53
Lindley	----	928.00	905.00	23.00	9.97
O-PRV-5B	----	925.85	672.00	253.85	110.00
I-PRV-5B	0.00	957.90	672.00	285.90	123.89

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
-----	-----	-----	-----
146	218.73	Clearwell	9.53
I-PRV-5B	123.89	Lindley	9.97
O-PRV-5B	110.00	124	37.36
138	110.00	114	39.68
134	108.94	182	40.34

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
-----	-----	-----	-----
225	9.27	255	0.06
155	8.12	251	0.06
229	7.69	129	0.09
259	7.57	257	0.17
147	7.35	253	0.18

H L + M L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
-----	-----	-----	-----
225	57.33	255	0.00
249	31.94	251	0.00
205	30.44	129	0.01
121	24.74	257	0.01
155	24.23	253	0.01

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
-----	-----	-----	-----
225	54.87	255	0.00
249	31.94	251	0.00
205	30.05	129	0.01
155	24.00	257	0.01
121	23.96	253	0.01

R E G U L A T I N G V A L V E R E P O R T

VALVE LABEL	VALVE TYPE	VALVE SETTING psi or gpm	VALVE STATUS	UPSTREAM PRESSURE psi	DOWNSTREAM PRESSURE psi	THROUGH FLOW gpm
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PRV-5B	PRV-1	110.00	ACTIVATED	123.89	110.00	10751.67

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
Clearwell	10751.67	
Lindley	2470.67	

NET SYSTEM INFLOW = 13222.34
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 13222.34

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

