

**Christian County Water District – Phase IX System Extension Project
“Antioch Road Tank Zone Area”**

**Owen West Road Water Line Extensions
Hydraulic Comments**

Simulation 1

The affected area is modeled with the existing and proposed customers dispersed according to meter reading routes. The line extensions will be served by the District's Antioch Road elevated tank, which has an overflow of 942 and a capacity of 400,000 gallons. The tank is initially set at 932' (10'<overflow). Peak Demands are calculated as follows:

Approximate Number of Customers in the Pressure Zone: 920

Existing Peak Purchase Day Demand: *Not available*

Existing Average Day Demand (per CCWD usage data): 0.15 gpm/customer

Existing Customers: $10x(\#customers)^{.5} = 10(922)^{.5} = \sim.33$ gpm/each

Proposed Customer: $10x(\#customers)^{.5} = 10(2)^{.5} = \sim 14.1$ gpm total

The model reflects the 0.33 gpm/meter throughout plus an additional 14.1 gpm along the proposed extensions. The model illustrates that adequate pressure is maintained throughout the majority of the system with a low water level in the tank.

Simulation 2 (Owen West Flushing)

This simulation depicts a flushing instance of the proposed four inch extension along Owen West Road with a demand of 98 gpm (2.5 ft/sec) placed at the hydrant location (J-071b). This flushing simulation is modeled using the normal operational use of the District's Antioch Road water tank, while assisted by the Apex elevated tank (Overflow 926'; 200,000 gallon capacity). The four inch line is flushed with a full water tank and normal residential demands throughout. (Q=0.15 gpm/customer per CCWD info).

An electronic version of the KYPIPE file is available upon request.

* * * * * K Y P I P E * * * * *
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 * Pipe Network Modeling Software *
 *
 * CopyRighted by KYPIPE LLC (www.kypipe.com) *
 * Version: 6.025 10/21/2013 *
 * Serial #: 8-5537150 *
 * Interface: Classic *
 * Licensed for Pipe2008 *
 *
 * * * * *

Date & Time: Thu Feb 09 15:52:47 2023

Master File : c:\aa_hydraulics & music\00hydraulics-kypipe\ccwd-orange pressure zone\2023-01 phase ix project.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

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)
RV-1	PRV-1	784.62
RV-2	PRV-1	778.46
RV-3	PRV-1	870.85

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

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1 #2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
HopP-005	R-1 HopJ-005	10000.00	8.00	140.0000	0.00
HopP-012	I-Pump-1 HopJ-005	500.00	8.00	140.0000	0.00
P-36-XX	I-RV-2 J-144	1066.00	3.00	140.0000	0.00
P-56	T-02a JT-02	10.00	6.00	140.0000	0.00
P-100	J-099 J-100	4000.00	6.00	140.0000	0.00
P-101	J-100 J-101	6000.00	4.00	140.0000	0.00
P-102	J-101 J-102	10000.00	4.00	140.0000	0.00
P-103	J-102 J-103	2000.00	4.00	140.0000	0.00
P-104	J-103 J-158	1500.00	4.00	140.0000	0.00
P-105	J-076 J-105	1500.00	6.00	140.0000	0.00
P-106	J-105 J-106	5500.00	6.00	140.0000	0.00
P-107	J-106 J-107	2750.00	4.00	140.0000	0.00
P-108	J-107 J-108	750.00	4.00	140.0000	0.00
P-109	J-106 J-109	6000.00	6.00	140.0000	0.00
P-110	J-109 J-110	4000.00	6.00	140.0000	0.00
P-111	J-110 J-157	2000.00	6.00	140.0000	0.00
P-112	JT-02 J-112	50.00	6.00	140.0000	0.00
P-113	J-112 J-113	1900.00	6.00	140.0000	0.00
P-114	J-113 J-114	4000.00	3.00	140.0000	0.00
P-115	J-113 J-115	9500.00	6.00	140.0000	0.00

P-116	J-115	J-116	2500.00	4.00	140.0000	0.00
P-117	J-115	J-117	4000.00	6.00	140.0000	0.00
P-118	J-117	J-118	1750.00	6.00	140.0000	0.00
P-119	J-118	J-119	4000.00	6.00	140.0000	0.00
P-120	J-119	J-144	1750.00	6.00	140.0000	0.00
P-121	J-046	J-121	1750.00	6.00	140.0000	0.00
P-122	J-121	J-2	2000.00	6.00	140.0000	0.00
P-123	J-2	T-02a	10300.00	6.00	140.0000	0.00
P-124	J-018a	J-124	2250.00	6.00	140.0000	0.00
P-125	J-124	J-125	3500.00	4.00	140.0000	0.00
P-126	J-125	J-125a	2600.00	4.00	140.0000	0.00
P-127	J-126	J-127	2000.00	4.00	140.0000	0.00
P-128	J-127	J-128	3750.00	4.00	140.0000	0.00
P-129	J-128	J-129	5500.00	4.00	140.0000	0.00
P-130	J-126	J-130	2750.00	4.00	140.0000	0.00
P-131	J-130	J-131	2000.00	3.00	140.0000	0.00
P-132	J-130	J-132	1000.00	4.00	140.0000	0.00
P-133	J-132	J-133	1000.00	4.00	140.0000	0.00
P-134	J-133	J-162	4000.00	4.00	140.0000	0.00
P-135	J-124	J-135	3500.00	6.00	140.0000	0.00
P-136	J-135	J-136	5500.00	6.00	140.0000	0.00
P-137	J-136	J-137	4000.00	6.00	140.0000	0.00
P-138	J-138	J-137	4000.00	4.00	140.0000	0.00
P-139	J-139	J-138	1000.00	4.00	140.0000	0.00
P-140	J-140	J-139	1000.00	4.00	140.0000	0.00
P-141	J-141	J-140	2000.00	3.00	140.0000	0.00
P-142	J-142	J-141	3250.00	3.00	140.0000	0.00
P-143	J-142	O-RV-2	1234.00	3.00	140.0000	0.00
P-145	J-145	J-144	4000.00	6.00	140.0000	0.00
P-146	J-146	J-145	5500.00	6.00	140.0000	0.00
P-147	J-146	I-RV-1	250.00	4.00	140.0000	0.00
P-148	O-RV-1	J-148	3000.00	4.00	140.0000	0.00
P-149	J-148	J-149	12000.00	4.00	140.0000	0.00
P-150	J-149	J-150	4000.00	4.00	140.0000	0.00
P-151	J-150	J-151	2000.00	4.00	140.0000	0.00
P-152	J-151	J-152	4000.00	4.00	140.0000	0.00
P-153	J-152	J-181	3500.00	4.00	140.0000	0.00
P-154	J-148	J-154	5000.00	4.00	140.0000	0.00
P-155	J-154	J-155	3500.00	4.00	140.0000	0.00
P-156	J-146	J-156	5500.00	6.00	140.0000	0.00
P-157	J-157	J-156	2000.00	6.00	140.0000	0.00
P-158	J-158	J-157	1500.00	6.00	140.0000	0.00
P-159	J-158	J-159	500.00	6.00	140.0000	0.00
P-160	J-140	J-160	500.00	4.00	140.0000	0.00
P-161	J-160	J-161	3000.00	4.00	140.0000	0.00
P-162	J-161	J-162	5500.00	4.00	140.0000	0.00
P-163	J-163	J-160	4000.00	4.00	140.0000	0.00
P-164	J-163	J-164	9000.00	4.00	140.0000	0.00
P-165	J-164	J-165	2000.00	4.00	140.0000	0.00
P-166	J-165	J-166	2000.00	4.00	140.0000	0.00
P-167	J-165	J-167	2000.00	4.00	140.0000	0.00
P-168	J-167	J-168	4000.00	3.00	140.0000	0.00
P-169	J-170	J-167	4000.00	4.00	140.0000	0.00
P-170	J-164	J-170	6500.00	4.00	140.0000	0.00
P-171	J-170	J-171	500.00	4.00	140.0000	0.00
P-172	J-171	J-171a	950.00	4.00	140.0000	0.00
P-173	J-172	J-173	4300.00	4.00	140.0000	0.00
P-174	J-173	J-174	2000.00	4.00	140.0000	0.00
P-175	J-174	J-175	1000.00	4.00	140.0000	0.00
P-176	J-175	J-175a	750.00	4.00	140.0000	0.00
P-177	J-174	J-177	3000.00	3.00	140.0000	0.00
P-178	J-177	J-178	1250.00	3.00	140.0000	0.00
P-179-XX	J-171	J-179a	50.00	4.00	140.0000	0.00
P-180	J-179	J-180	2000.00	4.00	140.0000	0.00
P-181	J-180	J-181	2000.00	4.00	140.0000	0.00
P-182	J-181	J-182	1750.00	4.00	140.0000	0.00
P-183	J-182	J-183	1250.00	4.00	140.0000	0.00
P-200	J-175a	J-200	7200.00	4.00	140.0000	0.00
P-201	J-200	J-201	2350.00	4.00	140.0000	0.00
P-203	J-201	J-203	1450.00	3.00	140.0000	0.00
P-204	J-201	J-204	1150.00	4.00	140.0000	0.00
P-206	J-206A	J-206B	2500.00	4.00	140.0000	0.00
P-207	J-206B	J-207	3000.00	4.00	140.0000	0.00

P-208	J-207	J-208	6000.00	4.00	140.0000	0.00
P-209	J-208	J-209	1000.00	4.00	140.0000	0.00
P-210	J-209	J-210	1800.00	4.00	140.0000	0.00
P-211	J-176	J-205	8200.00	4.00	140.0000	0.00
P-212	J-205	J-206	3900.00	4.00	140.0000	0.00
P-213	J-206	J-207_	2200.00	3.00	140.0000	0.00
P-214	J-206	J-208_	2000.00	4.00	140.0000	0.00
P-215	J-208_	J-209_	3900.00	3.00	140.0000	0.00
P-216	J-208_	J-210_	400.00	4.00	140.0000	0.00
P-217	J-210_	J-211	6100.00	4.00	140.0000	0.00
P-218	J-210_	J-212	9000.00	4.00	140.0000	0.00
P-219	J-212	J-213	3800.00	4.00	140.0000	0.00
P-220	J-213	J-214	1900.00	4.00	140.0000	0.00
P-001	J-001	O-Pump-1	1500.00	8.00	140.0000	0.00
P-042	J-042	J-001	6000.00	6.00	140.0000	0.00
P-043	J-042	J-043	2400.00	4.00	140.0000	0.00
P-044	J-043	J-044	4500.00	3.00	140.0000	0.00
P-045	J-042	J-045	4500.00	6.00	140.0000	0.00
P-046	J-046	J-045	1750.00	6.00	140.0000	0.00
P-047	J-047	J-046	750.00	6.00	140.0000	0.00
P-048	J-048	J-047	6000.00	6.00	140.0000	0.00
P-049	J-063	J-048	2500.00	6.00	140.0000	0.00
P-050	J-050A	J-050B	1750.00	4.00	140.0000	0.00
P-051	J-050B	J-051	2000.00	4.00	140.0000	0.00
P-052	J-051	J-052	1500.00	4.00	140.0000	0.00
P-053	J-052	J-053	1500.00	4.00	140.0000	0.00
P-054	J-054a	J-054	1500.00	4.00	140.0000	0.00
P-054a	J-050B	J-054a	7250.00	4.00	140.0000	0.00
P-054b	J-054a	J-054b	3100.00	4.00	140.0000	0.00
P-055	J-054	J-055	5000.00	4.00	140.0000	0.00
P-057	J-055	J-057	750.00	6.00	140.0000	0.00
P-058	J-057	J-058	6000.00	6.00	140.0000	0.00
P-059	J-058	J-059	1250.00	6.00	140.0000	0.00
P-060	J-059	J-060	1000.00	6.00	140.0000	0.00
P-061	J-060	J-061	2000.00	6.00	140.0000	0.00
P-062	J-054	J-062	3500.00	6.00	140.0000	0.00
P-063	J-062	J-063	2000.00	6.00	140.0000	0.00
P-064	J-063	J-064	3000.00	6.00	140.0000	0.00
P-064a	J-064	J-064a	2900.00	4.00	140.0000	0.00
P-064b	J-064a	J-064b	2000.00	4.00	140.0000	0.00
P-065	J-064	J-065	8000.00	6.00	140.0000	0.00
P-066	J-065	J-066	2200.00	6.00	140.0000	0.00
P-066a	J-065	J-065a	3900.00	4.00	140.0000	0.00
P-066b	J-065a	J-065b	3000.00	4.00	140.0000	0.00
P-067	J-066	J-067	5000.00	4.00	140.0000	0.00
P-068	J-068	J-067	6500.00	4.00	140.0000	0.00
P-069	J-068	J-069	2000.00	4.00	140.0000	0.00
P-070	J-070	J-069	5000.00	4.00	140.0000	0.00
P-071	J-070	J-071	300.00	4.00	140.0000	0.00
P-071a	J-071	J-071a	1000.00	4.00	140.0000	0.00
P-071b	J-071a	J-071b	2500.00	4.00	140.0000	0.00
P-072	J-071	J-072	3000.00	4.00	140.0000	0.00
P-073	J-072	J-119	4000.00	4.00	140.0000	0.00
P-074	J-066	J-066a	5250.00	6.00	140.0000	0.00
P-075	J-066a	J-075	1500.00	6.00	140.0000	0.00
P-076	J-075	J-076	2250.00	6.00	140.0000	0.00
P-077	J-055	J-077	5250.00	4.00	140.0000	0.00
P-078	J-077	J-078	7000.00	4.00	140.0000	0.00
P-079	J-078	J-079	3750.00	4.00	140.0000	0.00
P-080	J-079	J-080	2000.00	4.00	140.0000	0.00
P-081	J-080	J-081	2500.00	4.00	140.0000	0.00
P-081a	J-081	J-081a	6300.00	4.00	140.0000	0.00
P-081b	J-081a	J-081b	3750.00	4.00	140.0000	0.00
P-081c	J-081b	J-081c	1400.00	4.00	140.0000	0.00
P-082	J-081	J-082	1600.00	4.00	140.0000	0.00
P-082a	J-082	J-082a	4300.00	4.00	140.0000	0.00
P-082b	J-082a	J-082b	9700.00	4.00	140.0000	0.00
P-082c	J-082b	J-082c	700.00	4.00	140.0000	0.00
P-083	J-082	J-083	1900.00	4.00	140.0000	0.00
P-083a	J-083	J-083a	2500.00	4.00	140.0000	0.00
P-083b	J-083a	J-083b	950.00	4.00	140.0000	0.00
P-084	J-080	J-084	750.00	4.00	140.0000	0.00
P-085	J-084	J-085	750.00	4.00	140.0000	0.00

P-086	J-085	J-086	1500.00	4.00	140.0000	0.00
P-087	J-086	J-087	8500.00	4.00	140.0000	0.00
P-087a	J-087	J-087a	2000.00	4.00	140.0000	0.00
P-087b	J-083b	J-087a	3100.00	4.00	140.0000	0.00
P-088	J-087	J-088	3000.00	4.00	140.0000	0.00
P-089	J-088	J-089	1000.00	4.00	140.0000	0.00
P-090	J-086	J-090	1250.00	4.00	140.0000	0.00
P-091	J-091	J-090	2000.00	4.00	140.0000	0.00
P-092	J-091	J-092	1000.00	4.00	140.0000	0.00
P-093	J-092	J-093	2500.00	4.00	140.0000	0.00
P-094	J-091	J-094	1000.00	4.00	140.0000	0.00
P-095	J-094	J-095	2000.00	4.00	140.0000	0.00
P-096	J-095	J-096	2000.00	4.00	140.0000	0.00
P-097	J-096	J-097	1000.00	4.00	140.0000	0.00
P-098	J-097	J-099	1000.00	4.00	140.0000	0.00
P-099	J-076	J-099	500.00	6.00	140.0000	0.00
P-101a	J-101	J-101a	2450.00	4.00	140.0000	0.00
P-120a	J-144	J-144a	1250.00	3.00	140.0000	0.00
P-120b	J-144a	J-144b	2200.00	3.00	140.0000	0.00
P-126a	J-125a	J-126	6900.00	4.00	140.0000	0.00
P-126b	J-125a	J-125b	5650.00	4.00	140.0000	0.00
P-126c	J-125b	J-125c	1300.00	3.00	140.0000	0.00
P-154a	J-154	J-154a	3950.00	4.00	140.0000	0.00
P-155a	J-155	J-155a	2000.00	4.00	140.0000	0.00
P-162a	J-162	J-206A	2000.00	6.00	140.0000	0.00
P-172a	J-171a	J-172	2450.00	4.00	140.0000	0.00
P-172b	J-171a	J-171b	1740.00	4.00	140.0000	0.00
P-176a	J-175a	J-176	750.00	4.00	140.0000	0.00
P-179a	J-179a	J-179	3500.00	4.00	140.0000	0.00
P-203a	J-203	J-203a	1650.00	3.00	140.0000	0.00
P-203b	J-203a	J-203b	1800.00	3.00	140.0000	0.00
P-209a	J-209	J-209a	2300.00	3.00	140.0000	0.00
P-210a	J-210	J-210a	2500.00	4.00	140.0000	0.00
P-210b	J-210a	J-210b	2900.00	4.00	140.0000	0.00
P-56a	JT-02	T-2	10.00	10.00	140.0000	0.00
PrP-020	PrJ-020	I-RV-3	450.00	6.00	140.0000	0.00
PrP-020a	J-018a	O-RV-3	50.00	6.00	140.0000	0.00
PrP-021	PrJ-020	PrJ-021	4500.00	6.00	140.0000	0.00
PrP-022	PrJ-021	PrJ-022	2000.00	6.00	140.0000	0.00
PrP-023	PrJ-022	PrJ-023	1250.00	6.00	140.0000	0.00
PrP-024	PrJ-023	J-112	1750.00	6.00	140.0000	0.00

P U M P / L O S S E L E M E N T D A T A

THERE IS A DEVICE AT NODE Pump-1 DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
256.00	0.00	75.00 (Default)
192.00	460.00	75.00 (Default)
88.00	690.00	75.00 (Default)

N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
HopJ-005	Hop Master M	0.00	541.00	
J-2	AntiochBoost	3.63	630.00	
J-100	KY507:6x4 re	2.64	688.00	
J-101	Start:507&Eb	3.46	770.00	
J-102	Low:Ebenezer	1.49	500.00	
J-103	Ebenezer Ovi	0.50	600.00	
J-105	Hi:Shaw-Ovil	0.82	785.00	
J-106	ShawO&AJDrap	1.49	687.00	
J-107	Low:AJ Drape	0.50	600.00	

J-108	End:AJ Drape	0.50	640.00
J-109	Low:Shaw-Ovi	0.99	550.00
J-110	Shaw Ovil Ro	0.50	620.00
J-112	Antioch&Good	0.50	792.00
J-113	Antioch&Perk	3.13	788.00
J-114	End:Perkins	0.66	800.00
J-115	Antioch&O.We	3.30	696.00
J-116	End:Owen Wes	0.50	550.00
J-117	Antioch Ch R	0.66	640.00
J-118	Antioch Ch R	1.15	687.00
J-119	Antioch & Sh	1.65	604.00
J-121	Antioch&Deas	1.82	600.00
J-124	KY107&OldF H	4.45	718.00
J-125	Old Fruit Hi	2.14	670.00
J-126	Start:Wade R	7.43	530.00
J-127	Wade Road	3.46	610.00
J-128	Hi:Wade Road	0.82	620.00
J-129	End:Wade Roa	0.50	578.00
J-130	Start:Polete	2.64	600.00
J-131	End:Polete	0.33	670.00
J-132	Old Fruit Hi	1.15	560.00
J-133	Old Fruit Hi	2.97	630.00
J-135	Greenville R	5.45	670.00
J-136	Greenville R	4.29	678.00
J-137	Greenville R	2.47	620.00
J-138	Greenville R	1.49	550.00
J-139	Greenville R	1.32	580.00
J-140	KY107@LacyEl	2.47	570.00
J-141	Ovil Road	1.98	550.00
J-142	Ovil Road@Ca	6.60	600.00
J-144	Carl	0.50	540.00
J-145	KY189S@creek	0.50	485.00
J-146	KY189&Frogho	1.98	635.00
J-148	Froghop&HerM	2.31	610.00
J-149	Low:Froghop	2.64	453.00
J-150	Hi:Froghop	0.99	570.00
J-151	Low:Froghop	0.82	480.00
J-152	Hi:Froghop	0.50	560.00
J-154	Start:Melvin	0.66	550.00
J-155	Low:Herring	0.17	450.00
J-156	Low:KY189Sou	1.65	540.00
J-157	KY189&ShawOv	0.82	562.00
J-158	Ovil	1.15	557.00
J-159	End:KY189 S	0.33	550.00
J-160	Fearsville	3.63	560.00
J-161	Crofton-Frui	3.13	640.00
J-162	Fruit Hill	4.12	636.00
J-163	Greenville R	4.95	640.00
J-164	KY107&BluffS	5.61	570.00
J-165	Start:Isom	2.47	580.00
J-166	End:Isom	1.65	570.00
J-167	Start:Meacha	3.30	550.00
J-168	End:Meacham	0.66	520.00
J-170	KY107&BluffS	4.12	490.00
J-171	KY107&CoalCr	0.17	460.00
J-172	Hi:Coal Cree	0.33	482.00
J-173	Lo:Coal Cree	0.66	430.00
J-174	Linville&Coa	0.82	470.00
J-175	Hi:Coal Cree	0.33	490.00
J-176	Start:CoalCr	0.33	440.00
J-177	Hi:Linville	0.33	510.00
J-178	End:Linville	0.17	450.00
J-179	Greenville R	1.32	520.00
J-180	Lo:Greenvill	0.66	478.00
J-181	Froghop&KY10	0.82	513.00
J-182	Greenville R	0.33	550.00
J-183	End:Greenvil	0.00	490.00
J-200	End:Buck For	0.99	589.00
J-201	X-ion:JJ&McK	0.99	550.00
J-203	Start:JJ Roa	0.33	547.00
J-204	End:McKinney	0.17	495.00
J-205	Hi:CoalCreek	0.33	680.00
J-206	Start:TonyGr	0.50	668.00

J-207	FruitHill-Re	2.47	630.00
J-208	FruitHill-Re	1.98	490.00
J-209	Start:Waggon	0.99	540.00
J-210	End:FruitH-R	0.99	530.00
J-211	End:CaryBrid	0.50	411.00
J-212	Hi:Coal Cree	0.33	630.00
J-213	Creek:CoalCr	0.33	400.00
J-214	End:CoalCree	0.17	500.00
J-001	Greenville&A	2.97	564.00
J-018a	End/PRV:Good	0.66	767.00
J-042	Antioch&Zand	5.94	620.00
J-043	Hi:Zander Rd	0.99	650.00
J-044	End:Zander	0.82	570.00
J-045	Antioch Ch R	4.62	632.00
J-046	Antioch&Cumb	1.32	580.00
J-047	Hi:Cumbee	1.98	620.00
J-048	Low:Cumbee	2.81	570.00
J-050A	End: KY507 S	3.96	630.00
J-050B	IntGospelofP	13.86	632.00
J-051	Gospel of Pe	5.11	610.00
J-052	Hi:Gospel of	4.78	630.00
J-053	End:Gospel P	2.14	600.00
J-054	X-ion:KY507&	4.12	651.00
J-054a	Start:Banton	9.07	652.00
J-054b	End:Banton	0.82	605.00
J-055	Butler & Ove	4.45	630.00
J-057	Low:Overby	0.50	600.00
J-058	Overby Ln Be	0.66	650.00
J-059	Overby Ln Be	0.17	600.00
J-060	Overby Lane	0.00	650.00
J-061	End:Overby	0.00	585.00
J-062	Pilot Rock R	1.32	600.00
J-063	Pilot Rk & C	1.82	620.00
J-064	Start:John-R	2.97	608.00
J-064a	X-ion:John-R	0.50	615.00
J-064b	End:Johnson	0.33	650.00
J-065	Start:Geo Sh	3.46	700.00
J-065a	EndA:Geo Sha	0.50	660.00
J-065b	EndB:Geo Sha	0.17	620.00
J-066	PiRock&Shilo	4.29	652.00
J-066a	Old 507 Pump	1.49	690.00
J-067	Hi:Shiloh Ch	2.64	750.00
J-068	Shiloh Churc	0.82	571.00
J-069	Shiloh Churc	0.99	650.00
J-070	Shiloh Churc	0.82	570.00
J-071	Start:Owen W	0.00	655.00
J-071a	High:Owen We	0.33	695.00
J-071b	End:Owen Wes	13.77	560.00
J-072	Lo:Shiloh Ch	0.00	500.00
J-075	Pilot Rock R	0.82	650.00
J-076	PiRock&ShawO	0.82	692.00
J-077	Hi:Butler	4.29	660.00
J-078	Low:Butler	3.46	592.00
J-079	Butler Road	1.15	630.00
J-080	Butler&VauGr	0.50	608.00
J-081	Start:VG-Lil	2.14	615.00
J-081a	Hi:VG-Lil Ri	1.82	625.00
J-081b	VG-LilRiv@68	0.82	605.00
J-081c	End:VG-Lil R	0.17	580.00
J-082	Start:VG-Fai	1.32	616.00
J-082a	Creek:VG-Fai	2.14	590.00
J-082b	Hi:VG-Fairvi	1.65	700.00
J-082c	End:VG-Fairv	0.17	670.00
J-083	Hi:Jeff Adam	0.66	680.00
J-083a	Low:Jeff Ada	0.82	620.00
J-083b	End:Jeff Ada	0.50	640.00
J-084	Butler Road	0.50	640.00
J-085	Butler Road	0.82	620.00
J-086	Butler&Monke	4.45	636.00
J-087	HoneyGrv:Jef	4.95	720.00
J-087a	End:Jeff Ada	0.50	655.00
J-088	Butler Rd	1.98	641.00
J-089	End:Butler	0.33	720.00

J-090	Hi:Monkey No	1.49	706.00	
J-091	MonkeyNorm&L	0.33	650.00	
J-092	Laytonville	0.33	620.00	
J-093	End:Laytonvi	0.33	670.00	
J-094	Monkey Norma	0.82	690.00	
J-095	Monkey Norma	1.15	640.00	
J-096	Hi:Monkey No	0.50	710.00	
J-097	Monkey Norma	0.17	670.00	
J-099	PilotRk&Monk	0.82	700.00	
J-101a	End:KY507 Pi	0.33	840.00	
J-125a	OldFruit&You	3.79	660.00	
J-125b	4x3 on Young	0.50	590.00	
J-125c	End:Young 3"	0.17	560.00	
J-144a	Hi:Antioch E	0.33	580.00	
J-144b	End:Antioch	0.33	555.00	
J-154a	End:MelvinWe	0.50	580.00	
J-155a	End:Herring	0.17	500.00	
J-171a	Start:800@Co	0.50	445.00	
J-171b	End:KY800	0.33	465.00	
J-175a	Start:Buck F	0.66	449.00	
J-179a		0.99	460.00	
J-203a	Creek:JJ Roa	0.17	450.00	
J-203b	End: JJ Road	0.17	515.00	
J-206A	End:FruitHil	0.82	634.00	
J-206B	FruitHill-Re	1.65	560.00	
J-207_	End:TonyGrac	0.17	670.00	
J-208_	Start:Johnso	0.33	642.00	
J-209_	End:Johnson	0.17	560.00	
J-209a	End:Waggoner	0.17	590.00	
J-210_	Start:CaryBr	0.66	640.00	
J-210a	X-ion:Overto	1.15	525.00	
J-210b	End:Overton	0.66	560.00	
JT-02	AntiochTk ba	0.00	792.00	
PrJ-020	High:Goode R	0.50	800.00	
PrJ-021	Goode Road	0.66	710.00	
PrJ-022	High:GoodeRd	0.33	780.00	
PrJ-023	Goode Road	0.33	750.00	
O-Pump-1	Greeville Rd	0.00	540.00	
R-1	Hopkinsville	----	615.00	758.00
O-RV-1	Froghop PRV	----	630.00	784.62
I-RV-2	Carl PRV	0.00	550.00	
I-RV-3	Goode PRV	0.00	767.00	
T-2	Antioch Rd T	----	792.00	932.00
T-02a	Antioch Ch R	2.64	792.00	
I-RV-1	Froghop PRV	0.00	630.00	
I-Pump-1	Greeville Rd	0.00	540.00	
O-RV-2	Carl PRV	----	550.00	778.46
O-RV-3	Goode PRV	----	767.00	870.85

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

OUTPUT SELECTION: THE FOLLOWING RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

ALL CLOSED PIPES ARE NOTED
ALL PIPES WITH PUMPS

FOLLOWING PIPES
P-071a
P-071b

FOLLOWING JUNCTION NODES
J-071
J-071a
J-071b

MAXIMUM AND MINIMUM PRESSURES = 10

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

NUMBER OF PIPES(p) = 207

NUMBER OF END NODES(j) = 197
 NUMBER OF PRIMARY LOOPS(l) = 9
 NUMBER OF SUPPLY NODES(f) = 2
 NUMBER OF SUPPLY ZONES(z) = 1

Case: 0

RESULTS OBTAINED AFTER 9 TRIALS: ACCURACY = 0.00000

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)

Phase IX Extension Project: The 4" line extension will be served by the District's Antioch Road elevated tank, which has an overflow of 942 and a capacity of 400,000 gallons. The tank is initially set at 932' (10'<overflow). The model contains existing customers (920) disbursed by route records with demands equivalent to 10x(#C)^.5 (.33 gpm/customer) & proposed customers (2) at 10x(#C)^.5 or a total of 14.1 gpm at node J-071b.

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 #1	NODE #2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/1000 ft/f	HL/1000 ft/f
P-071a	J-071	J-071a	14.10	0.17	0.00	0.36	0.17	0.17
P-071b	J-071a	J-071b	13.77	0.42	0.00	0.35	0.17	0.17

FOLLOWING ADDITIONAL PIPES ARE CLOSED :
 P-36 P-179

P U M P / L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft	EFFIC-ENCY %	USEFUL POWER Hp	INCREMENTL COST \$	TOTAL COST \$	#PUMPS PARALLEL	#PUMPS SERIES	NPSH avail. ft

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

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
J-071	Start:Owen W	0.00	913.10	655.00	258.10	111.84
J-071a	High:Owen We	0.33	912.93	695.00	217.93	94.43
J-071b	End:Owen Wes	13.77	912.51	560.00	352.51	152.75

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-213	190.72	J-101a	30.99
J-145	186.44	J-018a	44.98
J-211	185.95	O-RV-3	45.00
J-072	179.73	PrJ-020	52.39
J-102	178.61	J-105	54.82
J-173	177.90	J-114	56.47
J-176	173.46	J-112	60.59
J-171a	171.66	T-02a	60.66
J-175a	169.56	JT-02	60.66
J-178	169.17	T-2	60.67

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
RV-1	PRV-1	67.00	ACTIVATED	122.91	67.00	12.87
RV-2	PRV-1	99.00	WIDE OPEN	130.28	130.28	0.00
RV-3	PRV-1	45.00	ACTIVATED	66.47	45.00	112.53

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
R-1	0.00	Hopkinsville
T-2	317.70	Antioch Rd T

NET SYSTEM INFLOW = 317.70
 NET SYSTEM OUTFLOW = 0.00
 NET SYSTEM DEMAND = 317.70

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)

Owen West Flushing Simulation: A 98 gpm demand is placed at the end of the new 4" water line (node J-071b). The tank is reset to the overflow, and the other demands are reset to normal conditions (PSC Report Avg = .15 gpm/cust).

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

TANK at node T-2 has a new HGL of 942.000

RESULTS OBTAINED AFTER 7 TRIALS: ACCURACY = 0.00000

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

PIPE NAME	NODE NUMBERS		FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
	#1	#2						
P-071a	J-071	J-071a	98.15	6.33	0.00	2.51	6.33	6.33
P-071b	J-071a	J-071b	98.00	15.77	0.00	2.50	6.31	6.31

FOLLOWING ADDITIONAL PIPES ARE CLOSED :
 P-36 P-179

P U M P / L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE	INLET HEAD	OUTLET HEAD	PUMP HEAD	EFFIC- ENCY	USEFUL POWER	INCREM TL COST	TOTAL COST	#PUMPS PARALLEL	#PUMPS SERIES	NPSH ft
Avail.	gpm	ft	ft	ft	%	Hp	\$	\$			

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

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
J-071	Start:Owen W	0.00	905.88	655.00	250.88	108.71
J-071a	High:Owen We	0.15(0.45)	899.55	695.00	204.55	88.64
J-071b	End:Owen Wes	98.00(7.12)	883.78	560.00	323.78	140.31

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-213	200.94	J-101a	36.56
J-211	196.18	J-018a	44.99
J-145	190.77	O-RV-3	45.00
J-173	187.98	J-105	60.39
J-102	183.96	PrJ-020	60.39
J-176	183.63	J-114	60.83
J-171a	181.54	R-1	61.97
J-175a	179.73	J-112	64.96
J-072	179.55	T-02a	65.00
J-178	179.30	JT-02	65.00

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
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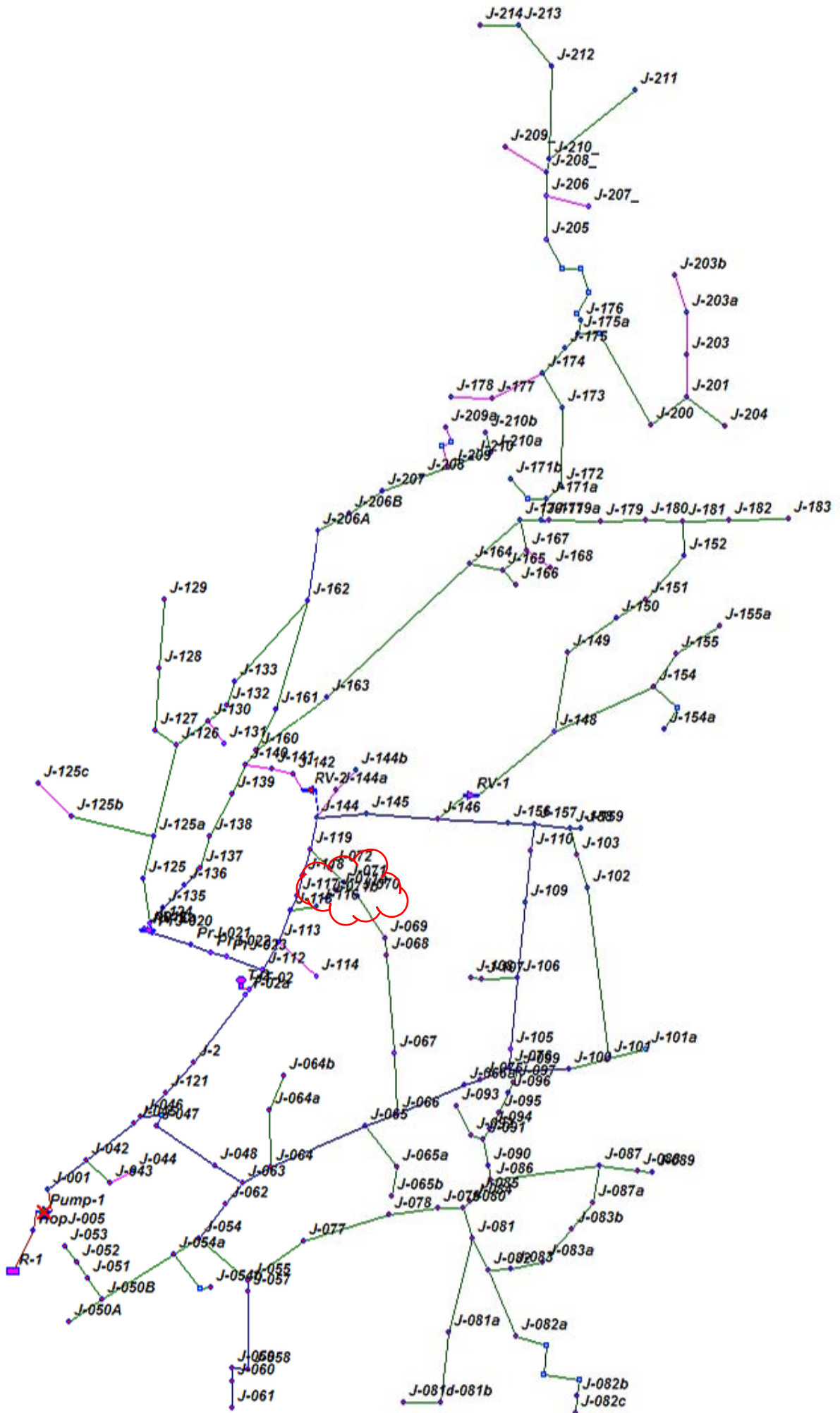
RV-1	PRV-1	67.00	ACTIVATED	127.77	67.00	5.85
RV-2	PRV-1	99.00	WIDE OPEN	137.00	137.00	0.00
RV-3	PRV-1	45.00	ACTIVATED	74.64	45.00	51.15

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
R-1	0.00	Hopkinsville
T-2	236.15	Antioch Rd T
NET SYSTEM INFLOW	= 236.15	
NET SYSTEM OUTFLOW	= 0.00	
NET SYSTEM DEMAND	= 236.15	

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



Christian County Water District – Phase IX System Extension Project
“Dawson Spring Road Tank Zone Area”

Pleasant Grove Road Extension
Hydraulic Comments

Simulation 1

The affected area is modeled with the existing and proposed customers dispersed according to meter reading routes. The line extensions will be served by the District's Dawson Spring Road elevated tank, which has an overflow of 892' and a capacity of 200,000 gallons. The tank is initially set at 885' (7' < overflow). Demands are calculated as follows:

Approximate Number of Customers in the Pressure Zone: 858

Proposed Customers: 1

Existing Peak Purchase Day Demand: *Not available*

Existing Average Day Demand (per CCWD usage data): 0.15 gpm/customer

Existing Customers: $10 \times (\# \text{customers})^{.5} = 10(858)^{.5} = \sim .34 \text{ gpm/each}$

Proposed Customer: $10 \times (\# \text{customers})^{.5} = 10(1)^{.5} = \sim 10.0 \text{ gpm total}$

The model reflects the 0.34 gpm/meter throughout plus an additional 10.0 gpm along the proposed extension(s). The model illustrates that adequate pressure is maintained throughout the majority of the system with a low water level in the tank.

Simulation 2 (Flushing Pleasant Grove Road)

This simulation depicts a flushing instance of the proposed four inch extension along Pleasant Grove Road with a demand of 98 gpm (2.5 ft/sec) placed at the east end (J-20b). This flushing simulation is modeled using the normal operational use of the District's KY Highway 109 Dawson Spring water tank. The four inch line is flushed with a full water tank and normal residential demands throughout. (Q=0.15 gpm/customer per CCWD info listed above)

The model illustrates that adequate pressure is maintained throughout.

An electronic version of the KYPIPE file is available upon request.

* * * * * K Y P I P E * * * * *
 *
 * Pipe Network Modeling Software *
 *
 * CopyRighted by KYPIPE LLC (www.kypipe.com) *
 * Version: 6.025 10/21/2013 *
 * Serial #: 8-5537150 *
 * Interface: Classic *
 * Licensed for Pipe2008 *
 *
 * * * * *

Date & Time: Fri Feb 10 13:59:47 2023

Master File : c:\aa_hydraulics & music\00hydraulics-kypipe\ccwd-black pressure zone\2023-02 phase ix proejct.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

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)
RV-3	PRV-1	891.46

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	N O D E N A M E S		L E N G T H (ft)	D I A M E T E R (in)	R O U G H N E S S C O E F F .	M I N O R L O S S C O E F F .
	#1	#2				
P-5	J-64	J-67	1800.00	6.00	140.0000	0.00
P-10	J-09	J-10	3100.00	8.00	140.0000	0.00
P-12	J-09	J-13	4100.00	6.00	140.0000	0.00
P-14	J-10	J-11	2600.00	6.00	140.0000	0.00
P-15	J-11	J-13	800.00	6.00	140.0000	0.00
P-16	J-13	J-14	6000.00	6.00	140.0000	0.00
P-17	J-14	J-15	5000.00	6.00	140.0000	0.00
P-18	J-16	J-15	2250.00	8.00	140.0000	0.00
P-19	J-17	J-16	3000.00	8.00	140.0000	0.00
P-20	J-05	J-17	11500.00	8.00	140.0000	0.00
P-21	J-11	J-11a	4500.00	6.00	140.0000	0.00
P-22	J-11a	J-11c	4800.00	6.00	140.0000	0.00
P-23	J-11c	J-18	5700.00	6.00	140.0000	0.00
P-24	J-10	T-2	6000.00	8.00	140.0000	0.00
P-25	T-2	J-21	400.00	8.00	140.0000	0.00
P-26	J-21	J-22	2000.00	4.00	140.0000	0.00
P-27	J-21	J-23	1600.00	8.00	140.0000	0.00
P-28	J-23	J-24	2700.00	2.00	140.0000	0.00
P-29	J-24	J-25	2200.00	3.00	140.0000	0.00
P-30	J-23	J-26	1600.00	8.00	140.0000	0.00
P-31	J-26	J-27	1900.00	6.00	140.0000	0.00
P-32	J-26	J-26a	10200.00	8.00	140.0000	0.00

P-33	J-28	J-29	3500.00	4.00	140.0000	0.00
P-34	J-29	J-29a	3300.00	4.00	140.0000	0.00
P-35	J-28	J-31	7500.00	8.00	140.0000	0.00
P-36	J-31	J-32	10500.00	6.00	140.0000	0.00
P-37	J-31	J-33	2200.00	8.00	140.0000	0.00
P-38	J-33	I-RV-3	3000.00	4.00	140.0000	0.00
P-39	O-RV-3	J-35	8000.00	4.00	140.0000	0.00
P-40	J-35	J-36	6000.00	4.00	140.0000	0.00
P-41	J-36	J-37	4000.00	4.00	140.0000	0.00
P-42	J-38	J-36	5700.00	4.00	140.0000	0.00
P-43	J-36	J-39	3000.00	4.00	140.0000	0.00
P-44	J-39	J-40	4000.00	4.00	140.0000	0.00
P-45	J-33	J-41	4900.00	8.00	140.0000	0.00
P-46	J-41a	J-42	1300.00	8.00	140.0000	0.00
P-47	J-30	J-30a	5100.00	4.00	140.0000	0.00
P-48	J-43	J-44	3500.00	4.00	140.0000	0.00
P-49	J-43	J-43a	1400.00	8.00	140.0000	0.00
P-50	J-45	J-46	5000.00	4.00	140.0000	0.00
P-51	J-46	J-47	8000.00	4.00	140.0000	0.00
P-52	J-47	J-48	5500.00	4.00	140.0000	0.00
P-53	J-48	J-49	3600.00	4.00	140.0000	0.00
P-54	J-48	J-50	3000.00	4.00	140.0000	0.00
P-55	J-50	J-51	2250.00	4.00	140.0000	0.00
P-56	J-45	J-52	5500.00	8.00	140.0000	0.00
P-57	J-52	J-53	5200.00	8.00	140.0000	0.00
P-58	J-54	J-53	3200.00	8.00	140.0000	0.00
P-59	J-53	J-55	2500.00	6.00	140.0000	0.00
P-60	J-68	J-67	7000.00	6.00	140.0000	0.00
P-61	J-55	J-56	3500.00	6.00	140.0000	0.00
P-62	J-56	J-57	4000.00	6.00	140.0000	0.00
P-63	J-54	J-58	5000.00	8.00	140.0000	0.00
P-64	J-58	J-59	3200.00	4.00	140.0000	0.00
P-65	J-58	J-60	4300.00	8.00	140.0000	0.00
P-66	J-60	J-61	2000.00	4.00	140.0000	0.00
P-67	J-61	J-62	2200.00	4.00	140.0000	0.00
P-68	J-60	J-63	8300.00	8.00	140.0000	0.00
P-69	J-69	J-68	6500.00	6.00	140.0000	0.00
P-70	J-30a	J-30b	4100.00	4.00	140.0000	0.00
P-71	J-30b	J-30c	5900.00	4.00	140.0000	0.00
P-72	J-65	J-66	4450.00	6.00	140.0000	0.00
P-73	J-66	J-30e	3350.00	6.00	140.0000	0.00
P-74	J-30e	J-30f	1500.00	6.00	140.0000	0.00
P-75	J-30f	J-57e	750.00	6.00	140.0000	0.00
P-76	J-66	J-30d	2600.00	6.00	140.0000	0.00
P-77	J-11a	J-11b	4500.00	4.00	140.0000	0.00
P-79-CV	J-21a	J-70	4200.00	6.00	140.0000	0.00
P-80	J-70	J-71	2400.00	6.00	140.0000	0.00
P-81	J-71	J-72	8500.00	4.00	140.0000	0.00
P-82	J-72	J-73	7000.00	4.00	140.0000	0.00
P-83	J-73	J-74	3500.00	4.00	140.0000	0.00
P-84	J-74	J-75	1300.00	4.00	140.0000	0.00
P-85	J-75	J-76	2800.00	4.00	140.0000	0.00
P-86	J-76	J-77	800.00	4.00	140.0000	0.00
P-87	J-77	J-78	5000.00	4.00	140.0000	0.00
P-88	J-78	J-79	1800.00	4.00	140.0000	0.00
P-89	J-79	J-80	2200.00	4.00	140.0000	0.00
P-90	J-83	J-82	2200.00	2.00	140.0000	0.00
P-91	J-84	J-83	2000.00	6.00	140.0000	0.00
P-002	J-69	J-70	4500.00	6.00	140.0000	0.00
P-01	O-Pump-2	J-01	3000.00	8.00	140.0000	0.00
P-02	J-01	J-02	2655.00	6.00	140.0000	0.00
P-02a	J-02	J-02a	2600.00	3.00	140.0000	0.00
P-03	J-01	J-01b	1850.00	4.00	140.0000	0.00
P-03a	J-01a	J-01c	2800.00	4.00	140.0000	0.00
P-04	J-01	J-01a	1500.00	8.00	140.0000	0.00
P-04a	J-01a	J-03	3500.00	8.00	140.0000	0.00
P-04b	J-03	J-04	300.00	8.00	140.0000	0.00
P-04c	J-04	J-04a	4200.00	8.00	140.0000	0.00
P-04d	J-03a	J-04	1740.00	4.00	140.0000	0.00
P-04e	J-05a	J-03a	3100.00	4.00	140.0000	0.00
P-05a	J-04a	J-05	1000.00	8.00	140.0000	0.00
P-05b	J-04a	J-04b	60.00	1.50	140.0000	0.00
P-05c	J-04b	J-04c	540.00	2.00	140.0000	0.00

P-05d	J-05	J-05a	700.00	4.00	140.0000	0.00
P-05e	J-05a	J-05b	2800.00	4.00	140.0000	0.00
P-05f	J-05b	J-05c	3325.00	4.00	140.0000	0.00
P-06	J-06	J-05	5000.00	8.00	140.0000	0.00
P-07	J-06	J-07	3000.00	4.00	140.0000	0.00
P-07a	J-84	J-21a	800.00	6.00	140.0000	0.00
P-07b	J-21a	J-21b	1600.00	3.00	140.0000	0.00
P-07c	J-21b	J-21c	2400.00	3.00	140.0000	0.00
P-08	J-06	J-08	6500.00	8.00	140.0000	0.00
P-09	J-08	J-09	1800.00	8.00	140.0000	0.00
P-10a	J-73	J-09a	1350.00	3.00	140.0000	0.00
P-10b	J-09a	J-79	3650.00	3.00	140.0000	0.00
P-19a	J-80	J-81	1500.00	4.00	140.0000	0.00
P-19b	J-81	J-82	1500.00	4.00	140.0000	0.00
P-21a	J-18	J-18a	2750.00	3.00	140.0000	0.00
P-21b	J-18a	J-18b	575.00	3.00	140.0000	0.00
P-23a	J-18	J-20	2800.00	4.00	140.0000	0.00
P-23ab	J-20	J-20a	2300.00	4.00	140.0000	0.00
P-23ac	J-20a	J-20b	2100.00	4.00	140.0000	0.00
P-23b	J-18	J-19	3250.00	4.00	140.0000	0.00
P-23c	J-19	J-19a	5000.00	4.00	140.0000	0.00
P-23d	J-19a	J-19b	3700.00	4.00	140.0000	0.00
P-26a	J-22	J-22a	9900.00	4.00	140.0000	0.00
P-26b	J-22a	J-11c	20.00	4.00	140.0000	0.00
P-31a	J-27	J-27a	4100.00	6.00	140.0000	0.00
P-31b	J-27a	J-75	10.00	6.00	140.0000	0.00
P-32a	J-26a	J-28	1800.00	8.00	140.0000	0.00
P-32b	J-26a	J-26b	6900.00	4.00	140.0000	0.00
P-34a	J-29a	J-30	2200.00	4.00	140.0000	0.00
P-34b	J-29a	J-29b	1118.00	3.00	140.0000	0.00
P-42a	J-38	J-38a	15600.00	4.00	140.0000	0.00
P-42b	J-38a	J-38b	3750.00	4.00	140.0000	0.00
P-42c	J-38b	J-38c	4200.00	3.00	140.0000	0.00
P-42d	J-38c	J-38d	4300.00	3.00	140.0000	0.00
P-45a	J-41	J-41a	1800.00	8.00	140.0000	0.00
P-45b	J-41	J-41b	2000.00	3.00	140.0000	0.00
P-47a	J-12	J-42	2500.00	8.00	140.0000	0.00
P-47b	J-12	J-34	1750.00	3.00	140.0000	0.00
P-47c	J-43	J-12	2500.00	8.00	140.0000	0.00
P-47ca	J-34	J-34a	1000.00	3.00	140.0000	0.00
P-48a	J-44	J-44a	2000.00	4.00	140.0000	0.00
P-48b	J-44	J-44b	1400.00	3.00	140.0000	0.00
P-48c	J-44b	J-44c	1185.00	3.00	140.0000	0.00
P-49a	J-43a	J-45	1400.00	8.00	140.0000	0.00
P-49b	J-43a	J-43b	1400.00	4.00	140.0000	0.00
P-55a	J-51	J-51a	350.00	4.00	140.0000	0.00
P-62a	J-57	J-57a	2500.00	6.00	140.0000	0.00
P-62b	J-57a	J-57b	2100.00	6.00	140.0000	0.00
P-62c	J-57b	J-57c	2100.00	6.00	140.0000	0.00
P-62d	J-57c	J-57d	300.00	6.00	140.0000	0.00
P-62e	J-57d	J-57e	10000.00	6.00	140.0000	0.00
P-62f	J-57d	J-57f	1565.00	3.00	140.0000	0.00
P-63c	J-63b	J-63c	2850.00	4.00	140.0000	0.00
P-68a	J-63	J-63a	100.00	2.00	140.0000	0.00
P-68b	J-63a	J-63b	2500.00	4.00	140.0000	0.00
P-71a	J-30c	J-65	10.00	4.00	140.0000	0.00
PH-00	R-1	I-Pump-2	12250.00	8.00	140.0000	0.00

P U M P / L O S S E L E M E N T D A T A

THERE IS A DEVICE AT NODE Pump-2 DESCRIBED BY THE FOLLOWING DATA: (ID= 2)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
370.00	0.00	75.00 (Default)
350.00	350.00	75.00 (Default)
290.00	550.00	75.00 (Default)

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
J-10	KY109&MJ Boy	7.48	650.00	
J-11	MJBoyd&MtZoa	0.51	695.00	
J-12	KY109 & Levi	2.89	533.00	
J-13	MtZoar&DougC	0.00	729.00	
J-14	MtZoar Hi Sp	1.53	680.00	
J-15	West Mt Zoar	2.21	650.00	
J-16	@MtZoar Lath	1.70	685.00	
J-17	Hop-MtZ@Gait	2.55	795.00	
J-18	Start:Please	8.16	654.00	
J-19	Start:OldPal	4.59	634.00	
J-20	Pleas Grv 3"	0.00	630.00	
J-21	KY109&Hart R	1.70	770.00	
J-22	Start:Hart R	2.38	740.00	
J-23	109&Pool-Nan	2.89	760.00	
J-24	Pool-nanny@C	0.68	640.00	
J-25	Pool-nanny E	0.17	694.00	
J-26	Start:KY1026	6.97	756.00	
J-27	Hi:KY 1026	0.85	790.00	
J-28	KY109@Era	4.76	674.00	
J-29	Sandlick Cre	1.02	488.00	
J-30	Start:Mt.Car	0.68	673.00	
J-31	109&Consol-L	5.78	660.00	
J-32	End Consol-L	2.21	562.00	
J-33	KY109 & 800	4.42	637.00	
J-34	Levi North E	0.68	480.00	
J-35	Tradewater R	14.79	430.00	
J-36	1348@AdamsCe	4.25	616.00	
J-37	AdamsStoreEx	2.04	540.00	
J-38	KY1348@T.Col	0.68	420.00	
J-39	Creek	0.00	460.00	
J-40	KY1348 Easte	0.00	560.00	
J-41	Start:109@BP	2.89	615.00	
J-42	KY109@Dawson	1.19	502.00	
J-43	KY109 & 1348	3.23	619.00	
J-44	Start:Barnet	1.36	550.00	
J-45	KY109 & 1338	3.06	566.00	
J-46	KY1338 Hi-sp	4.42	571.00	
J-47	KY1338 PRV	3.91	520.00	
J-48	1338@Hopkins	0.85	443.00	
J-49	End HopkinsP	0.34	471.00	
J-50	1338@TerryCo	0.00	570.00	
J-51	Hopkins Co L	0.00	430.00	
J-52	McKnight Cre	3.06	440.00	
J-53	KY109 X-road	3.91	554.00	
J-54	KY109&KY398	4.93	569.00	
J-55	KY398 X-road	0.00	530.00	
J-56	Macedonia Ch	0.68	581.00	
J-57	Penny State	0.68	678.00	
J-58	KY109&LogBen	4.08	600.00	
J-59	End:LoganBen	1.02	570.00	
J-60	KY109@Beshea	0.17	600.00	
J-61	Creek	1.53	480.00	
J-62	Lake Beshear	1.53	570.00	
J-63	KY109/Outwoo	0.17	600.00	
J-64	US68&1349	1.70	503.00	
J-65	PumpID3	1.02	724.00	
J-66	KY398&Mt.C R	1.53	734.00	
J-67	KY1349&1663	5.27	519.00	
J-68	Pt on Quisen	5.10	555.00	
J-69	KY1349&Shurd	4.42	615.00	
J-70	KY91&1349	7.99	525.00	
J-71	KY91&HarmGrv	8.33	506.00	
J-72	Hi:HarmonyGr	7.14	690.00	
J-73	Start:O.Dani	1.87	666.00	
J-74	HarmGrvCemet	1.87	705.00	
J-75	End:HarmongG	1.87	705.00	

J-76	Start:Dudley	1.02	675.00
J-77	ClarkSt-Sink	1.02	650.00
J-78	Hi:ClarksSto	2.72	594.00
J-79	O.Dan&ClarksS	2.21	557.00
J-80	4"end:Clarks	0.85	635.00
J-81	ClarksStoreC	0.34	560.00
J-82	2"end:Clarks	1.36	620.00
J-83	KY91&ClarksS	2.72	587.00
J-84	KY91&1026	1.70	554.00
J-01	Start:Butmil	14.11	624.00
J-01a	End:Hall@109	2.55	600.00
J-01b	Hall&OldButt	0.51	595.00
J-01c	End:Hall Lan	0.17	560.00
J-02	End:Spain Ln	2.89	590.00
J-02a	End:Spain3"	0.17	605.00
J-03	109@MudyFkCr	1.70	581.00
J-03a	Flush:PleasG	0.17	660.00
J-04	Start:109&Pl	1.53	585.00
J-04a	Start:Terry@	1.87	705.00
J-04b	End:Terry Ln	1.02	710.00
J-04c	End:Terry Ln	1.02	720.00
J-05	Start:PlesGr	9.69	755.00
J-05a	TroyHopson S	0.68	695.00
J-05b	Lo:TroyHopso	1.36	690.00
J-05c	End:TroyHops	0.68	700.00
J-06	KY109&WittyL	11.90	645.00
J-07	Witty Ln End	1.02	620.00
J-08	109@E Fork C	4.93	546.00
J-09	109&DougComb	3.40	560.00
J-09a	End:O.Daniel	0.34	625.00
J-11a	Start:Moore	1.36	597.00
J-11b	End:Moore Rd	0.34	660.00
J-11c	End:Hart Roa	4.42	685.00
J-18a	Low:Pleasant	0.17	630.00
J-18b	End:Pleasant	0.17	650.00
J-19a	Hi:OldPalest	0.68	574.00
J-19b	End:OldPales	0.34	520.00
J-20a	Tradewater C	0.17	480.00
J-20b	End:Pleasant	9.83	530.00
J-21a	Start:Sheppd	4.25	550.00
J-21b	Lo:JC Kelly@	0.85	545.00
J-21c	End:JC Kelly	0.34	560.00
J-22a	Hart:Flush	1.87	685.00
J-26a	Start:PleasG	6.80	702.00
J-26b	End:PleasGrn	0.51	485.00
J-27a	End:KY 1026	0.17	707.00
J-29a	Start:Crow R	1.53	670.00
J-29b	End:Crow Roa	0.34	645.00
J-30a	Mt.Carmel Ch	0.00	741.00
J-30b		0.34	750.00
J-30c	Mt.C&Glover	0.34	724.00
J-30d	End:KY 398So	0.34	753.00
J-30e	Hawkins Area	0.51	759.00
J-30f	High:KY 398	0.51	764.00
J-34a	Levi North E	0.17	490.00
J-38a	Hi:Terry Col	0.00	560.00
J-38b	Start:T.Cole	0.17	500.00
J-38c	End:T.Cole3"	0.34	565.00
J-38d	End:T.Cole3"	0.17	590.00
J-41a	Sandlick Cre	1.02	440.00
J-41b	End:Billy Po	0.34	525.00
J-43a	Start:HambyL	2.38	585.00
J-43b	End:HambyLoo	0.17	575.00
J-44a	KY1348West e	0.34	450.00
J-44b	High:Barnett	0.51	585.00
J-44c	End:Barnett	0.34	545.00
J-51a	So.HopkinsMe	0.00	435.00
J-57a	PFSP:Camp lo	0.00	625.00
J-57b	PFSP:LookTow	0.00	707.00
J-57c	PFSP:Creek L	0.00	565.00
J-57d	KY398&CampRd	0.17	580.00
J-57e	End:KY 398No	0.17	765.00
J-57f	End:Camp Roa	0.17	605.00

J-63a	4x2:NoOut@10	1.02	595.00	
J-63b	End:No Outle	1.87	650.00	
J-63c	End:No Outle	0.85	450.00	
I-Pump-2	KY109 Pump S	0.00	620.00	
R-1	Hopkinsville	----	625.00	758.00
O-RV-3	RV@AdamsStor	----	603.00	891.46
T-2	KY 109 Tank	----	776.00	885.00
I-RV-3	RV@AdamsStor	0.00	603.00	
O-Pump-2	KY109 Pump S	0.00	620.00	

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

OUTPUT SELECTION: THE FOLLOWING RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

ALL CLOSED PIPES ARE NOTED
ALL PIPES WITH PUMPS

FOLLOWING PIPES
P-23a
P-23ab
P-23ac

FOLLOWING JUNCTION NODES
J-18
J-20
J-20a
J-20b

MAXIMUM AND MINIMUM PRESSURES = 15

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

NUMBER OF PIPES(p) = 152
NUMBER OF END NODES(j) = 144
NUMBER OF PRIMARY LOOPS(l) = 7
NUMBER OF SUPPLY NODES(f) = 2
NUMBER OF SUPPLY ZONES(z) = 1

Case: 0

RESULTS OBTAINED AFTER 7 TRIALS: ACCURACY = 0.00034

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)

Phase IX System Extension Project: The 4" line extension will be served by the District's KY 109N elevated tank, which has an overflow of 892 and a capacity of 200,000 gallons. Tank is initially set at 885' (7'<overflow). The model contains existing customers (858) disbursed by approximate route records with peak demands equivalent to $10 \times (\#C)^{.5}$ (.34 gpm/meter) & 1 new customer at node J-20b.

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 #1	NODE #2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/1000 ft/f	HL/1000 ft/f
P-23a	J-18	J-20	10.00	0.26	0.00	0.26	0.09	0.09
P-23ab	J-20	J-20a	10.00	0.21	0.00	0.26	0.09	0.09

P-23ac

J-20a

J-20b

9.83

0.19

0.00

0.25

0.09

0.09

P U M P / L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE	INLET HEAD	OUTLET HEAD	PUMP HEAD	EFFIC-ENCY	USEFUL POWER	INCREMENTL COST	TOTAL COST	#PUMPS PARALLEL	#PUMPS SERIES	NPSH
Avail.	gpm	ft	ft	ft	%	Hp	\$	\$			ft

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

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
J-18	Start:Pleas	8.16	882.67	654.00	228.67	99.09
J-20	Pleas Grv 3"	0.00	882.41	630.00	252.41	109.38
J-20a	Tradewater C	0.17	882.20	480.00	402.20	174.29
J-20b	End:Pleasant	9.83	882.01	530.00	352.01	152.54

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-38	196.18	J-17	38.13
J-51	193.32	J-27	39.69
J-35	192.00	T-2	47.23
J-51a	191.16	J-57e	48.41
J-41a	189.44	J-30f	48.85
J-52	189.24	J-21	49.69
J-48	187.69	J-30e	51.02
J-44a	184.96	J-23	53.52
J-63c	184.83	J-30d	53.62
J-39	178.85	J-26	54.77
J-49	175.56	J-30b	55.14
J-20a	174.29	J-05	55.44
J-34	172.02	R-1	57.63
J-61	171.85	J-30a	59.19
J-26b	171.00	I-Pump-2	59.80

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
RV-3	PRV-1	125.00	WIDE OPEN	118.46	118.46	22.44

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
R-1	0.00	Hopkinsville
T-2	301.72	KY 109 Tank

NET SYSTEM INFLOW = 301.72
 NET SYSTEM OUTFLOW = 0.00
 NET SYSTEM DEMAND = 301.72

=====
 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)

Pleasant Grove Flushing: A 98 gpm demand is placed at the end of the new 4" water line (node J-20b). The tank is reset to the overflow, and the other demands are reset to normal conditions (Typical Usage = 0.15 gpm/cust).

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

TANK at node T-2 has a new HGL of 892.000

RESULTS OBTAINED AFTER 4 TRIALS: ACCURACY = 0.00022

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 NAME	NODE NUMBERS		FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/1000 ft/f	HL/1000 ft/f
	#1	#2						
P-23a	J-18	J-20	98.07	17.69	0.00	2.50	6.32	6.32
P-23ab	J-20	J-20a	98.07	14.53	0.00	2.50	6.32	6.32
P-23ac	J-20a	J-20b	98.00	13.25	0.00	2.50	6.31	6.31

P U M P / L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft	EFFIC-ENCY %	USEFUL POWER Hp	INCREMENTL COST \$	TOTAL COST \$	#PUMPS PARALLEL	#PUMPS SERIES	NPSH ft
Avail.											

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

N O D E R E S U L T S

NODE NODE EXTERNAL HYDRAULIC NODE PRESSURE NODE

NAME	TITLE	DEMAND gpm	GRADE ft	ELEVATION ft	HEAD ft	PRESSURE psi
J-18	Start:Pleas	3.60(0.44)	878.58	654.00	224.58	97.32
J-20	Pleas Grv 3"	0.00	860.89	630.00	230.89	100.05
J-20a	Tradewater C	0.08(0.44)	846.37	480.00	366.37	158.76
J-20b	End:Pleasant	98.00(9.97)	833.12	530.00	303.12	131.35

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-38	203.35	J-17	41.05
J-51	199.34	J-27	43.86
J-35	199.05	T-2	50.27
J-51a	197.17	J-21	52.82
J-41a	195.11	J-57e	54.23
J-52	195.06	J-30f	54.66
J-48	193.71	J-30e	56.83
J-44a	190.74	J-23	57.04
J-63c	190.71	R-1	57.63
J-39	186.02	J-05	58.39
J-49	181.57	J-26	58.67
J-34	177.75	J-30d	59.43
J-61	177.71	I-Pump-2	59.80
J-26b	175.84	J-30b	60.78
J-29	174.45	J-30a	64.71

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
RV-3	PRV-1	125.00	WIDE OPEN	124.39	124.39	9.90

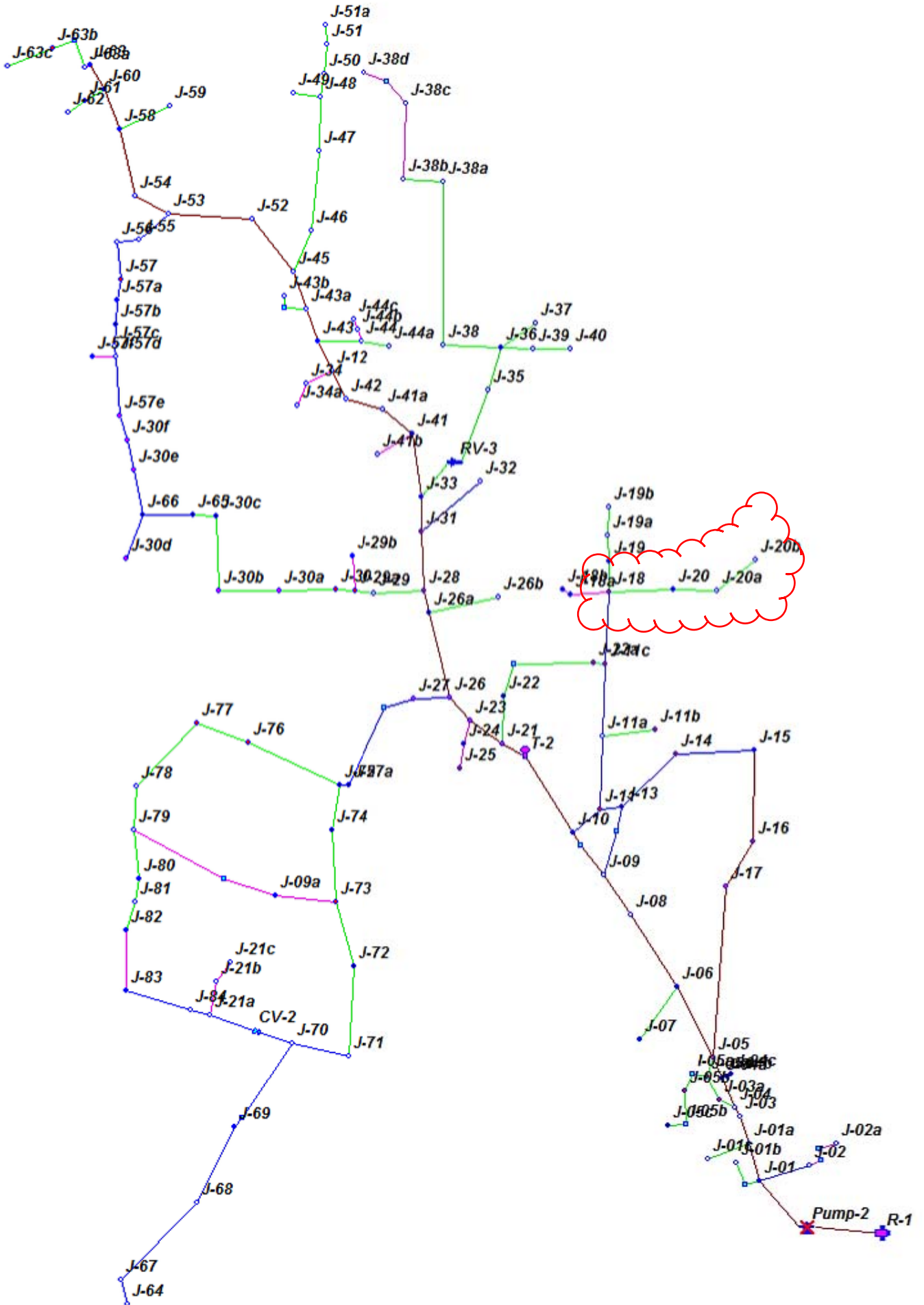
S U M M A R Y O F I N F L O W S A N D O U T F L O W S

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

NODE NAME	FLOWRATE gpm	NODE TITLE
R-1	0.00	Hopkinsville
T-2	226.77	KY 109 Tank

NET SYSTEM INFLOW = 226.77
 NET SYSTEM OUTFLOW = 0.00
 NET SYSTEM DEMAND = 226.77

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



**Christian County Water District – Phase IX System Extension Project
“Greenville Road Area Zone”**

**Root Road Water Line Extensions
Hydraulic Comments**

Simulation 1

The affected area is modeled with the existing and proposed customers dispersed according to meter reading routes. The area is presently served by the District’s Greenville Road elevated water tank (Overflow = 865’). Peak Demands are calculated as follows:

Existing Customers: $10 \times (\# \text{customers})^{.5} = 10(576)^{.5} = \sim .42 \text{ gpm/each}$

Proposed Customer: $10 \times (\# \text{customers})^{.5} = 10(2)^{.5} = \sim 14.1 \text{ gpm total}$

The model reflects the .42 gpm/meter throughout plus an additional 14.1 gpm along the proposed extension. The model illustrates that adequate pressure is maintained throughout with a low water level in the tank.

Simulation 2 (Flushing Root Road)

This simulation depicts a flushing instance of the proposed three inch extension along Root Road with a demand of 55 gpm (2.5 ft/sec) placed at the hydrant location (J-35). This flushing simulation is modeled using the normal operational use of the District’s Greenville Road water tank. The three inch line is flushed with a full water tank and normal residential demands throughout. (Q=0.15 gpm/customer per CCWD records)

An electronic version of the KYPIPE file is available upon request.

* * * * * K Y P I P E * * * * *
 *
 * Pipe Network Modeling Software *
 *
 * CopyRighted by KYPIPE LLC (www.kypipe.com) *
 * Version: 6.025 10/21/2013 *
 * Serial #: 8-5537150 *
 * Interface: Classic *
 * Licensed for Pipe2008 *
 *
 * * * * *

Date & Time: Thu Feb 09 15:24:14 2023

Master File : C:\aa_hydraulics & music\00hydraulics-kypipe\CCWD-Blue Pressure Zone\2022-01 phase ix project.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

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)
RV-4	PRV-1	820.00

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

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

P I P E NAME	N O D E N A M E S		L E N G T H (ft)	D I A M E T E R (in)	R O U G H N E S S C O E F F .	M I N O R L O S S C O E F F .
	#1	#2				
HopP-005	R-1	HopJ-005	10000.00	8.00	140.0000	0.00
HopP-012	I-Pump-1	HopJ-005	500.00	8.00	140.0000	0.00
P-36	J-201	J-201a	1800.00	3.00	140.0000	0.00
P-42	J-030aa	J-031	6900.00	6.00	140.0000	0.00
P-43	J-030aa	J-35	4300.00	3.00	140.0000	0.00
P-124	J-018a	J-124	2250.00	6.00	140.0000	0.00
P-125	J-124	J-125	3500.00	4.00	140.0000	0.00
P-126	J-125	J-126	9500.00	4.00	140.0000	0.00
P-127	J-126	J-127	2000.00	4.00	140.0000	0.00
P-128	J-127	J-127a	1800.00	4.00	140.0000	0.00
P-129	J-128	J-129	5500.00	3.00	140.0000	0.00
P-130	J-126	J-130	2750.00	4.00	140.0000	0.00
P-131	J-130	J-131	2000.00	3.00	140.0000	0.00
P-132	J-130	J-132	1000.00	4.00	140.0000	0.00
P-133	J-132	J-133	2000.00	4.00	140.0000	0.00
P-134	J-133	J-162	3000.00	4.00	140.0000	0.00
P-135	J-124	J-135	3500.00	6.00	140.0000	0.00
P-136	J-135	J-136	5500.00	6.00	140.0000	0.00
P-137	J-136	J-137	4000.00	6.00	140.0000	0.00
P-138	J-138	J-137	4000.00	4.00	140.0000	0.00
P-139	J-139	J-138	1000.00	4.00	140.0000	0.00
P-140	J-140	J-139	1000.00	4.00	140.0000	0.00

P-144	O-RV-4	J-036	500.00	6.00	140.0000	0.00
P-160	J-140	J-160	500.00	4.00	140.0000	0.00
P-161	J-160	J-161	3000.00	4.00	140.0000	0.00
P-162	J-161	J-162	5500.00	4.00	140.0000	0.00
P-185-CV	J-185	J-162	2000.00	6.00	140.0000	0.00
P-186	J-186	J-185	1500.00	6.00	140.0000	0.00
P-187	J-187	J-186	2000.00	6.00	140.0000	0.00
P-188	J-188	J-187	1250.00	6.00	140.0000	0.00
P-189	J-189	J-188	6000.00	6.00	140.0000	0.00
P-190	J-189	J-190	2750.00	6.00	140.0000	0.00
P-191	J-190	J-191	6000.00	6.00	140.0000	0.00
P-192	J-191	J-192	3000.00	6.00	140.0000	0.00
P-193	J-193	J-192	7750.00	6.00	140.0000	0.00
P-194	J-194	J-193	1000.00	6.00	140.0000	0.00
P-195	J-194	J-195	2500.00	6.00	140.0000	0.00
P-196	J-196	J-194	4500.00	6.00	140.0000	0.00
P-197	J-197	J-196	1500.00	4.00	140.0000	0.00
P-198	J-197a	J-197	3300.00	4.00	140.0000	0.00
P-199	J-193	J-199	5000.00	4.00	140.0000	0.00
P-200	J-192	J-200	1000.00	4.00	140.0000	0.00
P-201	J-200	J-201	2750.00	3.00	140.0000	0.00
P-202	J-200	J-202	4500.00	4.00	140.0000	0.00
P-203	J-202	J-203	1000.00	4.00	140.0000	13.00
P-206	J-206A	J-206B	2500.00	4.00	140.0000	0.00
P-207	J-206B	J-207	3000.00	4.00	140.0000	0.00
P-208	J-207	J-208	6000.00	4.00	140.0000	0.00
P-209	J-208	J-209	1000.00	4.00	140.0000	0.00
P-210	J-209	J-210	2500.00	4.00	140.0000	0.00
P-211	J-206A	J-211	3300.00	6.00	140.0000	0.00
P-212	J-211	J-212	4100.00	6.00	140.0000	0.00
P-001	J-001	O-Pump-1	1500.00	8.00	140.0000	0.00
P-002	J-001	J-001a	100.00	8.00	140.0000	0.00
P-002a	J-001a	J-002	4900.00	8.00	140.0000	0.00
P-003	J-003	J-002	500.00	8.00	140.0000	0.00
P-004	J-003	J-003a	2100.00	8.00	140.0000	0.00
P-004a	J-003a	J-004	1400.00	8.00	140.0000	0.00
P-004b	J-003a	J-003b	1350.00	3.00	140.0000	0.00
P-005	J-004	J-005	5500.00	4.00	140.0000	0.00
P-006	J-004	J-006	7500.00	8.00	140.0000	0.00
P-007	J-006	J-007	2000.00	3.00	140.0000	0.00
P-008	J-007	J-008	3500.00	3.00	140.0000	0.00
P-009	J-007	J-009	1500.00	3.00	140.0000	0.00
P-010	J-009	J-010	2000.00	3.00	140.0000	0.00
P-011	J-010	J-011	5000.00	4.00	140.0000	0.00
P-012	J-011	J-012	3500.00	4.00	140.0000	0.00
P-012a	J-012	J-012a	1950.00	3.00	140.0000	0.00
P-013	J-012	J-013	1500.00	4.00	140.0000	0.00
P-014	J-013	J-014	2500.00	4.00	140.0000	0.00
P-015	J-014	J-015	2500.00	4.00	140.0000	0.00
P-016	J-016	J-006	2000.00	8.00	140.0000	0.00
P-016a	J-016	T-01	100.00	8.00	140.0000	0.00
P-017	J-017	J-016	500.00	6.00	140.0000	0.00
P-017a	J-017	J-017a	3375.00	3.00	140.0000	0.00
P-018	J-017	J-018	5000.00	6.00	140.0000	0.00
P-019	J-018	J-019	1500.00	6.00	140.0000	0.00
P-020	J-019	J-020	4500.00	6.00	140.0000	0.00
P-021	J-020	J-021	6000.00	6.00	140.0000	0.00
P-022	J-022	J-021	1500.00	6.00	140.0000	0.00
P-023	J-023	J-022	3500.00	6.00	140.0000	0.00
P-024	J-015	J-023	500.00	6.00	140.0000	0.00
P-025	J-015	J-025	2500.00	4.00	140.0000	0.00
P-026	J-025	J-026	500.00	4.00	140.0000	0.00
P-027	J-025	J-027	1500.00	4.00	140.0000	0.00
P-028	J-027	J-028	2500.00	4.00	140.0000	0.00
P-029	J-015	J-029	2000.00	6.00	140.0000	0.00
P-030	J-029	J-030	7500.00	6.00	140.0000	0.00
P-030a	J-030	J-030a	1100.00	4.00	140.0000	0.00
P-030b	J-030a	J-030b	1525.00	4.00	140.0000	0.00
P-031	J-030	J-030aa	1850.00	6.00	140.0000	0.00
P-032	J-032	J-031	2000.00	6.00	140.0000	0.00
P-033	J-032	J-033	3750.00	6.00	140.0000	0.00
P-034	J-033	J-034	2000.00	4.00	140.0000	0.00
P-035	J-033	I-RV-4	2000.00	6.00	140.0000	0.00

P-037	J-036	J-189	5000.00	6.00	140.0000	0.00
P-038	J-018	J-018a	750.00	6.00	140.0000	0.00
P-039	J-039	J-004	1750.00	6.00	140.0000	0.00
P-040	J-040	J-039	2000.00	6.00	140.0000	0.00
P-041	J-121a	J-040	4200.00	6.00	140.0000	0.00
P-128a	J-127a	J-128	1950.00	3.00	140.0000	0.00
P-129a	J-129	J-129a	1380.00	3.00	140.0000	0.00
P-134a	J-133	J-133a	1500.00	3.00	140.0000	0.00
P-198a	J-198	J-197a	4700.00	4.00	140.0000	0.00
P-198b	J-197a	J-197b	1475.00	3.00	140.0000	0.00
P-198c	J-197b	J-197c	3255.00	3.00	140.0000	0.00
PrP-025	J-162	J-206A	2000.00	6.00	140.0000	0.00
PrP-025b	J-206A	J-162	2000.00	6.00	140.0000	0.00

P U M P / L O S S E L E M E N T D A T A

THERE IS A DEVICE AT NODE Pump-1 DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
256.00	0.00	75.00 (Default)
192.00	460.00	75.00 (Default)
88.00	690.00	75.00 (Default)

N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
HopJ-005	Hop Master M	0.00	541.00	
J-35	End:Root Roa	13.68	578.00	
J-124	KY107&OldF H	5.67	718.00	
J-125	Old Fruit Hi	6.51	670.00	
J-126	Start:Wade R	10.92	530.00	
J-127	Wade Road	4.41	610.00	
J-128	Hi:Wade Road	0.63	620.00	
J-129	Start:Wade 3	0.63	578.00	
J-130	Start:Polete	3.36	600.00	
J-131	End:Polete	0.42	670.00	
J-132	Old Fruit Hi	1.47	560.00	
J-133	Start:Leo Co	4.20	660.00	
J-135	Greenville R	6.93	670.00	
J-136	Greenville R	5.46	678.00	
J-137	Greenville R	3.15	620.00	
J-138	Greenville R	1.89	550.00	
J-139	Greenville R	1.68	580.00	
J-140	KY107@LacyEl	1.89	570.00	
J-160	Fearsville	2.52	560.00	
J-161	Crofton-Frui	3.99	640.00	
J-162	Fruit Hill	7.14	636.00	
J-185	Crofton-Fr H	1.05	570.00	
J-186	Crofton-Fr H	0.42	600.00	
J-187	Crofton-Fr H	0.42	490.00	
J-188	Crofton-Fr H	1.26	530.00	
J-189	KY800&J-Mill	2.10	469.00	
J-190	Crofton-Fr H	1.05	440.00	
J-191	Crofton-Fr H	1.26	580.00	
J-192	KY800&KY1914	1.05	443.00	
J-193	KY800&Flower	2.73	573.00	
J-194	KY800&MacCro	1.89	574.00	
J-195	KY800@Crofto	0.42	570.00	
J-196	MacedoniaCro	1.47	560.00	
J-197	MacedoniaCro	0.21	580.00	
J-198	End:N MacCro	0.63	464.00	
J-199	End:Flowers	1.68	470.00	
J-200	Start:Zentme	0.84	480.00	

J-201	End:Zentmeyer	0.84	490.00	
J-202	Lo:KY1914	0.21	440.00	
J-203	End:KY1914No	0.00	450.00	
J-207	FruitHill-Re	3.15	630.00	
J-208	FruitHill-Re	2.52	490.00	
J-209	FruitHill-Re	1.05	550.00	
J-210	End:FruitH-R	0.63	480.00	
J-211	KY189:Dulin	1.47	590.00	
J-212	Start:KY 189	0.63	640.00	
J-001	Greenville&A	1.68	564.00	
J-001a	Start:Greenv	5.25	564.00	
J-002	Greenville R	5.67	600.00	
J-003	Low:Greenvil	1.05	550.00	
J-003a	Start:Foster	2.52	585.00	
J-003b	End:Foster L	1.26	590.00	
J-004	107&Deason&E	10.29	606.00	
J-005	End:Elgin Ro	2.73	570.00	
J-006	KY107&Wood-h	9.87	767.00	
J-007	Start:Cansle	4.62	650.00	
J-008	End:Cansler	3.15	750.00	
J-009	Woodburn Hay	2.73	620.00	
J-010	Hi:Woodburn	4.20	680.00	
J-011	Lo:Woodburn	3.57	590.00	
J-012	Wood Hay&JMi	2.52	640.00	
J-012a	End:WoodHayE	0.63	685.00	
J-013	Johnson Mill	1.26	680.00	
J-014	Johnson Mill	4.41	640.00	
J-015	Dog-Kel&John	4.41	690.00	
J-016	GreenvilleRd	4.20	780.00	
J-017	Start:SueW@1	5.88	768.00	
J-017a	End:Sue West	0.21	780.00	
J-018	Dogwood	6.51	760.00	
J-018a	End/PRV:Good	1.89	767.00	
J-019	Dogwood-Kell	2.10	710.00	
J-020	Hi:DogwoodKe	2.52	770.00	
J-021	Dogwood-Kell	2.31	690.00	
J-022	Dogwood-Kell	2.52	730.00	
J-023	Dogwood-Kell	1.26	670.00	
J-025	Start:Trails	2.94	690.00	
J-026	End:Dog-Kell	1.68	700.00	
J-027	Lo:Trails En	3.15	650.00	
J-028	End:Trails E	2.31	700.00	
J-029	Hi:Johnson M	1.05	740.00	
J-030	Start:Cavana	1.26	665.00	
J-030a	Lo:Cavanaugh	0.63	655.00	
J-030aa	Start:Root R	1.26	670.00	
J-030b	End:Cavanaug	0.63	685.00	
J-031	Johnson Mill	1.26	548.00	
J-032	Johnson Mill	3.15	660.00	
J-033	J-Mill&MacCr	5.04	627.00	
J-034	End:S Mac-Cr	0.42	550.00	
J-036	Lo:Johnson M	1.26	460.00	
J-039	Hi:Deason	2.52	620.00	
J-040	Deason Lane	1.68	600.00	
J-121a	Deason Valve	0.84	600.00	
J-127a	Wade:4"to3"	0.42	600.00	
J-129a	End: Wade 3"	0.00	570.00	
J-133a	End:Leo Cook	0.42	600.00	
J-197a	MacCroft&Ful	0.63	545.00	
J-197b	Start:Fuller	0.63	525.00	
J-197c	End:Fuller E	0.63	555.00	
J-201a	End:Zentmyer	0.21	490.00	
J-206A	End:FruitHil	3.15	634.00	
J-206B	FruitHill-Re	2.10	560.00	
O-Pump-1	Greeville Rd	0.00	540.00	
R-1	Hopkinsville	----	615.00	758.00
O-RV-4	Johnson Mill	----	550.00	820.00
T-01	GreenvilleRd	----	780.00	855.00
I-RV-4	Johnson Mill	0.00	550.00	
I-Pump-1	Greeville Rd	0.00	540.00	

OUTPUT SELECTION: THE FOLLOWING RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

ALL CLOSED PIPES ARE NOTED
 ALL PIPES WITH PUMPS

FOLLOWING PIPES
 P-43

FOLLOWING JUNCTION NODES
 J-35
 J-030aa

MAXIMUM AND MINIMUM PRESSURES = 10

SYSTEM CONFIGURATION

NUMBER OF PIPES(p) = 108
 NUMBER OF END NODES(j) = 103
 NUMBER OF PRIMARY LOOPS(l) = 4
 NUMBER OF SUPPLY NODES(f) = 2
 NUMBER OF SUPPLY ZONES(z) = 1

=====
 Case: 0

RESULTS OBTAINED AFTER 15 TRIALS: ACCURACY = 0.00000

SIMULATION DESCRIPTION (LABEL)

Phase IX Extension Project: The 3" line extension will be served by the District's Greenville Road elevated tank, which has an overflow of 865' and a capacity of 75,000 gallons. Tank is initially set at 855' (10'<overflow). The model contains existing zone customers (576) disbursed by route records with demands equivalent to $10 \times (\#C)^{.5}$ (.42 gpm/customer) & proposed customers () at $10 \times (\#C)^{.5}$ or ___ gpm total at @ J-35.

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS		FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
	#1	#2						

P-43	J-030aa	J-35	13.68	2.87	0.00	0.62	0.67	0.67
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FOLLOWING ADDITIONAL PIPES ARE CLOSED :
 P-185

PUMP/LOSS ELEMENT RESULTS

NAME Avail.	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft	EFFIC- ENCY %	USEFUL POWER Hp	INCREMENTL COST \$	TOTAL COST \$	#PUMPS PARALLEL	#PUMPS SERIES	NPSH ft
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FOLLOWING ADDITIONAL PIPES ARE CLOSED :

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

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
J-35	End:Root Roa	13.68	829.67	578.00	251.67	109.06
J-030aa	Start:Root R	1.26	832.54	670.00	162.54	70.43

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-190	164.50	J-020	30.17
J-202	164.39	J-017a	31.91
J-192	163.10	J-018a	32.34
J-203	160.06	J-016	32.44
J-036	155.99	T-01	32.50
J-198	153.92	J-018	35.61
J-189	151.97	J-017	37.11
J-210	151.39	J-006	37.95
J-199	151.34	J-029	41.11
J-200	147.06	J-008	41.85

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
RV-4	PRV-1	117.00	ACTIVATED	121.80	117.00	22.89

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
R-1	0.00	Hopkinsville
T-01	256.02	GreenvilleRd

NET SYSTEM INFLOW = 256.02
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 256.02

Root Flushing Simulation: A 55 gpm demand is placed at the end of the new 3" water line (node J-35). The tank is reset to the overflow, and the other demands are reset to normal conditions (PSC Report Avg = .15gpm/cust).

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

TANK at node T-01 has a new HGL of 865.000

RESULTS OBTAINED AFTER 6 TRIALS: ACCURACY = 0.00000

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS		FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
	#1	#2						
P-43	J-030aa	J-35	55.00	37.77	0.00	2.50	8.78	8.78

FOLLOWING ADDITIONAL PIPES ARE CLOSED :
P-185

PUMP/LOSS ELEMENT RESULTS

NAME	FLOWRATE	INLET HEAD	OUTLET HEAD	PUMP HEAD	EFFIC- ENCY	USEFUL POWER	INCREMENTL COST	TOTAL COST	#PUMPS PARALLEL	#PUMPS SERIES	NPSH ft
Avail.	gpm	ft	ft	ft	%	Hp	\$	\$			

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

NODE RESULTS

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
J-35	End:Root Roa	55.00(4.02)	810.62	578.00	232.62	100.80
J-030aa	Start:Root R	0.45(0.36)	848.39	670.00	178.39	77.30

MAXIMUM AND MINIMUM VALUES

PRESSURES

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
J-190	164.64	J-017a	36.61
J-202	164.63	J-016	36.81
J-210	163.87	T-01	36.83

J-192	163.33	J-020	38.01
J-203	160.29	J-018a	40.29
J-208	159.54	J-017	41.81
J-036	156.00	J-006	42.41
J-198	154.22	J-018	43.36
J-189	152.08	J-008	48.25
J-199	151.62	J-029	48.77

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
RV-4	PRV-1	117.00	ACTIVATED	129.21	117.00	8.18

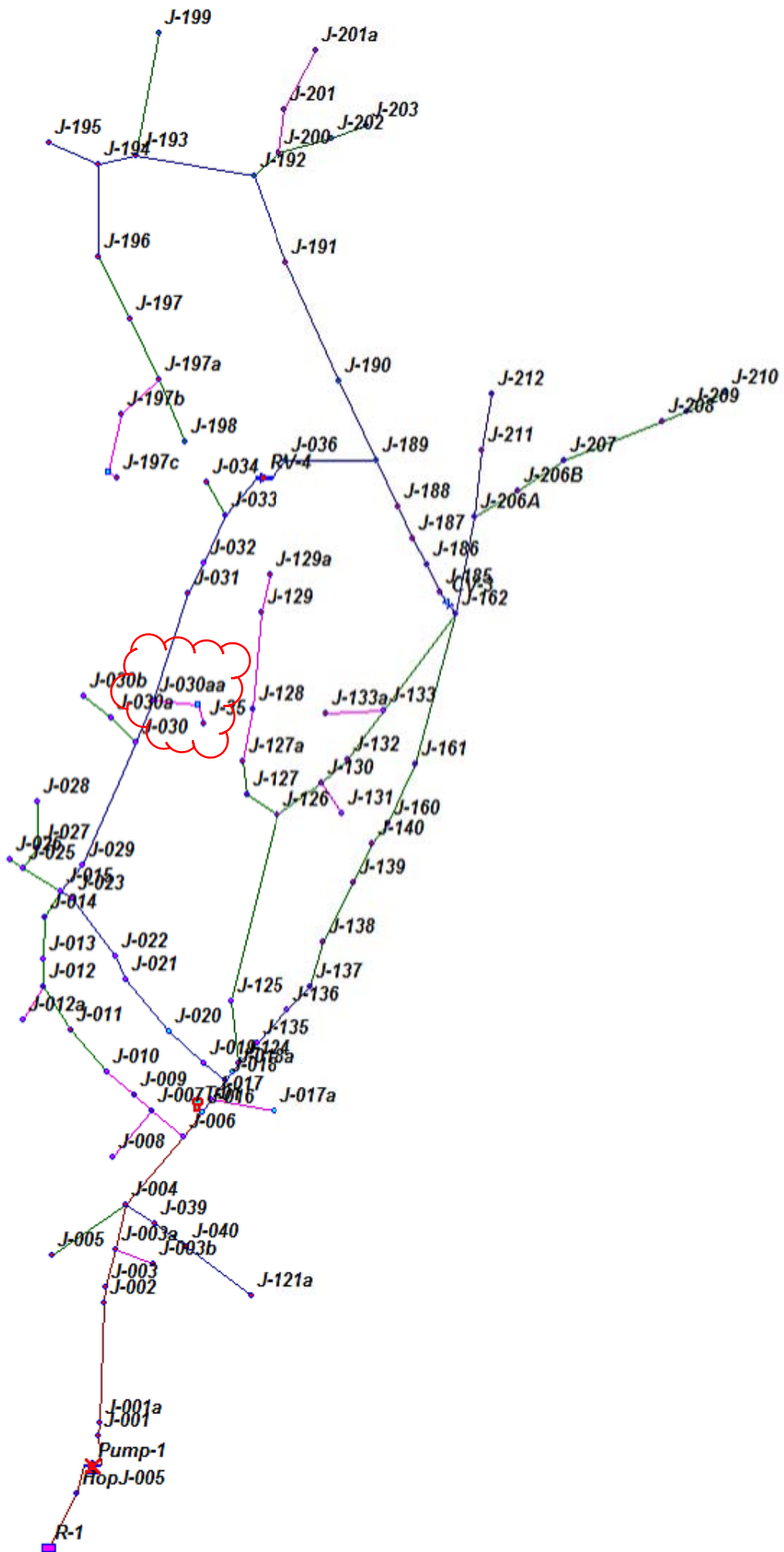
S U M M A R Y O F I N F L O W S A N D O U T F L O W S

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

NODE NAME	FLOWRATE gpm	NODE TITLE
R-1	0.00	Hopkinsville
T-01	141.55	GreenvilleRd

NET SYSTEM INFLOW = 141.55
 NET SYSTEM OUTFLOW = 0.00
 NET SYSTEM DEMAND = 141.55

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



**Christian County Water District – Phase IX System Extension Project
“Herndon Area Zone”**

**Fentress Lane Water Line Extension
Hydraulic Comments**

Simulation 1

The affected area is modeled with the existing and proposed customers dispersed according to meter reading routes. Initially, the City of Hopkinsville’s Industrial Park elevated tank serves the affected pressure zone, with most pressure within the zone being maintained by the District’s KY Highway 107 south elevated water tank. The proposed extension can be served by either tank depending upon particular valving arrangements. Peak Demands are calculated as follows:

Existing Customers: $10 \times (\#customers)^{.5} = 10(525)^{.5} = \sim .44$ gpm/each

Proposed Customers: $10 \times (\#customers)^{.5} = 10(2)^{.5} = 14.1$ gpm total

The model reflects the .44 gpm/meter throughout plus an additional 14.1 gpm along the proposed extension. The model illustrates that adequate pressure is maintained throughout with a low water level in the tank.

Simulation 2 (Flushing Fentress Lane)

This flushing simulation is modeled using the normal operational use of the Hopkinsville Industrial Park Tank and the District’s KY Highway 107 South water tank. This simulation depicts a flushing instance of the proposed 6” extension along Fentress Lane with a demand of 220 gpm (2.5 ft/sec) placed at the end (J-046). The 6” line is flushed with a full water tank and normal residential demands throughout. (Pressure Zone Avg = 0.15 gpm/cust).

The model illustrates that adequate pressure is maintained throughout.

An electronic version of the KYPIPE file is available upon request.

* * * * * K Y P I P E * * * * *
 *
 * Pipe Network Modeling Software *
 *
 * CopyRighted by KYPIPE LLC (www.kypipe.com) *
 * Version: 6.025 10/21/2013 *
 * Serial #: 8-5537150 *
 * Interface: Classic *
 * Licensed for Pipe2008 *
 *
 * * * * *

Date & Time: Thu Feb 09 18:06:19 2023

Master File : c:\aa_hydraulics & music\00hydraulics-kypipe\ccwd-purple pressure zone\2023-01 phase ix project.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	N O D E N A M E S		L E N G T H (ft)	D I A M E T E R (in)	R O U G H N E S S C O E F F .	M I N O R L O S S C O E F F .
	#1	#2				
HP-001	MasterMete	HJ-001	3500.00	12.00	140.0000	0.00
HP-002	HJ-001	HJ-002	2500.00	12.00	140.0000	0.00
HP-003	HJ-002	HJ-003	8000.00	12.00	140.0000	0.00
HP-004	HJ-003	HJ-004	3500.00	8.00	140.0000	0.00
HP-005	HJ-014	HJ-004	9750.00	16.00	140.0000	0.00
HP-006	HJ-014	T-02	4000.00	16.00	140.0000	0.00
P-20	J-007b	J-007c	1150.00	4.00	140.0000	0.00
P-21	J-038	J-038b	1600.00	3.00	140.0000	0.00
P-100	J-022	J-100	1700.00	3.00	140.0000	0.00
P-101	J-067	J-101	1500.00	6.00	140.0000	0.00
P-102	T-01	J-101	1000.00	6.00	140.0000	0.00
P-103	J-007a	J-102	2300.00	4.00	140.0000	0.00
P-104	J-102	J-103	2650.00	4.00	140.0000	0.00
P-105	J-103	J-104	2420.00	4.00	140.0000	0.00
P-106	J-075a	J-074	3500.00	6.00	140.0000	0.00
P-107	J-046a	J-033	3600.00	6.00	140.0000	0.00
P-108	J-046a	J-046	6300.00	6.00	140.0000	0.00
P-001	J-001MasterMete		2250.00	8.00	140.0000	0.00
P-002	J-002	J-001	2000.00	8.00	140.0000	0.00
P-003	J-003	J-002	500.00	8.00	140.0000	0.00
P-004	J-004	J-003	3500.00	8.00	140.0000	0.00
P-005	J-005	J-004	2000.00	8.00	140.0000	0.00
P-006a	J-005	J-006a	3500.00	8.00	140.0000	0.00
P-006b	J-006a	J-006b	2750.00	6.00	140.0000	0.00
P-006bba	J-06	J-006bb	2300.00	8.00	140.0000	0.00
P-006c	J-006bb	J-006c	1750.00	8.00	140.0000	0.00
P-006d	J-006c	J-006d	750.00	4.00	140.0000	0.00
P-006e	J-006c	J-006e	500.00	4.00	140.0000	0.00
P-006f	J-006e	J-006f	2000.00	4.00	140.0000	0.00
P-006g	J-006f	J-006g	1500.00	4.00	140.0000	0.00
P-006h	J-006e	J-006h	1000.00	4.00	140.0000	0.00
P-007	J-006c	J-007	1500.00	8.00	140.0000	0.00

P-008	J-007a	J-007	4500.00	8.00	140.0000	0.00
P-008a	I-Pump-1	J-007a	5000.00	8.00	140.0000	0.00
P-009	O-Pump-1	J-009	3500.00	6.00	140.0000	0.00
P-010	J-009	J-010	100.00	6.00	140.0000	0.00
P-011	J-011	J-010	500.00	6.00	140.0000	0.00
P-012	J-012	J-011	6000.00	6.00	140.0000	0.00
P-013	J-013	J-012	2500.00	6.00	140.0000	0.00
P-014	J-014	J-013	5500.00	6.00	140.0000	0.00
P-015	J-015	J-014	1000.00	6.00	140.0000	0.00
P-016	J-016	J-015	3000.00	6.00	140.0000	0.00
P-017	J-017	J-016	1500.00	6.00	140.0000	0.00
P-018	T-01	J-017	1500.00	6.00	140.0000	0.00
P-019	T-01	J-019	6750.00	6.00	140.0000	0.00
P-020a	J-019	J-020a	3500.00	6.00	140.0000	0.00
P-020b	J-020a	J-020b	2750.00	6.00	140.0000	0.00
P-021a	J-020b	J-021a	6000.00	6.00	140.0000	0.00
P-021b	J-021b	J-021a	500.00	6.00	140.0000	0.00
P-022	J-021b	J-022	500.00	6.00	140.0000	0.00
P-023	J-022	J-023	2000.00	6.00	140.0000	0.00
P-024	J-005	J-024	4500.00	6.00	140.0000	0.00
P-025	J-024	J-025	2500.00	6.00	140.0000	0.00
P-026	J-025	J-026	2000.00	6.00	140.0000	0.00
P-027	J-026	J-027	5250.00	6.00	140.0000	0.00
P-028	J-027	J-028	6500.00	6.00	140.0000	0.00
P-029	J-028	J-029	1800.00	6.00	140.0000	0.00
P-029a	J-029	J-029a	2150.00	4.00	140.0000	0.00
P-029b	J-029a	J-029b	4000.00	4.00	140.0000	0.00
P-030	J-028	J-030	2750.00	6.00	140.0000	0.00
P-031	J-030	J-031	5500.00	6.00	140.0000	0.00
P-032	J-031	J-032	4000.00	6.00	140.0000	0.00
P-033-XX	J-007	J-007b	2000.00	6.00	140.0000	0.00
P-033a	J-007b	J-033a	4100.00	6.00	140.0000	0.00
P-033b	J-033a	J-046a	3300.00	6.00	140.0000	0.00
P-033c	J-033a	J-033b	11200.00	4.00	140.0000	0.00
P-033d	J-033b	J-033c	1200.00	4.00	140.0000	0.00
P-034	J-033	J-034	4000.00	6.00	140.0000	0.00
P-035	J-034	J-035	3750.00	6.00	140.0000	0.00
P-036	J-035	J-036	2000.00	6.00	140.0000	0.00
P-037	J-036	J-037	9500.00	6.00	140.0000	0.00
P-038	J-038	J-037	2000.00	3.00	140.0000	0.00
P-038a	J-038	J-038a	3785.00	3.00	140.0000	0.00
P-039	J-037	J-037a	4750.00	6.00	140.0000	0.00
P-039a	J-037a	J-037b	2900.00	6.00	140.0000	0.00
P-039b	J-037b	J-037c	2700.00	6.00	140.0000	0.00
P-039c	J-037c	J-065	8000.00	6.00	140.0000	0.00
P-039d	J-037c	J-037d	6000.00	4.00	140.0000	0.00
P-040	J-035	J-040	7000.00	4.00	140.0000	0.00
P-041	J-052	J-040	12500.00	4.00	140.0000	0.00
P-042	J-036	J-042	4750.00	4.00	140.0000	0.00
P-043	J-042	J-043	4750.00	4.00	140.0000	0.00
P-043a	J-043	J-043a	1350.00	4.00	140.0000	0.00
P-043b	J-043a	J-043b	4350.00	4.00	140.0000	0.00
P-044	J-043	J-044	3600.00	4.00	140.0000	0.00
P-044a	J-044	J-044a	4940.00	4.00	140.0000	0.00
P-045	J-045	J-009	2500.00	6.00	140.0000	0.00
P-046	J-045	J-046	1000.00	6.00	140.0000	0.00
P-047	J-010	J-047	1000.00	6.00	140.0000	0.00
P-047a	J-047	J-047a	3700.00	6.00	140.0000	0.00
P-047b	J-047a	J-047b	7200.00	6.00	140.0000	0.00
P-047c	J-047b	J-047c	1550.00	4.00	140.0000	0.00
P-047d	J-047c	J-047d	3900.00	4.00	140.0000	0.00
P-048	J-010	J-048	500.00	6.00	140.0000	0.00
P-049	J-048	J-034	13500.00	6.00	140.0000	0.00
P-050	J-034	J-050	9000.00	6.00	140.0000	0.00
P-051	J-050	J-051	3500.00	6.00	140.0000	0.00
P-052	J-051	J-052	2000.00	6.00	140.0000	0.00
P-053	J-053	J-052	4500.00	6.00	140.0000	0.00
P-053a	J-053	J-053a	1300.00	4.00	140.0000	0.00
P-053b	J-053a	J-053b	1500.00	4.00	140.0000	0.00
P-054	J-052	J-054	1750.00	4.00	140.0000	0.00
P-055	J-055	J-011	3000.00	4.00	140.0000	0.00
P-056	J-056	J-055	1750.00	4.00	140.0000	0.00
P-057	J-057	J-056	2250.00	4.00	140.0000	0.00

P-057a	J-057a	J-057	2000.00	4.00	140.0000	0.00
P-057b	J-057a	J-057b	4300.00	4.00	140.0000	0.00
P-058	J-058	J-057a	4500.00	4.00	140.0000	0.00
P-059	J-059	J-058	5000.00	4.00	140.0000	0.00
P-06	J-006a	J-06	1200.00	8.00	140.0000	0.00
P-060	J-059	J-075	7250.00	4.00	140.0000	0.00
P-061	J-059	J-061	1750.00	3.00	140.0000	0.00
P-062	J-016	J-062	2000.00	6.00	140.0000	0.00
P-063	J-062	J-063	6000.00	6.00	140.0000	0.00
P-064	J-064	J-063	4400.00	4.00	140.0000	0.00
P-064a	J-064	J-019	5900.00	4.00	140.0000	0.00
P-065	J-063	J-065	3000.00	6.00	140.0000	0.00
P-066	J-065	J-066	1500.00	4.00	140.0000	0.00
P-067	J-017	J-067	100.00	6.00	140.0000	0.00
P-068	J-068	J-067	4000.00	6.00	140.0000	0.00
P-069	J-069	J-068	2000.00	6.00	140.0000	0.00
P-06a	J-06	J-06a	3000.00	4.00	140.0000	0.00
P-06b	J-06a	J-06b	5600.00	4.00	140.0000	0.00
P-06c	J-06b	J-06c	3350.00	4.00	140.0000	0.00
P-06d	J-06c	J-06d	5850.00	4.00	140.0000	0.00
P-06e	J-06c	J-06e	2300.00	4.00	140.0000	0.00
P-070	J-069	J-070	3500.00	6.00	140.0000	0.00
P-071	J-070	J-071	1500.00	6.00	140.0000	0.00
P-072	J-071	J-071a	1900.00	6.00	140.0000	0.00
P-072a	J-071a	J-071b	1550.00	3.00	140.0000	0.00
P-072b	J-071b	J-071c	1380.00	3.00	140.0000	0.00
P-072c	J-071c	J-071d	1400.00	3.00	140.0000	0.00
P-072d	J-071d	J071e	1200.00	3.00	140.0000	0.00
P-073	J-071a	J-072	600.00	6.00	140.0000	0.00
P-073a	J-072	J-073a	4750.00	6.00	140.0000	0.00
P-073b	J-073a	J-073b	2500.00	3.00	140.0000	0.00
P-074	J-073a	J-074	3000.00	6.00	140.0000	0.00
P-075	J-075	J-075a	2000.00	6.00	140.0000	0.00
P-075a	J-075a	J-075b	5000.00	4.00	140.0000	0.00
P-076	J-075	J-076	4000.00	6.00	140.0000	0.00
P-077	J-077	J-076	4000.00	6.00	140.0000	0.00
P-078	J-078	J-077	1750.00	6.00	140.0000	0.00
P-079	J-078	J-079	250.00	6.00	140.0000	0.00
P-080	J-079	J-080	6000.00	6.00	140.0000	0.00
P-081	J-080	J-081	4750.00	6.00	140.0000	0.00
P-082	J-079	J-082	3000.00	6.00	140.0000	0.00
P-083	J-078	J-083	3000.00	6.00	140.0000	0.00
P-084	J-083	J-084	1000.00	6.00	140.0000	0.00
P-085	J-084	J-085	5250.00	6.00	140.0000	0.00
P-086	J-019	J-019a	1500.00	4.00	140.0000	0.00
P-086a	J-019a	J-086	8000.00	4.00	140.0000	0.00
P-087	J-086	J-087	3000.00	4.00	140.0000	0.00
P-087a	J-087	J-097	3000.00	4.00	140.0000	0.00
P-088	J-021a	J-091	500.00	6.00	140.0000	0.00
P-089	J-090b	J-021b	500.00	6.00	140.0000	0.00
P-090	J-090b	J-090a	500.00	6.00	140.0000	0.00
P-091	J-091	J-090b	500.00	6.00	140.0000	0.00
P-092	J-091	J-092	1000.00	6.00	140.0000	0.00
P-093	J-092	J-093	1600.00	6.00	140.0000	0.00
P-093a	J-093	J-093a	2100.00	4.00	140.0000	0.00
P-093b	J-093a	J-093b	8600.00	4.00	140.0000	0.00
P-094	J-021b	J-094	6000.00	6.00	140.0000	0.00
P-095	J-094	J-095	5000.00	4.00	140.0000	0.00
P-096	J-095	J-096	4750.00	4.00	140.0000	0.00
P-097	J-096	J-097	3250.00	4.00	140.0000	0.00
P-098	J-097	J-097a	2750.00	6.00	140.0000	0.00
P-098a-XX	R-1	J-097a	3450.00	6.00	140.0000	0.00
P-099	J-097	J-099	2750.00	4.00	140.0000	0.00
P-099a	J-099a	J-099	10950.00	4.00	140.0000	0.00
P-099b	J-072	J-099a	3950.00	4.00	140.0000	0.00

P U M P / L O S S E L E M E N T D A T A

THERE IS A DEVICE AT NODE Pump-1 DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD FLOWRATE EFFICIENCY

(ft)	(gpm)	(%)
154.00	0.00	75.00 (Default)
120.00	175.00	75.00 (Default)
65.00	240.00	75.00 (Default)

N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
J071e	End:DyersCha	0.22	570.00	
MasterMete	CCWD:MastMet	0.00	530.00	
HJ-001	Hopkinsville	0.00	550.00	
HJ-002	Hopkinsville	0.00	490.00	
HJ-003	Hopkinsville	0.00	550.00	
HJ-004	Hopkinsville	0.00	525.00	
HJ-014	Hopkinsville	0.00	585.00	
J-100	End:Canton	0.00	550.00	
J-101	Bennetstown	2.86	585.00	
J-102	Start:Stripp	1.10	555.00	
J-103	Hi:StrippedB	0.66	562.00	
J-104	End:Stripped	0.22	510.00	
J-001	KY107@SoFork	4.62	480.00	
J-002	KY107:WestBr	5.06	540.00	
J-003	KY107:WestBr	1.98	516.00	
J-004	Hi:KY 107	1.98	550.00	
J-005	KY107 & KY34	1.54	523.00	
J-006a	KY107&Locust	1.54	513.00	
J-006b	End:LocustGr	0.44	515.00	
J-006bb	KY107@creek	2.20	490.00	
J-006c	KY107&Memory	2.64	536.00	
J-006d	End:Memory W	0.44	545.00	
J-006e	Beverly	0.88	525.00	
J-006f	Lo:Memory E	1.98	505.00	
J-006g	End:Memory E	1.76	515.00	
J-006h	End:Old Palm	0.44	535.00	
J-007	KY107&KY345	3.08	540.00	
J-007a	KY107&StripB	5.72	550.00	
J-007b	Start:BevS@3	3.74	540.00	
J-007c	End:BeverlyS	0.88	530.00	
J-009	KY107&Fentre	5.72	525.00	
J-010	KY107@Herndo	1.54	525.00	
J-011	KY107&LonWal	2.86	515.00	
J-012	Hi:KY107	3.30	560.00	
J-013	KY107&OldLaf	2.42	535.00	
J-014	KY107&Taylor	1.76	565.00	
J-015	Lo:KY107	1.10	540.00	
J-016	Bennettstown	1.54	575.00	
J-017	KY107&KY287	1.76	570.00	
J-019	KY107&FlatLi	3.74	580.00	
J-019a	Start:DyersC	0.44	580.00	
J-020a	Lo:KY107	1.54	560.00	
J-020b	Hi:KY107	8.36	575.00	
J-021a	LaFayette	9.90	550.00	
J-021b	KY107&RoarSp	7.70	540.00	
J-022	KY107&Canton	1.10	540.00	
J-023	End:KY107 S	0.44	550.00	
J-024	Hi:Huffman M	1.76	580.00	
J-025	Lo:HuffmanMi	3.30	470.00	
J-026	Curve:Huffma	3.52	535.00	
J-027	KY345:~CoxMi	2.20	515.00	
J-028	Glass & CoxM	2.20	565.00	
J-029	Start:Cox Mi	1.10	550.00	
J-029a	Start:Asbhy@	0.66	565.00	
J-029b	End:Ashby Rd	0.44	575.00	
J-030	Hi:Glass Lan	1.10	600.00	
J-031	Lo:Glass Lan	1.98	510.00	
J-032	End:Glass La	1.10	542.00	

J-033	Hi:Palmyra(K	1.76	600.00
J-033a	Start:Miller	4.18	540.00
J-033b	MillersMill@	1.10	580.00
J-033c	End:MillersM	0.44	585.00
J-034	KY117&Palmyr	3.96	585.00
J-035	KY345&BellSt	1.32	590.00
J-036	KY345&Darnel	2.86	585.00
J-037	Start:KY345&	3.74	536.00
J-037a	End:Boddie 6	1.10	565.00
J-037b	Boddie&FlemG	0.22	520.00
J-037c	Boddie&Lovel	1.32	530.00
J-037d	End:Lovelady	0.88	535.00
J-038	Start:KY345@	0.66	510.00
J-038a	End:KY345@FC	0.22	505.00
J-038b	End:Wayne Hu	0.00	555.00
J-040	Curve:BellSt	0.88	600.00
J-042	Hi:Darnell	1.54	600.00
J-043	Darnell&Flem	1.32	585.00
J-043a	High:Darnell	0.44	605.00
J-043b	End:Darnell	0.44	575.00
J-044	End:FlemingG	0.44	570.00
J-044a	End:Fleming-	0.22	595.00
J-045	Hi:Fentress	2.64	545.00
J-046	End:Fentress	14.98	540.00
J-046a	Start:Fentre	2.42	580.00
J-047	End:KY117 N	1.32	535.00
J-047a	River:KY 117	1.10	455.00
J-047b	End:KY117&Sw	1.32	580.00
J-047c	Hi:Swift For	0.88	585.00
J-047d	End:Swift Fo	0.66	510.00
J-048	Herndon(KY11	2.42	500.00
J-050	Lo:KY 117	0.44	573.00
J-051	Hi:KY117	0.00	595.00
J-052	KY117&Bell&N	0.44	585.00
J-053	Start:Bullar	0.22	570.00
J-053a	Curve:Bullar	0.44	575.00
J-053b	End:Bullard	0.22	580.00
J-054	End:Newton	0.00	595.00
J-055	Lo:LonnieWal	0.22	465.00
J-056	Curve:Lon Wa	0.00	500.00
J-057	L.Walker/SwF	0.22	521.00
J-057a	Start:JagoTh	1.10	520.00
J-057b	End:JagoThom	0.22	540.00
J-058	Hi:LonnieWal	1.10	560.00
J-059	LonWalk&McCr	1.76	525.00
J-06	Start:Mville	2.64	520.00
J-061	End:McCraw	0.66	510.00
J-062	BennetstownT	0.00	565.00
J-063	Boddie&Taylo	1.54	600.00
J-064	End:Boddie 4	0.44	600.00
J-065	End:Boddie@D	2.42	585.00
J-066	End:Dawson 4	0.88	575.00
J-067	KY287&Bentow	1.76	570.00
J-068	Lo:KY287	1.32	550.00
J-069	Hi:KY287	1.32	565.00
J-06a	End:Masonvil	0.22	535.00
J-06b	Start:MtVern	0.00	560.00
J-06c	Xion:MtVerno	0.66	530.00
J-06d	End:MtVernon	0.44	550.00
J-06e	End:CharlesF	0.22	550.00
J-070	Lo:KY287	0.66	550.00
J-071	Hi:KY287	0.00	580.00
J-071a	Ky287&DyerCh	0.00	565.00
J-071b	Dyers Chap C	0.44	549.00
J-071c	End:Dyers Ch	0.44	560.00
J-071d	Crk:DyersCha	0.22	565.00
J-072	KY287&SimCem	1.54	564.00
J-073a	KY287&Hargro	0.66	560.00
J-073b	End:Hargrove	0.44	540.00
J-074	Hi:KY287	0.00	575.00
J-075	KY287&LonWal	1.32	530.00
J-075a	Start:Simmon	0.44	530.00
J-075b	End:Simmons	0.44	570.00

J-076	KY287&LilRiv	3.08	420.00	
J-077	KY287@Pardee	3.08	530.00	
J-078	KY164&CoxMil	1.32	543.00	
J-079	KY164&Sumner	0.44	540.00	
J-080	KY164@creek	0.88	510.00	
J-081	Newstead PRV	0.44	530.00	
J-082	End:Sumner	0.00	520.00	
J-083	Lo:KY695	0.88	515.00	
J-084	Curve:KY695	1.10	560.00	
J-085	End:KY695 N	0.88	545.00	
J-086	Lo:Flat Lick	0.88	560.00	
J-087	End:Flat Lic	0.44	575.00	
J-090a	End:N Harris	1.32	540.00	
J-090b	LaFay:NHarri	2.64	545.00	
J-091	Lafay:OldCla	4.40	550.00	
J-092	Lo:OldClarks	3.52	530.00	
J-093	Start:OldCla	0.88	540.00	
J-093a	Hi:OldClarks	1.10	560.00	
J-093b	End:OldClark	0.88	530.00	
J-094	Lo:RoaringSp	6.38	560.00	
J-095	Hi:RoaringSp	1.10	595.00	
J-096	Lo:RoaringSp	0.88	570.00	
J-097	RoarSpr&Flat	0.88	580.00	
J-097a	BarkleyMasMe	0.22	585.00	
J-099	End:SimCemet	0.66	560.00	
J-099a	Hi:SimmonsCe	1.98	585.00	
I-Pump-1	KY107BoostPu	0.00	510.00	
R-1	End:BarlkeyT	----	570.00	670.00
T-01	BennetstownS	----	580.00	720.00
T-02	HopIndPark	----	618.00	748.00
O-Pump-1	KY107BoostPu	0.00	510.00	

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

OUTPUT SELECTION: THE FOLLOWING RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

ALL CLOSED PIPES ARE NOTED
ALL PIPES WITH PUMPS

FOLLOWING PIPES
P-108

FOLLOWING JUNCTION NODES
J-046
J-046a

MAXIMUM AND MINIMUM PRESSURES = 10

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

NUMBER OF PIPES(p) = 170
NUMBER OF END NODES(j) = 158
NUMBER OF PRIMARY LOOPS(l) = 10
NUMBER OF SUPPLY NODES(f) = 3
NUMBER OF SUPPLY ZONES(z) = 1

=====
Case: 0

RESULTS OBTAINED AFTER 8 TRIALS: ACCURACY = 0.00016

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)

Phase IX System Extension Project: The 6" line extension will be served by the District's KY 107S elevated tank, which has an overflow of 730 and a

capacity of 125,000 gallons. Tank is initially set at 720' (10'<overflow). The model contains existing customers (525) disbursed by route records with demands equivalent to 10x(#C)^.5 (.44 gpm/customer) & proposed customers (2) at 10x(#C)^.5 or 14.1 gpm total @ J-046.

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE #1	NODE #2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/1000 ft/f	HL/1000 ft/f
P-108	J-046a	J-046	-2.66	0.01	0.00	0.03	0.00	0.00

FOLLOWING ADDITIONAL PIPES ARE CLOSED :
P-033 P-098a

PUMP/LOSS ELEMENT RESULTS

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft	EFFIC-ENCY %	USEFUL POWER Hp	INCREMENTL COST \$	TOTAL COST \$	#PUMPS PARALLEL	#PUMPS SERIES	NPSH Avail. ft

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

NODE RESULTS

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
J-046	End:Fentress	14.98	714.81	540.00	174.81	75.75
J-046a	Start:Fentre	2.42	714.81	580.00	134.81	58.42

MAXIMUM AND MINIMUM VALUES

PRESSESURES

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
J-076	128.44	R-1	43.33
J-025	119.79	J-043a	47.62
J-001	115.81	J-033	49.77
J-047a	112.65	J-042	49.81
HJ-002	111.60	J-040	49.81
J-006bb	111.19	J-063	50.94
J-055	108.39	J-064	50.97
J-006f	104.67	J-044a	51.95
I-Pump-1	102.51	J-054	51.97
J-104	102.51	J-051	51.97

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
R-1	0.00	End:BarlkeyT
T-01	183.28	BennetstownS
T-02	61.82	HopIndPark

NET SYSTEM INFLOW = 245.10
 NET SYSTEM OUTFLOW = 0.00
 NET SYSTEM DEMAND = 245.10

=====
 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)

Fentress Flushing Simulation: A 220 gpm demand is placed at the end of the new 6" water line (node J-046). The tank is reset to the overflow, and the other demands are reset to normal conditions (PSC Report Avg = .15gpm/cust).

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Pipe P-046 is CLOSED
 TANK at node T-01 has a new HGL of 730.000
 TANK at node T-02 has a new HGL of 758.000

RESULTS OBTAINED AFTER 4 TRIALS: ACCURACY = 0.00002

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 #1	NODE #2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/1000 ft/f	HL/1000 ft/f
P-108	J-046a	J-046	220.00	24.66	0.00	2.50	3.91	3.91

FOLLOWING ADDITIONAL PIPES ARE CLOSED :
 P-033 P-046 P-098a

P U M P / L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft	EFFIC-ENCY %	USEFUL POWER Hp	INCREMENTL COST \$	TOTAL COST \$	#PUMPS PARALLEL	#PUMPS SERIES	NPSH ft
Avail.											

=====
 FOLLOWING ADDITIONAL PIPES ARE CLOSED :

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

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
J-046	End:Fentress	220.00(**)	629.17	540.00	89.17	38.64
J-046a	Start:Fentre	0.83(0.34)	653.83	580.00	73.83	31.99

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-076	131.98	J-033	29.66
J-025	124.71	J-033c	29.82
J-001	120.42	J-033b	31.99
HJ-002	116.11	J-046a	31.99
J-006bb	116.05	J-043a	36.50
J-006f	109.55	J-040	37.50
J-047a	108.23	J-046	38.64
I-Pump-1	107.38	J-042	38.67
J-104	107.38	J-051	38.98
J-031	107.36	J-054	39.00

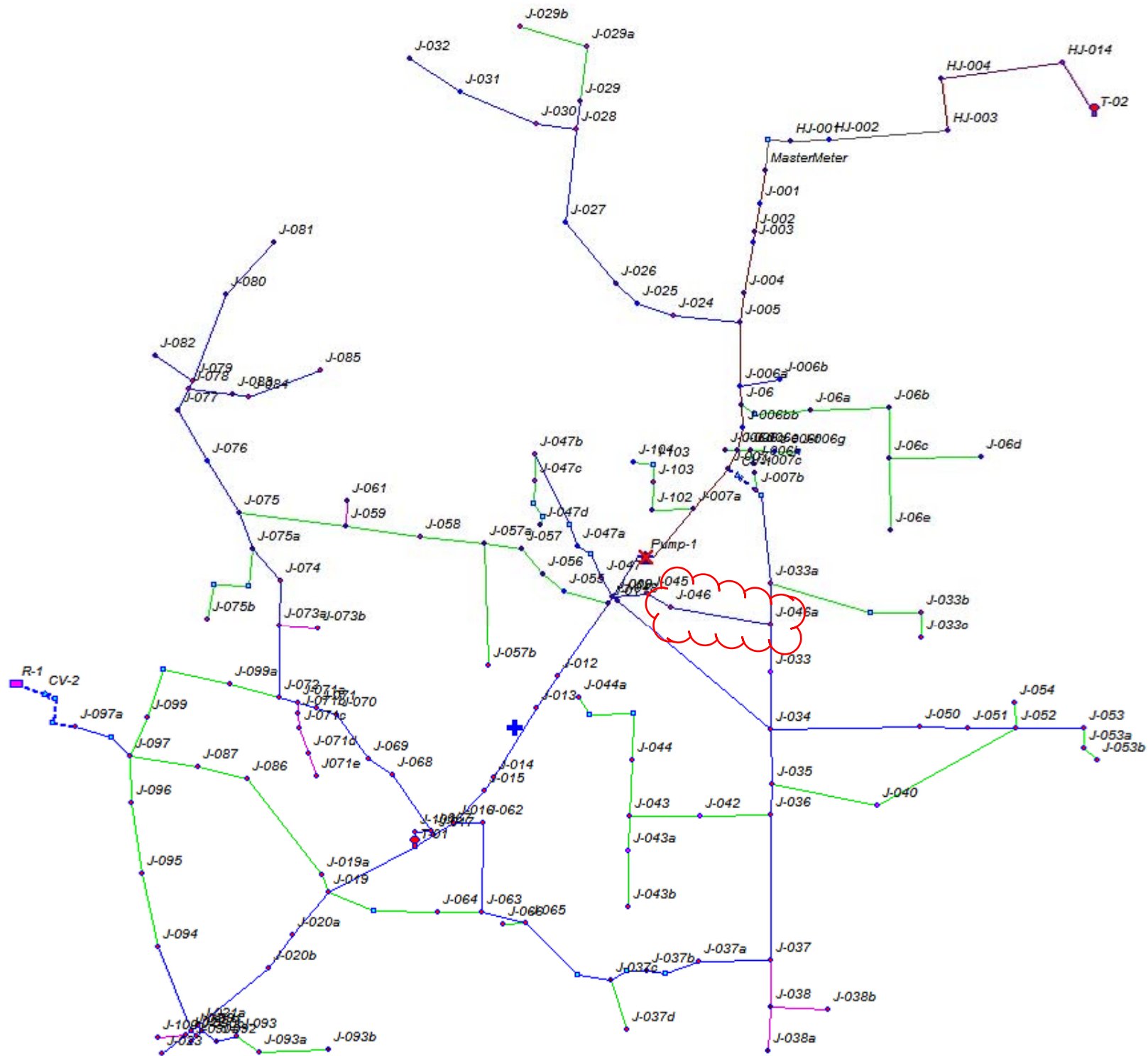
S U M M A R Y O F I N F L O W S A N D O U T F L O W S

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

NODE NAME	FLOWRATE gpm	NODE TITLE
R-1	0.00	End:BarlkeyT
T-01	277.38	BennetstownS
T-02	21.08	HopIndPark

NET SYSTEM INFLOW = 298.45
 NET SYSTEM OUTFLOW = 0.00
 NET SYSTEM DEMAND = 298.45

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



**Christian County Water District – Phase IX System Extension Project
“Pembroke Area Zone”**

**Carneal Lane, Pace Lane Pruitt Lane, Long Lane and Hoover Lane
Water Line Extensions
Hydraulic Comments**

Simulation 1

The affected area is modeled with the existing and proposed customers dispersed according to meter reading routes. Initially, the City of Hopkinsville’s Industrial Park elevated tank serves the affected pressure zone, with pressure within the zone being maintained by the District’s Pembroke Road south elevated water tank, which has an overflow of 838 and a capacity of 125,000 gallons.. The proposed extensions can be served by either tank depending upon particular valving arrangements. Peak Demands are calculated as follows:

Approximate Number of Customers in the Pressure Zone: 568
Existing Peak Purchase Day Demand: *Not available*

Existing Customers: $10x(\#customers)^{.5} = 10(568)^{.5} = \sim .42$ gpm/each

Proposed Customers: 2 (Pruitt) + 12 (Long) + 4 (Hoover) + 5 (Caneal) + 2 (Pace) = 25
 $10x(\#customers)^{.5} = 10(25)^{.5} = \sim 2.0$ gpm/each

The model reflects the .42 gpm/meter throughout plus an additional 2.0 gpm/meter along the proposed extensions. The model illustrates that adequate pressure is maintained throughout with a low water level in the tank.

Simulation 2 (Flushing Pruitt Lane)

This simulation depicts a flushing instance of the proposed four inch extension along Pruitt Lane with a demand of 98 gpm (2.5 ft/sec) placed at the hydrant location (J-011c). This flushing simulation is modeled using the normal operational use of the District’s Pembroke Road water tank. The four inch line is flushed with a full water tank and normal residential demands throughout. (Q=0.15 gpm/customer per CCWD records)

Simulation 3 (Flushing Long Lane)

This simulation depicts a flushing instance of the proposed four inch extension along Long Lane with a demand of 98 gpm (2.5 ft/sec) placed at the hydrant location (J-86). This flushing simulation is modeled using the normal operational use of the District’s Pembroke Road water tank. The four inch line is flushed with a full water tank and normal residential demands throughout. (Q=0.15 gpm/customer per CCWD records)

Simulation 4 (Flushing Hoover Lane)

This simulation depicts a flushing instance of the proposed three inch extension along Hoover Lane with a demand of 55 gpm (2.5 ft/sec) placed at the hydrant location (J-065b). This flushing simulation is modeled using the normal operational use of the District’s Pembroke Road water tank. The three inch line is flushed with a full water tank and normal residential demands throughout. (Q=0.15 gpm/customer per CCWD records)

Simulation 5 (Flushing Carneal Lane)

This simulation depicts a flushing instance of the proposed four inch extension along Carneal Lane with a demand of 98 gpm (2.5 ft/sec) placed at the hydrant location (J-90). This flushing simulation is modeled using the normal operational use of the District's Pembroke Road water tank. The four inch line is flushed with a full water tank and normal residential demands throughout. (Q=0.15 gpm/customer per CCWD records)

Simulation 6 (Flushing Pace Lane)

This simulation depicts a flushing instance of the proposed four inch extension along Pace Lane with a demand of 98 gpm (2.5 ft/sec) placed at the hydrant location (J-88). This flushing simulation is modeled using the normal operational use of the District's Pembroke Road water tank. The four inch line is flushed with a full water tank and normal residential demands throughout. (Q=0.15 gpm/customer per CCWD records)

An electronic version of the KYPIPJE file is available upon request.

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* * * * * K Y P I P E * * * * *
*
* Pipe Network Modeling Software
*
* CopyRighted by KYPIPE LLC (www.kypipe.com)
* Version: 6.025 10/21/2013
* Serial #: 8-5537150
* Interface: Classic
* Licensed for Pipe2008
*
* * * * *

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Date & Time: Thu Feb 09 17:34:28 2023

Master File : c:\aa_hydraulics & music\00hydraulics-kypipe\ccwd-dark green pressure zone\2023-01 phase ix - pembroke.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

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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

PIPE NAME	NODE NAMES #1	NODE NAMES #2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
HopP-001	T-001	J-38	50.00	12.00	140.0000	0.00
P-29	J-022a	J-36	1800.00	4.00	140.0000	0.00
P-81	J-027a	J-027b	3500.00	4.00	140.0000	0.00
P-82	J-38	Hop-001	5500.00	12.00	140.0000	0.00
P-83	J-033	J-49	1800.00	6.00	140.0000	0.00
P-84	J-019d	J-41	3200.00	4.00	140.0000	0.00
P-85	J-011d	J-023	4100.00	6.00	140.0000	0.00
P-86	J-85	J-016a	7500.00	4.00	140.0000	0.00
P-87	J-008	J-86	11500.00	4.00	140.0000	0.00
P-88	J-86	J-85	50.00	4.00	140.0000	0.00
P-89	J-41	J-88	4300.00	4.00	140.0000	0.00
P-90	J-001	J-90	5600.00	4.00	140.0000	0.00
P-001	J-002	J-001	2250.00	6.00	140.0000	0.00
P-002	J-003	J-002	1500.00	6.00	140.0000	0.00
P-003	J-004	J-003	1500.00	6.00	140.0000	0.00
P-004	J-004	J-005	1800.00	6.00	140.0000	0.00
P-005	J-005	J-006	3000.00	4.00	140.0000	0.00
P-006	J-006	J-007	2000.00	4.00	140.0000	0.00
P-007	J-007	J-008	1750.00	4.00	140.0000	0.00
P-008	J-008	J-009	3500.00	4.00	140.0000	0.00
P-009	J-009	J-010	2000.00	4.00	140.0000	0.00
P-010	J-010	J-011	1500.00	4.00	140.0000	0.00
P-010a	J-010	J-010a	1800.00	4.00	140.0000	0.00
P-010b	J-010a	J-010b	8375.00	4.00	140.0000	0.00
P-010c	CC-10	J-010b	100.00	4.00	140.0000	0.00
P-011	J-011	J-011a	4000.00	4.00	140.0000	0.00
P-011a	J-011a	J-012	2000.00	4.00	140.0000	0.00
P-011b	J-011a	J-011b	1200.00	4.00	140.0000	0.00
P-011c	J-011b	J-011c	1450.00	4.00	140.0000	0.00
P-011d	J-011c	J-011d	651.00	4.00	140.0000	0.00
P-012	J-012	J-013	2750.00	4.00	140.0000	0.00
P-013	J-013	J-14	3000.00	4.00	140.0000	0.00
P-013a	J-14	J-14a	4400.00	4.00	140.0000	0.00
P-013b	J-14a	J-14b	6300.00	4.00	140.0000	0.00

P-013c	J-14b	J-024	4800.00	4.00	140.0000	0.00
P-014	J-015	J-005	3500.00	6.00	140.0000	0.00
P-015	J-015	J-016	4800.00	6.00	140.0000	0.00
P-015a	J-016	J-85	3300.00	4.00	140.0000	0.00
P-016	J-016	J-017	1800.00	4.00	140.0000	0.00
P-017	J-017	J-018	3100.00	4.00	140.0000	0.00
P-018	J-018	J-019	3500.00	4.00	140.0000	0.00
P-018a	J-019	J-019a	1250.00	4.00	140.0000	0.00
P-018b	J-019a	J-019b	800.00	4.00	140.0000	0.00
P-018c	J-019b	J-019c	1450.00	4.00	140.0000	0.00
P-018d	J-019c	J-019d	550.00	4.00	140.0000	0.00
P-019	J-019	J-020	3200.00	4.00	140.0000	0.00
P-020	J-018	J-021	1675.00	3.00	140.0000	0.00
P-021	J-022	J-004	2600.00	6.00	140.0000	0.00
P-021a	J-022	J-022a	4100.00	4.00	140.0000	0.00
P-021b	J-022a	J-022b	2900.00	4.00	140.0000	0.00
P-021c	J-022b	J-022c	500.00	4.00	140.0000	0.00
P-021d	J-022c	J-022d	850.00	4.00	140.0000	0.00
P-021e	J-022c	J-022e	2300.00	3.00	140.0000	0.00
P-021f	J-022d	J-022f	2750.00	4.00	140.0000	0.00
P-022	J-023	J-022	12500.00	6.00	140.0000	0.00
P-022a	J-023a	J-023	11100.00	4.00	140.0000	0.00
P-022b	J-023b	J-023a	7500.00	4.00	140.0000	0.00
P-022c	J-024c	J-023b	2300.00	4.00	140.0000	0.00
P-022d	J-023a	J-023c	7250.00	4.00	140.0000	0.00
P-023	J-024	J-011d	5600.00	6.00	140.0000	0.00
P-023a	J-024	J-024a	275.00	4.00	140.0000	0.00
P-023b	J-024a	J-024b	1100.00	4.00	140.0000	0.00
P-023c	J-024b	J-024c	7200.00	4.00	140.0000	0.00
P-023d	J-024c	J-024d	8150.00	4.00	140.0000	0.00
P-024	J-025	J-024	16000.00	6.00	140.0000	0.00
P-025	J-025	J-026	6200.00	6.00	140.0000	0.00
P-026	J-025	J-027	3250.00	6.00	140.0000	0.00
P-027	J-027	J-027a	3800.00	4.00	140.0000	0.00
P-028	J-027a	J-028	1700.00	4.00	140.0000	0.00
P-029	J-028	J-029	2000.00	4.00	140.0000	0.00
P-029a	J-030	J-034	5500.00	6.00	140.0000	0.00
P-029b	J-025	J-030	1500.00	6.00	140.0000	0.00
P-030	J-030	J-031	6750.00	6.00	140.0000	0.00
P-031	J-031	J-032	7000.00	6.00	140.0000	0.00
P-032	J-032	J-033	2250.00	6.00	140.0000	0.00
P-033	J-026	J-034	4200.00	6.00	140.0000	0.00
P-033a	J-026	J-026a	5100.00	4.00	140.0000	0.00
P-033b	J-026a	J-026b	3400.00	4.00	140.0000	0.00
P-034	J-035	J-034	3000.00	6.00	140.0000	0.00
P-035-CV	Hop-001	J-035	147.00	6.00	140.0000	0.00
P-036-XX	T-002	J-035	5200.00	6.00	140.0000	0.00
P-037	Hop-001	I-Pump-1	100.00	6.00	140.0000	0.00
P-038	J-039	O-Pump-1	3200.00	6.00	140.0000	0.00
P-039	J-040	J-039	1000.00	6.00	140.0000	0.00
P-040	J-040	T-002	10.00	6.00	140.0000	0.00
P-041	J-039	J-042	1000.00	6.00	140.0000	0.00
P-042	J-042	J-043	1500.00	6.00	140.0000	0.00
P-043	J-043	J-044	3000.00	6.00	140.0000	0.00
P-044	J-044	J-045	2750.00	6.00	140.0000	0.00
P-045	J-046	J-045	1500.00	6.00	140.0000	0.00
P-046	J-047	J-046	2500.00	6.00	140.0000	0.00
P-047	J-047	J-048	2750.00	6.00	140.0000	0.00
P-048	J-048	J-062	500.00	6.00	140.0000	0.00
P-049	J-048	J-050	600.00	4.00	140.0000	0.00
P-050	J-044	J-051	3250.00	6.00	140.0000	0.00
P-051	J-051	J-052	4000.00	6.00	140.0000	0.00
P-052	J-053	J-052	6500.00	6.00	140.0000	0.00
P-053	J-054	J-053	1750.00	6.00	140.0000	0.00
P-054	J-054	J-055	750.00	6.00	140.0000	0.00
P-055	J-055	J-056	2000.00	6.00	140.0000	0.00
P-056	J-052	J-057	4500.00	6.00	140.0000	0.00
P-057	J-058	J-057	2500.00	6.00	140.0000	0.00
P-058	J-059	J-058	1500.00	6.00	140.0000	0.00
P-059	J-064	J-059	6250.00	6.00	140.0000	0.00
P-060	J-061	J-060	1000.00	6.00	140.0000	0.00
P-061	J-062	J-061	4250.00	6.00	140.0000	0.00
P-062	J-062	J-063	6750.00	6.00	140.0000	0.00
P-063	J-063	J-063a	3850.00	6.00	140.0000	0.00
P-063a	J-063a	J-064	650.00	6.00	140.0000	0.00

P-063b	J-063a	J-063b	5900.00	4.00	140.0000	0.00
P-064	J-064	J-065	2300.00	6.00	140.0000	0.00
P-064a	J-066	J-066a	500.00	6.00	140.0000	0.00
P-065	J-066a	J-067	9500.00	6.00	140.0000	0.00
P-065a	J-065	J-066	5300.00	6.00	140.0000	0.00
P-065b	J-065	J-065a	1000.00	4.00	140.0000	0.00
P-065c	J-065a	J-065b	4500.00	3.00	140.0000	0.00
P-066	J-067	J-070	5000.00	6.00	140.0000	0.00
P-067	J-070	J-071	750.00	6.00	140.0000	0.00
P-068	J-071	J-072	4000.00	6.00	140.0000	0.00
P-069	J-072	J-073	10500.00	6.00	140.0000	0.00
P-070	J-073	J-074	1750.00	6.00	140.0000	0.00
P-071	J-074	J-075	4250.00	4.00	140.0000	0.00
P-071a	J-075	J-081	2750.00	4.00	140.0000	0.00
P-072	J-074	J-076	4750.00	6.00	140.0000	0.00
P-073	J-077	J-076	2750.00	6.00	140.0000	0.00
P-074	J-077	J-078	3500.00	4.00	140.0000	0.00
P-075	J-077	J-079	4750.00	6.00	140.0000	0.00
P-076	J-081	J-080	8300.00	6.00	140.0000	0.00
P-077	J-081	J-082	1150.00	6.00	140.0000	0.00
P-078	J-082	J-083	5450.00	6.00	140.0000	0.00
P-078e	J-067	J-068	3400.00	4.00	140.0000	0.00
P-079	J-083	J-084	5800.00	6.00	140.0000	0.00
P-079a	J-069b	J-069	4750.00	4.00	140.0000	0.00
P-079b-XX	J-084	J-069b	3150.00	4.00	140.0000	0.00
P-080	J-084	J-066a	6700.00	6.00	140.0000	0.00
P-29a	J-36	J-37	4080.00	4.00	140.0000	0.00
P-77a	J-082	J-069a	4750.00	4.00	140.0000	0.00
P-78b	J-069a	J-069	7000.00	4.00	140.0000	0.00
P-78c	J-069	J-068a	800.00	4.00	140.0000	0.00
P-78d	J-068a	J-068	1250.00	4.00	140.0000	0.00
pc-24	CC-07	CC-22	3200.00	4.00	140.0000	0.00
pc-25	CC-22	CC-23	2215.00	3.00	140.0000	0.00
pc-26	CC-22	CC-24	4500.00	4.00	140.0000	0.00
pc-27	CC-24	CC-25	4550.00	4.00	140.0000	0.00
PC-01	CC-01	CC-02	5100.00	4.00	140.0000	0.00
PC-02	CC-02	CC-03	5000.00	4.00	140.0000	0.00
PC-03	CC-03	CC-04	1550.00	4.00	140.0000	0.00
PC-04	CC-04	CC-05	2000.00	4.00	140.0000	0.00
PC-05	CC-05	CC-06	2300.00	4.00	140.0000	0.00
PC-06	CC-06	CC-07	1260.00	4.00	140.0000	0.00
PC-07	CC-04	CC-08	5200.00	4.00	140.0000	0.00
PC-08	CC-08	CC-09	2400.00	4.00	140.0000	0.00
PC-09	CC-09	CC-10	1660.00	4.00	140.0000	0.00
PC-09a	CC-09	CC-09a	3900.00	4.00	140.0000	0.00
PC-09b	CC-09a	CC-09b	3000.00	4.00	140.0000	0.00
PC-09c	CC-09b	J-016a	100.00	4.00	140.0000	0.00
pc-24a	CC-22	CC-23a	2900.00	4.00	140.0000	0.00
pc-24b	CC-23a	CC-23b	3700.00	4.00	140.0000	0.00
pc-25a	CC-23	cc-23aa	2300.00	3.00	140.0000	0.00

P U M P / L O S S E L E M E N T D A T A

THERE IS A DEVICE AT NODE Pump-1 DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
128.00	0.00	75.00 (Default)
112.00	125.00	75.00 (Default)
70.00	200.00	75.00 (Default)

N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
CC-10	Anderson Ex	0.84	570.00	
CC-22	X-ion:Guinn&	1.47	595.00	

CC-23	High:Guinn	0.84	600.00
CC-24	Creek:USHwy4	1.05	535.00
CC-25	End:41@Pembr	0.63	605.00
CC-01	Mason 6x4 Re	1.26	560.00
CC-02	Mason @ Cree	2.10	515.00
CC-03	Mason Rd Hig	1.47	582.00
CC-04	Mason & KY14	2.31	580.00
CC-05	Curve1:KY145	0.63	562.00
CC-06	Curve2:KY145	0.42	565.00
CC-07	Start:US41&H	0.42	579.00
CC-08	KY1453@Creek	1.89	560.00
CC-09	KY1453&Andrs	1.47	554.00
CC-09a	Start:H.Dick	0.42	590.00
CC-09b	End:H.Dicker	0.42	520.00
CC-23a	End:A.C.Cook	1.68	585.00
cc-23aa	End:Guinn	0.21	560.00
CC-23b	End:Stokes T	1.47	585.00
Hop-001	Hop-CCWD Met	0.00	604.00
J-14	KY115&LongPo	0.42	583.00
J-36	Hi:Salem-Bra	1.05	602.00
J-37	End:Salem-Br	0.84	585.00
J-38		0.00	618.00
J-41	Start/End:Pa	1.05	530.00
J-49	End:J.Rivers	0.21	590.00
J-85	Long&How.Dic	1.26	525.00
J-86	Long:Flush	21.48	525.00
J-88	End:Pace/Car	3.58	530.00
J-90	End:Carneal/	8.95	540.00
J-001	Start:Carnea	2.10	560.00
J-002		1.47	559.00
J-003		1.26	520.00
J-004	KY 109& KY11	3.99	542.00
J-005	Int Hwy115 &	3.99	555.00
J-006		0.21	598.00
J-007		0.63	540.00
J-008	KY115&Long	3.15	580.00
J-009		0.21	560.00
J-010	Anderson&KY1	0.63	585.00
J-010a	Hi:Anderson	0.84	590.00
J-010b	End:Anderson	0.63	565.00
J-011		0.84	550.00
J-011a	Pruitt&KY115	0.63	575.00
J-011b	Hi:Pruitt La	0.63	600.00
J-011c	End:Pruitt L	4.21	565.00
J-011d	KY109&Pruitt	1.68	572.00
J-012		0.21	600.00
J-013		0.42	575.00
J-015		3.15	558.00
J-016	Start:H.Dick	2.10	547.00
J-016a	End:H.Dicker	0.63	525.00
J-017		2.10	533.00
J-018	Int BarkersM	3.36	545.00
J-019	Int BarkersM	1.47	524.00
J-019a	End:Bumpus M	0.42	515.00
J-019b	High:BumpusM	0.00	555.00
J-019c	Pace&BumpMil	0.21	505.00
J-019d	End/Start:Pa	0.84	520.00
J-020		0.42	450.00
J-021	End:Turner R	0.84	545.00
J-022	KY109 & St.E	3.15	598.00
J-022a	Start:Salem-	1.05	575.00
J-022b	High:St. Elm	0.21	602.00
J-022c	Start:Frank	0.42	586.00
J-022d	Start:St. El	0.42	570.00
J-022e	End:Frank Wa	0.21	610.00
J-022f	Curve:St Elm	0.21	565.00
J-023	KY109&P-F Rd	2.73	578.00
J-023a	KY756&P-Fid	1.68	584.00
J-023b	Hi:KY Hwy 75	0.84	605.00
J-023c	End:Fidelio	0.42	585.00
J-024	KY109&Longpo	3.57	598.00
J-024a	Start:Long P	0.63	590.00
J-024b	Curve:Long P	1.05	610.00
J-024c	LongPond&Fid	1.89	594.00
J-024d	End:Long Pon	0.84	560.00

J-025	KY109 & Cask	5.04	569.00	
J-026	109&H.Berry	7.35	564.00	
J-026a	Start:HarryB	0.42	580.00	
J-026b	End:HarryBer	0.21	550.00	
J-027	6x4:JohnRive	1.47	540.00	
J-027a	Start:JohnRi	1.89	555.00	
J-027b	End:JohnRivS	0.21	580.00	
J-028	Hi:JohnRiver	1.68	560.00	
J-029	End:JohnRive	1.05	540.00	
J-030	Int CaskyLn	2.73	586.00	
J-031		1.47	573.00	
J-032		1.05	630.00	
J-033	Start:J.Riv	0.21	620.00	
J-034	Caskey & CSX	8.19	608.00	
J-035	US41&CaskeyL	0.84	604.00	
J-039		11.76	651.00	
J-040	Tank Base	11.13	600.00	
J-042		1.26	610.00	
J-043		4.41	635.00	
J-044	Int EdwardsM	4.41	607.00	
J-045		0.42	582.00	
J-046		1.47	600.00	
J-047		3.36	530.00	
J-048		3.99	580.00	
J-050		1.26	560.00	
J-051	Int OldEd'sM	0.42	561.00	
J-052	Int OldEd'sM	1.89	585.00	
J-053		2.10	650.00	
J-054		1.05	620.00	
J-055		1.05	640.00	
J-056		0.63	598.00	
J-057		0.63	630.00	
J-058		0.21	590.00	
J-059		1.26	625.00	
J-060		0.00	572.00	
J-061		1.89	550.00	
J-062	Int 68-80 &	5.04	576.00	
J-063		2.73	600.00	
J-063a	Start:Old Bu	1.47	560.00	
J-063b	End:Old Butl	1.05	610.00	
J-064	Int 68-80 &	1.89	559.00	
J-065	Start:Hoover	1.68	567.00	
J-065a	Hoover:4x3	1.26	575.00	
J-065b	End:Hoover3"	7.16	630.00	
J-066	Little River	0.84	575.00	
J-066a	Start:Rostwn	3.36	580.00	
J-067	Int 68-80 &	9.03	664.00	
J-068	Start:Beeker	0.63	660.00	
J-068a	Hi:Beeker	0.63	700.00	
J-069	Beeker&Champ	2.94	680.00	
J-069a	Curve:Beeker	4.20	605.00	
J-069b	End:ChampHwy	0.21	655.00	
J-070	Hwy115 & 68-	8.61	620.00	
J-071	KY115:Fairvi	2.52	640.00	
J-072	Hi:KY115	2.73	640.00	
J-073	Hi:KY115	1.89	635.00	
J-074	Hwy115 & Ham	1.89	611.00	
J-075	Creek:Hammac	0.84	565.00	
J-076	Hwy115 & Bel	1.05	617.00	
J-077	Hwy115 & Bon	0.84	570.00	
J-078	End:Bond Roa	0.84	597.00	
J-079	End:KY115S	0.00	595.00	
J-080	End:Rosetown	1.68	600.00	
J-081	RosetownRd &	1.89	605.00	
J-082	Int Rosetown	2.94	585.00	
J-083	Mid:Rosetown	2.31	629.00	
J-084	Rostwn&Champ	2.73	670.00	
J-14a	Hi:Long Pond	0.42	590.00	
J-14b	Hi:LongPondC	0.42	600.00	
O-Pump-1	CCWD:41SPump	0.00	600.00	
T-001	Hop. Ind. Pk	----	618.00	748.00
T-002	CCWD:CaskyST	----	650.00	828.00
I-Pump-1	CCWD:41SPump	0.00	600.00	

OUTPUT OPTION DATA

OUTPUT SELECTION: THE FOLLOWING RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

ALL CLOSED PIPES ARE NOTED
ALL PIPES WITH PUMPS

FOLLOWING PIPES

P-87
P-88
P-89
P-90
P-011d
P-065c

FOLLOWING JUNCTION NODES

J-41
J-85
J-86
J-88
J-90
J-001
J-008
J-011c
J-011d
J-065a
J-065b

MAXIMUM AND MINIMUM PRESSURES = 10

SYSTEM CONFIGURATION

NUMBER OF PIPES(p) = 159
NUMBER OF END NODES(j) = 147
NUMBER OF PRIMARY LOOPS(l) = 11
NUMBER OF SUPPLY NODES(f) = 2
NUMBER OF SUPPLY ZONES(z) = 1

Case: 0

RESULTS OBTAINED AFTER 8 TRIALS: ACCURACY = 0.00002

SIMULATION DESCRIPTION (LABEL)

Phase IX System Extension Project: The **3" & 4"** line extensions will be served by the Hopkinsville Industrial Drive elevated tank, which has an overflow of 758 and a capacity of 2,000,000 gallons. The tank is initially set at 748' (10'<overflow). The model contains existing customers (**568**) disbursed by route records with demands equivalent to $10 \times (\#C)^{.5}$ (.42 gpm/customer) & proposed customers (25) at $10 \times (\#C)^{.5}$ or **50 gpm** total at various nodes.

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE #1	NODE #2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/1000 ft/f	HL/1000 ft/f
P-87	J-008	J-86	12.54	1.61	0.00	0.32	0.14	0.14
P-88	J-86	J-85	-8.94	0.00	0.00	0.23	0.07	0.07
P-89	J-41	J-88	3.58	0.06	0.00	0.09	0.01	0.01
P-90	J-001	J-90	8.95	0.42	0.00	0.23	0.07	0.07

P-011d	J-011c	J-011d	-25.86	0.35	0.00	0.66	0.53	0.53
P-065c	J-065a	J-065b	7.16	0.91	0.00	0.32	0.20	0.20

FOLLOWING ADDITIONAL PIPES ARE CLOSED :
P-036 P-079b

P U M P / L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE	INLET HEAD	OUTLET HEAD	PUMP HEAD	EFFIC-ENCY	USEFUL POWER	INCREM TL COST	TOTAL COST	#PUMPS PARALLEL	#PUMPS SERIES	NPSH
Avail.	gpm	ft	ft	ft	%	Hp	\$	\$			ft

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

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
J-41	Start/End:Pa	1.05	702.21	530.00	172.21	74.63
J-85	Long&How.Dic	1.26	702.71	525.00	177.71	77.01
J-86	Long:Flush	21.48	702.71	525.00	177.71	77.01
J-88	End:Pace/Car	3.58	702.15	530.00	172.15	74.60
J-90	End:Carneal/	8.95	704.10	540.00	164.10	71.11
J-001	Start:Carnea	2.10	704.52	560.00	144.52	62.63
J-008	KY115&Long	3.15	704.32	580.00	124.32	53.87
J-011c	End:Pruitt L	4.21	711.57	565.00	146.57	63.52
J-011d	KY109&Pruitt	1.68	711.92	572.00	139.92	60.63
J-065a	Hoover:4x3	1.26	816.38	575.00	241.38	104.60
J-065b	End:Hoover3"	7.16	815.48	630.00	185.48	80.37

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-047	125.42	CC-25	41.21
J-061	116.45	J-022e	41.33
J-051	112.45	CC-23	43.37
J-050	112.15	J-022b	44.80
J-064	111.97	J-36	44.80
J-063a	111.56	CC-22	45.55
J-020	109.38	J-024b	45.61
J-065	108.09	J-006	46.07
J-075	107.83	J-022	46.57
J-060	106.91	J-032	46.69

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
T-001	157.08	Hop. Ind. Pk
T-002	131.48	CCWD:CaskyST

NET SYSTEM INFLOW = 288.56
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 288.56

Case: 1

CHANGES FOR NEXT SIMULATION (Change Number = 1)

Pruitt Flushing Simulation: A 98 gpm demand is placed at the end of the new 4" water line (node J-011c). The tanks are reset to the overflow, and the other demands are reset to normal conditions (Typ. User Avg = .15gpm/cust).

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Pipe P-011c is CLOSED
TANK at node T-001 has a new HGL of 758.000
TANK at node T-002 has a new HGL of 838.000

RESULTS OBTAINED AFTER 4 TRIALS: ACCURACY = 0.00002

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS		FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/1000 ft/f	HL/1000 ft/f
	#1	#2						
P-87	J-008	J-86	2.54	0.08	0.00	0.06	0.01	0.01
P-88	J-86	J-85	2.54	0.00	0.00	0.06	0.01	0.01
P-89	J-41	J-88	0.00	0.00	0.00	0.00	0.00	0.00
P-90	J-001	J-90	0.00	0.00	0.00	0.00	0.00	0.00
P-011d	J-011c	J-011d	-98.00	4.11	0.00	2.50	6.31	6.31
P-065c	J-065a	J-065b	0.00	0.00	0.00	0.00	0.00	0.00

FOLLOWING ADDITIONAL PIPES ARE CLOSED :
P-011c P-036 P-079b

PUMP/LOSS ELEMENT RESULTS

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft	EFFIC-ENCY %	USEFUL POWER Hp	INCREMENTL COST \$	TOTAL COST \$	#PUMPS PARALLEL	#PUMPS SERIES	NPSH avail. ft

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

NODE RESULTS

NODE	NODE	EXTERNAL	HYDRAULIC	NODE	PRESSURE	NODE
------	------	----------	-----------	------	----------	------

NAME	TITLE	DEMAND gpm	GRADE ft	ELEVATION ft	HEAD ft	PRESSURE psi
J-41	Start:End:Pa	0.38(0.36)	720.39	530.00	190.39	82.50
J-85	Long&How.Dic	0.45(0.36)	720.46	525.00	195.46	84.70
J-86	Long:Flush	0.00(0.00)	720.46	525.00	195.46	84.70
J-88	End:Pace/Car	0.00(0.00)	720.39	530.00	190.39	82.50
J-90	End:Carneal/	0.00(0.00)	720.50	540.00	180.50	78.22
J-001	Start:Carnea	0.75(0.36)	720.50	560.00	160.50	69.55
J-008	KY115&Long	1.13(0.36)	720.54	580.00	140.54	60.90
J-011c	End:Pruitt L	98.00(**)	716.59	565.00	151.59	65.69
J-011d	KY109&Pruitt	0.60(0.36)	720.70	572.00	148.70	64.44
J-065a	Hoover:4x3	0.45(0.36)	836.52	575.00	261.52	113.32
J-065b	End:Hoover3"	0.00(0.00)	836.52	630.00	206.52	89.49

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-047	132.98	J-022e	47.89
J-061	124.28	CC-25	49.85
J-064	120.31	J-024b	49.95
J-050	119.95	J-022b	51.35
J-063a	119.88	J-36	51.35
J-051	119.61	J-023b	51.36
J-075	117.49	J-032	51.73
J-020	117.17	CC-23	52.02
J-065	116.79	J-011b	52.69
J-077	115.32	J-012	52.83

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
T-001	140.45	Hop. Ind. Pk
T-002	44.40	CCWD:CaskyST

NET SYSTEM INFLOW = 184.85
 NET SYSTEM OUTFLOW = 0.00
 NET SYSTEM DEMAND = 184.85

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)

Long Flushing Simulation: A 98 gpm demand is placed at the end of the new 4" water line (node J-86). The tanks are reset to the overflow, and the other demands are reset to normal conditions (Typ. User Avg = .15gpm/cust).

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Pipe P-011c is OPENED
 Pipe P-88 is CLOSED

RESULTS OBTAINED AFTER 4 TRIALS: ACCURACY = 0.00072

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS		FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
	#1	#2						
P-87	J-008	J-86	98.00	72.54	0.00	2.50	6.31	6.31
P-88-XX	J-86	J-85						
P-89	J-41	J-88	0.00	0.00	0.00	0.00	0.00	0.00
P-90	J-001	J-90	0.00	0.00	0.00	0.00	0.00	0.00
P-011d	J-011c	J-011d	-30.64	0.48	0.00	0.78	0.73	0.73
P-065c	J-065a	J-065b	0.00	0.00	0.00	0.00	0.00	0.00

FOLLOWING ADDITIONAL PIPES ARE CLOSED :
P-036 P-079b

PUMP/LOSS ELEMENT RESULTS

NAME	FLOWRATE	INLET HEAD	OUTLET HEAD	PUMP HEAD	EFFIC-ENCY	USEFUL POWER	INCREMENTL COST	TOTAL COST	#PUMPS PARALLEL	#PUMPS SERIES	NPSH Avail.
	gpm	ft	ft	ft	%	Hp	\$	\$			ft

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

NODE RESULTS

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
J-41	Start/End:Pa	0.38(0.36)	711.20	530.00	181.20	78.52
J-85	Long&How.Dic	0.45(0.36)	710.93	525.00	185.93	80.57
J-86	Long:Flush	98.00(4.56)	627.02	525.00	102.02	44.21
J-88	End:Pace/Car	0.00(0.00)	711.20	530.00	181.20	78.52
J-90	End:Carneal/	0.00(0.00)	712.30	540.00	172.30	74.66
J-001	Start:Carnea	0.75(0.36)	712.30	560.00	152.30	66.00
J-008	KY115&Long	1.12(0.36)	699.55	580.00	119.55	51.81
J-011c	End:Pruitt L	0.00(0.00)	720.88	565.00	155.88	67.55
J-011d	KY109&Pruitt	0.60(0.36)	721.35	572.00	149.35	64.72
J-065a	Hoover:4x3	0.45(0.36)	836.52	575.00	261.52	113.32
J-065b	End:Hoover3"	0.00(0.00)	836.52	630.00	206.52	89.49

MAXIMUM AND MINIMUM VALUES

PRESSURES

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
J-047	132.98	J-86	44.21
J-061	124.28	J-022e	44.86
J-064	120.31	CC-25	45.17
J-050	119.95	J-006	46.88
J-063a	119.88	CC-23	47.34
J-051	119.61	J-022b	48.33

J-075	117.49	J-36	48.33
J-065	116.79	CC-22	49.51
J-077	115.32	J-024b	49.98
J-060	114.74	J-022	50.07

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
T-001	140.22	Hop. Ind. Pk
T-002	44.40	CCWD:CaskyST

NET SYSTEM INFLOW = 184.62
 NET SYSTEM OUTFLOW = 0.00
 NET SYSTEM DEMAND = 184.63

=====
 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)

Hoover Flushing Simulation: A 55 gpm demand is placed at the end of the new 3" water line (node J-065b). The tanks are reset to the overflow, and the other demands are reset to normal conditions (Typ. User Avg = .15gpm/cust).

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Pipe P-88 is OPENED

RESULTS OBTAINED AFTER 7 TRIALS: ACCURACY = 0.00020

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 / 1 0 0 0 ft/f	H L / 1 0 0 0 ft/f
	#1	#2						
P-87	J-008	J-86	2.10	0.06	0.00	0.05	0.01	0.01
P-88	J-86	J-85	2.10	0.00	0.00	0.05	0.01	0.01
P-89	J-41	J-88	0.00	0.00	0.00	0.00	0.00	0.00
P-90	J-001	J-90	0.00	0.00	0.00	0.00	0.00	0.00
P-011d	J-011c	J-011d	-5.52	0.02	0.00	0.14	0.03	0.03
P-065c	J-065a	J-065b	55.00	39.53	0.00	2.50	8.78	8.78

FOLLOWING ADDITIONAL PIPES ARE CLOSED :
 P-036 P-079b

P U M P / L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE	INLET HEAD	OUTLET HEAD	PUMP HEAD	EFFIC-ENCY	USEFUL POWER	INCREMENTL COST	TOTAL COST	#PUMPS PARALLEL	#PUMPS SERIES	NPSH Avail.
	gpm	ft	ft	ft	%	Hp	\$	\$			ft

=====
 FOLLOWING ADDITIONAL PIPES ARE CLOSED :

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

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
J-41	Start/End:Pa	0.38(0.36)	754.56	530.00	224.56	97.31
J-85	Long&How.Dic	0.45(0.36)	754.62	525.00	229.62	99.50
J-86	Long:Flush	0.00(0.00)	754.62	525.00	229.62	99.50
J-88	End:Pace/Car	0.00(0.00)	754.56	530.00	224.56	97.31
J-90	End:Carneal/	0.00(0.00)	754.70	540.00	214.70	93.04
J-001	Start:Carnea	0.75(0.36)	754.70	560.00	194.70	84.37
J-008	KY115&Long	1.12(0.36)	754.68	580.00	174.68	75.69
J-011c	End:Pruitt L	0.00(0.00)	755.18	565.00	190.18	82.41
J-011d	KY109&Pruitt	0.60(0.36)	755.20	572.00	183.20	79.38
J-065a	Hoover:4x3	0.45(0.36)	825.85	575.00	250.85	108.70
J-065b	End:Hoover3"	55.00(7.68)	786.32	630.00	156.32	67.74

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-020	131.98	J-032	55.08
J-047	130.72	J-068a	55.32
J-061	121.78	J-033	59.41
J-051	117.62	J-38	60.67
J-050	117.49	T-001	60.67
J-064	117.13	J-022e	62.72
J-063a	116.73	J-024b	63.02
J-075	113.82	J-069	63.99
J-065	113.12	CC-25	64.62
J-060	112.25	J-034	64.73

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
T-001	42.45	Hop. Ind. Pk
T-002	99.40	CCWD:CaskyST

NET SYSTEM INFLOW = 141.85
 NET SYSTEM OUTFLOW = 0.00
 NET SYSTEM DEMAND = 141.85

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)

Carneal Flushing Simulation: A 98 gpm demand is placed at the end of the new 4" water line (node J-90). The tanks are reset to the overflow, and the other demands are reset to normal conditions (Typ. User Avg = .15gpm/cust).

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

RESULTS OBTAINED AFTER 4 TRIALS: ACCURACY = 0.00030

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE #1	NODE #2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/1000 ft/f	HL/1000 ft/f
P-87	J-008	J-86	7.36	0.60	0.00	0.19	0.05	0.05
P-88	J-86	J-85	7.36	0.00	0.00	0.19	0.05	0.05
P-89	J-41	J-88	0.00	0.00	0.00	0.00	0.00	0.00
P-90	J-001	J-90	98.00	35.32	0.00	2.50	6.31	6.31
P-011d	J-011c	J-011d	-22.78	0.28	0.00	0.58	0.42	0.42
P-065c	J-065a	J-065b	0.00	0.00	0.00	0.00	0.00	0.00

FOLLOWING ADDITIONAL PIPES ARE CLOSED :
P-036 P-079b

PUMP/LOSS ELEMENT RESULTS

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft	EFFIC-ENCY %	USEFUL POWER Hp	INCREM TL COST \$	TOTAL COST \$	#PUMPS PARALLEL	#PUMPS SERIES	NPSH ft
Avail.											

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

NODE RESULTS

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
J-41	Start/End:Pa	0.38(0.36)	709.85	530.00	179.85	77.93
J-85	Long&How.Dic	0.45(0.36)	710.48	525.00	185.48	80.37
J-86	Long:Flush	0.00(0.00)	710.48	525.00	185.48	80.38
J-88	End:Pace/Car	0.00(0.00)	709.85	530.00	179.85	77.93
J-90	End:Carneal/	98.00(**)	669.72	540.00	129.72	56.21
J-001	Start:Carnea	0.75(0.36)	705.05	560.00	145.05	62.85
J-008	KY115&Long	1.13(0.36)	711.08	580.00	131.08	56.80
J-011c	End:Pruitt L	0.00(0.00)	720.89	565.00	155.89	67.55
J-011d	KY109&Pruitt	0.60(0.36)	721.16	572.00	149.16	64.64
J-065a	Hoover:4x3	0.45(0.36)	836.52	575.00	261.52	113.32
J-065b	End:Hoover3"	0.00(0.00)	836.52	630.00	206.52	89.49

MAXIMUM AND MINIMUM VALUES

PRESSURES

JUNCTION NUMBER	MAXIMUM PRESSURES	JUNCTION NUMBER	MINIMUM PRESSURES

	psi		psi
J-047	132.98	J-022e	43.89
J-061	124.28	CC-25	45.87
J-064	120.31	J-022b	47.36
J-050	119.95	J-36	47.36
J-063a	119.88	CC-23	48.04
J-051	119.61	J-006	48.70
J-075	117.49	J-022	49.10
J-065	116.79	J-024b	49.92
J-077	115.32	CC-22	50.21
J-060	114.74	J-023b	51.12

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
T-001	140.45	Hop. Ind. Pk
T-002	44.40	CCWD:CaskyST

NET SYSTEM INFLOW = 184.85
 NET SYSTEM OUTFLOW = 0.00
 NET SYSTEM DEMAND = 184.85

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)

Pace Flushing Simulation: A 98 gpm demand is placed at the end of the new 4" water line (node J-88). The tanks are reset to the overflow, and the other demands are reset to normal conditions (Typ. User Avg = .15gpm/cust).

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

RESULTS OBTAINED AFTER 4 TRIALS: ACCURACY = 0.00000

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						
P-87	J-008	J-86	16.75	2.75	0.00	0.43	0.24	0.24
P-88	J-86	J-85	16.75	0.01	0.00	0.43	0.24	0.24
P-89	J-41	J-88	98.00	27.12	0.00	2.50	6.31	6.31
P-90	J-001	J-90	0.00	0.00	0.00	0.00	0.00	0.00
P-011d	J-011c	J-011d	-25.59	0.34	0.00	0.65	0.52	0.52
P-065c	J-065a	J-065b	0.00	0.00	0.00	0.00	0.00	0.00

FOLLOWING ADDITIONAL PIPES ARE CLOSED :
 P-036 P-079b

P U M P / L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE	INLET HEAD	OUTLET HEAD	PUMP HEAD	EFFIC- ENCY	USEFUL POWER	INCREMENTL COST	TOTAL COST	#PUMPS PARALLEL	#PUMPS SERIES	NPSH
------	----------	------------	-------------	-----------	-------------	--------------	-----------------	------------	-----------------	---------------	------

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

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
J-41	Start/End:Pa	0.38(0.36)	603.27	530.00	73.27	31.75
J-85	Long&How.Dic	0.45(0.36)	707.08	525.00	182.08	78.90
J-86	Long:Flush	0.00(0.00)	707.09	525.00	182.09	78.91
J-88	End:Pace/Car	98.00(**)	576.15	530.00	46.15	20.00
J-90	End:Carneal/	0.00(0.00)	710.62	540.00	170.62	73.93
J-001	Start:Carnea	0.75(0.36)	710.62	560.00	150.62	65.27
J-008	KY115&Long	1.12(0.36)	709.84	580.00	129.84	56.27
J-011c	End:Pruitt L	0.00(0.00)	720.84	565.00	155.84	67.53
J-011d	KY109&Pruitt	0.60(0.36)	721.19	572.00	149.19	64.65
J-065a	Hoover:4x3	0.45(0.36)	836.52	575.00	261.52	113.32
J-065b	End:Hoover3"	0.00(0.00)	836.52	630.00	206.52	89.49

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

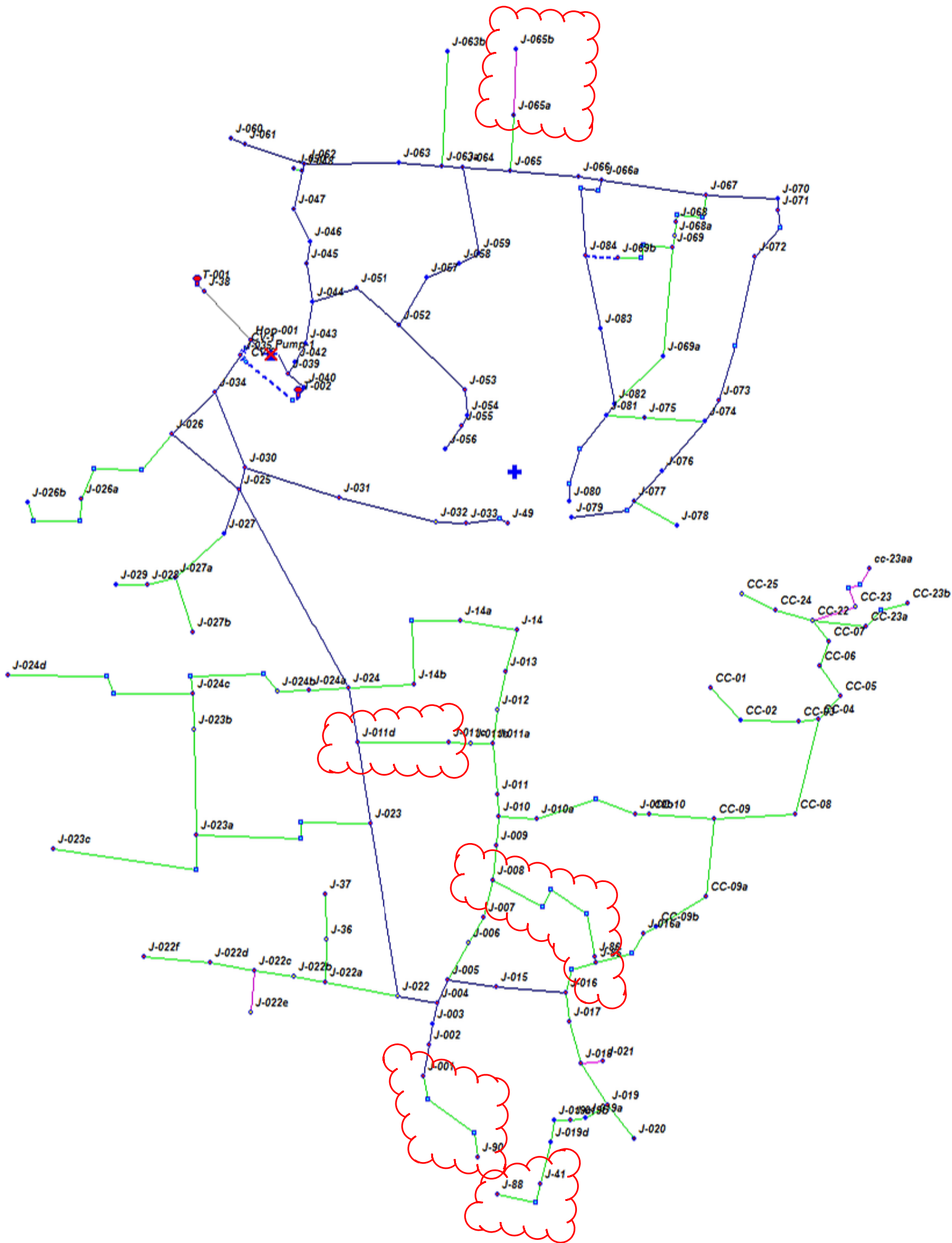
JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
J-047	132.98	J-88	20.00
J-061	124.28	J-41	31.75
J-064	120.31	J-019b	35.27
J-050	119.95	J-022e	44.22
J-063a	119.88	CC-25	44.77
J-051	119.61	J-019d	44.89
J-075	117.49	CC-23	46.94
J-065	116.79	J-022b	47.69
J-077	115.32	J-36	47.69
J-060	114.74	J-006	48.43

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
T-001	140.45	Hop. Ind. Pk
T-002	44.40	CCWD:CaskyST

NET SYSTEM INFLOW = 184.85
 NET SYSTEM OUTFLOW = 0.00
 NET SYSTEM DEMAND = 184.85



**Christian County Water District – Phase IX System Extension Project
“Princeton Road Tank Zone Area”**

**A. Daniel Road and Cerulean Springs Road Water Line Extensions
Hydraulic Comments**

Simulation 1

The affected area is modeled with the existing and proposed customers dispersed according to meter reading routes. The line extensions will be served by the District's Princeton Road elevated tank, which has an overflow of 807 and a capacity of 75,000 gallons. The tank is initially set at 802' (5' < overflow). Peak Demands are calculated as follows:

Approximate Number of Customers in the Pressure Zone: 396

Existing Peak Purchase Day Demand: *Not available*

Existing Average Day Demand (per CCWD usage data): 0.15 gpm/customer

Proposed Customers: 2 (A. Daniel) + 2 (Cerulean Springs) = 4

Existing Customers: $10 \times (\# \text{customers})^{.5} = 10(396)^{.5} = \sim .50 \text{ gpm/each}$

Proposed Customers: $10 \times (\# \text{customers})^{.5} = 10(4)^{.5} = \sim 5.0 \text{ gpm/ea}$

The model reflects the .50 gpm/meter throughout plus an additional 20.0 gpm along the proposed extensions. The model illustrates that adequate pressure is maintained throughout the majority of the system with a low water level in the tank.

Simulation 2 (A. Daniel Road Flushing)

This simulation depicts a flushing instance of the proposed four inch extension along A. Daniel Road with a demand of 98 gpm (2.5 ft/sec) placed at the hydrant location (J-16a). This flushing simulation is modeled using the normal operational use of the District's Princeton Road water tank. The 4" line is flushed with a full water tank and normal residential demands throughout. (Q=0.15 gpm/customer per CCWD info).

Simulation 3 (Cerulean Springs Road Flushing)

This simulation depicts a flushing instance of the proposed three inch extension along Cerulean Springs Road with a demand of 98 gpm (2.5 ft/sec) placed at the hydrant location (J-46b). This flushing simulation is modeled using the normal operational use of the District's Princeton Road water tank. The 3" line is flushed with a full water tank and normal residential demands throughout. (Q=0.15 gpm/customer per CCWD info).

An electronic version of the KYPIPE file is available upon request.

* * * * * K Y P I P E * * * * *
 *
 * Pipe Network Modeling Software *
 *
 * CopyRighted by KYPIPE LLC (www.kypipe.com) *
 * Version: 6.025 10/21/2013 *
 * Serial #: 8-5537150 *
 * Interface: Classic *
 * Licensed for Pipe2008 *
 *
 * * * * *

Date & Time: Fri Feb 10 14:41:10 2023

Master File : c:\aa_hydraulics & music\00hydraulics-kypipe\ccwd-red pressure zone\2023-02 phase ix extension project.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	N O D E N A M E S		L E N G T H (ft)	D I A M E T E R (in)	R O U G H N E S S C O E F F .	M I N O R L O S S C O E F F .
	#1	#2				
P-001	R-1	J-04	100.00	6.00	140.0000	0.00
P-002	I-Pump-1	J-04	100.00	6.00	140.0000	0.00
P-01	J-01	J-02	1800.00	6.00	140.0000	0.00
P-02	J-03	J-02	7000.00	6.00	140.0000	0.00
P-03	J-04	J-03	6500.00	6.00	140.0000	0.00
P-04-CV	J-04	J-05	3000.00	6.00	140.0000	0.00
P-05	J-05	J-23	8000.00	6.00	140.0000	0.00
P-06	J-06	O-Pump-1	4400.00	6.00	140.0000	0.00
P-07-CV	J-21a	J-06	4200.00	6.00	140.0000	0.00
P-07a	J-21	J-21a	800.00	6.00	140.0000	0.00
P-07b	J-21a	J-21b	1600.00	3.00	140.0000	0.00
P-07c	J-21b	J-21c	2400.00	3.00	140.0000	0.00
P-08	J-06	J-07	2400.00	6.00	140.0000	0.00
P-09	J-07	J-08	8500.00	4.00	140.0000	0.00
P-10	J-08	J-09	7000.00	4.00	140.0000	0.00
P-10a	J-09	J-09a	1350.00	3.00	140.0000	0.00
P-10b	J-09a	J-17	3650.00	3.00	140.0000	0.00
P-11	J-09	J-10	3500.00	4.00	140.0000	0.00
P-12	J-10	J-11	1300.00	4.00	140.0000	0.00
P-13	J-11	J-12	2800.00	4.00	140.0000	0.00
P-14	J-21a	J-13	2500.00	4.00	140.0000	0.00
P-15	J-13	J-14	3000.00	4.00	140.0000	0.00
P-16	J-12	J-15	800.00	4.00	140.0000	0.00
P-16a	J-15	J-15a	4750.00	4.00	140.0000	0.00
P-16b	J-15a	J-15b	350.00	4.00	140.0000	0.00
P-17	J-15	J-16	5000.00	4.00	140.0000	0.00
P-17a	J-16	J-16a	3250.00	4.00	140.0000	0.00
P-17b	J-16a	J-15c	50.00	4.00	140.0000	0.00
P-18	J-16	J-17	1800.00	4.00	140.0000	0.00
P-19	J-17	J-18	2200.00	4.00	140.0000	0.00
P-19a	J-18	J-18a	1500.00	4.00	140.0000	0.00
P-19b	J-18a	J-19	1500.00	4.00	140.0000	0.00

P-20	J-20	J-19	2200.00	2.00	140.0000	0.00
P-21	J-21	J-20	2000.00	6.00	140.0000	0.00
P-22	J-22	J-22a	1650.00	4.00	140.0000	0.00
P-22a	J-22a	J-21	4850.00	4.00	140.0000	0.00
P-22b	J-14	J-22a	1600.00	4.00	140.0000	0.00
P-23	J-23	J-22	3500.00	4.00	140.0000	0.00
P-24	J-24	J-23	4000.00	4.00	140.0000	0.00
P-25	J-25	J-24	7000.00	4.00	140.0000	0.00
P-26	J-26	J-25	8000.00	4.00	140.0000	0.00
P-27-XX	J-02	J-26	3500.00	4.00	140.0000	0.00
P-28	J-20	J-27a	4900.00	6.00	140.0000	0.00
P-28a	J-27a	J-27	500.00	6.00	140.0000	0.00
P-28b	J-27a	J-27b	7800.00	4.00	140.0000	0.00
P-28c	J-27b	J-27c	5400.00	4.00	140.0000	0.00
P-29	J-27	T-1	1600.00	6.00	140.0000	0.00
P-30	J-27	J-27d	3700.00	6.00	140.0000	0.00
P-30a	J-27d	J-28	2550.00	6.00	140.0000	0.00
P-30b	J-27d	J-15d	3685.00	4.00	140.0000	0.00
P-30c	J-15c	J-15b	1500.00	3.00	140.0000	0.00
P-30d	J-28	J-28a	3100.00	4.00	140.0000	0.00
P-30da	J-15d	J-15c	1500.00	3.00	140.0000	0.00
P-30e	J-28a	J-34	4700.00	4.00	140.0000	0.00
P-31	J-28	J-29	6500.00	6.00	140.0000	0.00
P-32	J-29	J-30	5000.00	4.00	140.0000	0.00
P-33	J-30	J-31	7000.00	4.00	140.0000	0.00
P-34	J-29	J-32	1100.00	6.00	140.0000	0.00
P-35	J-32	J-33	5000.00	3.00	140.0000	0.00
P-36	J-33	J-34	4000.00	3.00	140.0000	0.00
P-37	J-32	J-32a	3700.00	6.00	140.0000	0.00
P-37a	J-32a	J-35	2550.00	6.00	140.0000	0.00
P-37b	J-32a	J-32b	2650.00	4.00	140.0000	0.00
P-37c	J-32b	J-32c	1950.00	4.00	140.0000	0.00
P-37d	J-32c	J-32d	900.00	4.00	140.0000	0.00
P-38	J-35	J-36	1000.00	4.00	140.0000	0.00
P-39	J-36	J-37	2000.00	4.00	140.0000	0.00
P-40	J-37	J-38	6000.00	4.00	140.0000	0.00
P-41	J-36	J-39	2800.00	4.00	140.0000	0.00
P-42	J-39	J-40	3700.00	4.00	140.0000	0.00
P-42a	J-40	J-40a	2300.00	4.00	140.0000	0.00
P-42b	J-40a	J-40b	7900.00	4.00	140.0000	0.00
P-43	J-39	J-41	4500.00	4.00	140.0000	0.00
P-44	J-41	J-42	1800.00	4.00	140.0000	0.00
P-44a	J-42	J-42a	1700.00	4.00	140.0000	0.00
P-44b	J-42a	J-42b	2000.00	4.00	140.0000	0.00
P-45	J-42b	J-43	2500.00	4.00	140.0000	0.00
P-46	J-43	J-44	1500.00	4.00	140.0000	0.00
P-47	J-42a	J-45	2000.00	4.00	140.0000	0.00
P-48	J-45	J-46	3500.00	4.00	140.0000	0.00
P-49	J-46	J-47	4000.00	4.00	140.0000	0.00
P-50	J-47	J-48	1000.00	4.00	140.0000	0.00
P-51	J-48	J-49	2300.00	4.00	140.0000	0.00
P-52	J-49	J-50	2600.00	4.00	140.0000	0.00
P-52a	J-50	J-50a	3300.00	3.00	140.0000	0.00
P-53	J-50	J-51	1250.00	3.00	140.0000	0.00
P-54	J-46	J-46a	2600.00	3.00	140.0000	0.00
P-54a	J-46a	J-46b	8000.00	3.00	140.0000	0.00
P-55	J-51	J-52	1400.00	3.00	140.0000	0.00
P-56	J-52	J-53	6250.00	3.00	140.0000	0.00

P U M P / L O S S E L E M E N T D A T A

THERE IS A DEVICE AT NODE Pump-1 DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
225.00	0.00	75.00 (Default)
210.00	100.00	75.00 (Default)
180.00	150.00	75.00 (Default)
140.00	195.00	75.00 (Default)

N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
J-01	US68&1349	2.50	503.00	
J-02	KY1349&1663	7.75	519.00	
J-03	Pt on Quisen	7.50	555.00	
J-04	KY1349&Shurd	4.25	615.00	
J-05	Hi:ShurdanCh	3.75	655.00	
J-06	KY91&1349	16.00	525.00	
J-07	KY91&HarmGrv	12.25	506.00	
J-08	Hi:HarmonyGr	10.50	690.00	
J-09	Start:O.Dani	2.75	666.00	
J-09a	End:O.Daniel	0.50	625.00	
J-10	HarmGrvCemet	2.75	705.00	
J-11	End:HarmongG	2.75	705.00	
J-12	Start:Dudley	1.50	675.00	
J-13	Hi:Sheppard	1.75	600.00	
J-14	End:Sheppard	1.00	580.00	
J-15	ClarkSt-Sink	2.50	650.00	
J-15a	Hi:Rascoe	1.25	718.00	
J-15b	End:Rascoe	0.25	700.00	
J-15c	A.Daniel&Ras	0.50	630.00	
J-15d	4x3:A.Daniel	1.00	590.00	
J-16	Start: A.Dan	4.50	594.00	
J-16a	High:A.Danie	9.50	648.00	
J-17	O.Dan&ClarkS	3.25	557.00	
J-18	4"end:Clarks	1.25	635.00	
J-18a	ClarksStoreC	0.50	560.00	
J-19	2"end:Clarks	2.00	620.00	
J-20	KY91&ClarksS	9.75	587.00	
J-21	KY91&1026	4.00	554.00	
J-21a	Start:Sheppd	7.00	550.00	
J-21b	Lo:JC Kelly@	1.25	545.00	
J-21c	End:JC Kelly	0.50	560.00	
J-22	KY1026@curve	1.25	600.00	
J-22a	KY1026&Shep	2.25	600.00	
J-23	KY1026&Shurd	2.25	555.00	
J-24	KY1026 curve	0.50	566.00	
J-25	KY1026&1663	3.25	525.00	
J-26		2.75	544.00	
J-27	KY91&near ta	2.25	700.00	
J-27a	Start:Ceru-S	6.25	690.00	
J-27b	Hi:Cerul-Sin	1.00	700.00	
J-27c	End:Cerul-Si	0.50	545.00	
J-27d	KY91&A.Danie	5.00	607.00	
J-28	Start:KY624@	6.25	545.00	
J-28a	Hi:KY624	1.00	600.00	
J-29	KY91&Woosley	5.75	545.00	
J-30	Woosley@rive	1.75	490.00	
J-31	End:Woosley	1.00	700.00	
J-32	KY91&Quarry	5.00	575.00	
J-32a	Start:Dr.Hat	3.50	500.00	
J-32b	Creek:Dr.Hat	0.75	470.00	
J-32c	End1:Dr.Hatc	0.50	485.00	
J-32d	End2:Dr. Hat	0.25	490.00	
J-33	Quarry&Ky624	2.00	530.00	
J-34	End:KY624(4x	0.75	540.00	
J-35	6"end:KY91	1.25	480.00	
J-36	KY91&398	1.25	491.00	
J-37	Bainbridge	3.00	510.00	
J-38	End:KY398	2.50	640.00	
J-39	KY91&124	2.50	506.00	
J-40	Start:SugarC	0.75	470.00	
J-40a	Hi:Sugar Cre	1.25	520.00	
J-40b	End:SugarCre	1.00	510.00	
J-41	KY91@SugCrk	1.75	479.00	
J-42	Start/End:KY	0.50	495.00	

J-42a	91&Rat Roger	0.75	535.00	
J-42b	Hi:Rat Roger	0.25	575.00	
J-43	Low:Rat Roge	0.50	505.00	
J-44	End:Rat Roge	0.25	550.00	
J-45	Hi:KY 91	1.25	595.00	
J-46	91&WallacePa	1.00	489.00	
J-46a	Hi:Cerulean	0.50	550.00	
J-46b	End:Cerulean	9.50	510.00	
J-47	Hi:Wallace P	0.75	640.00	
J-48	Curve:Wal Pa	0.75	580.00	
J-49	Curve:Wal Pa	1.00	585.00	
J-50	WalPark&Cald	1.00	612.00	
J-50a	End:WalParkC	0.25	680.00	
J-51	Hi:Wallace P	0.75	672.00	
J-52	Creek:WallPa	1.00	570.00	
J-53	End:WallaceP	0.50	708.00	
O-Pump-1	Quisenb. Pum	0.00	615.00	
R-1	1349Tank(OF6	----	618.00	690.00
T-1	KY91GroundST	----	790.00	802.00
I-Pump-1	Quisenb. Pum	0.00	615.00	

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

OUTPUT SELECTION: THE FOLLOWING RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

ALL CLOSED PIPES ARE NOTED
ALL PIPES WITH PUMPS

FOLLOWING PIPES

P-17a
P-17b
P-54
P-54a

FOLLOWING JUNCTION NODES

J-15c
J-16
J-16a
J-46
J-46a
J-46b

MAXIMUM AND MINIMUM PRESSURES = 10

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

NUMBER OF PIPES(p) = 90
NUMBER OF END NODES(j) = 81
NUMBER OF PRIMARY LOOPS(l) = 8
NUMBER OF SUPPLY NODES(f) = 2
NUMBER OF SUPPLY ZONES(z) = 1

=====
Case: 0

RESULTS OBTAINED AFTER 11 TRIALS: ACCURACY = 0.00000

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)

Phase IX System Extension Project: The 3" & 4" line extensions will be served by the District's KY 91 (Princeton Road) ground-level tank, which has an overflow of 807 and a capacity of 75,000 gallons. Tank is initially set at 802' (5'<overflow). The model contains existing customers (396) disbursed by route records with demands equivalent to $10x(\#C)^{.5}$ (.50

gpm/customer) & 4 proposed customers with demands of 5.0 gpm/ea.

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS		FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
	#1	#2						
P-17a	J-16	J-16a	-8.61	0.23	0.00	0.22	0.07	0.07
P-17b	J-16a	J-15c	-18.11	0.01	0.00	0.46	0.28	0.28
P-54	J-46	J-46a	10.00	0.97	0.00	0.45	0.37	0.37
P-54a	J-46a	J-46b	9.50	2.72	0.00	0.43	0.34	0.34

FOLLOWING ADDITIONAL PIPES ARE CLOSED :
P-04 P-27

PUMP/LOSS ELEMENT RESULTS

NAME	FLOWRATE	INLET HEAD	OUTLET HEAD	PUMP HEAD	EFFIC-ENCY	USEFUL POWER	INCREMENTL COST	TOTAL COST	#PUMPS PARALLEL	#PUMPS SERIES	NPSH Avail.
	gpm	ft	ft	ft	%	Hp	\$	\$			ft

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

NODE RESULTS

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
J-15c	A.Daniel&Ras	0.50	789.14	630.00	159.14	68.96
J-16	Start: A.Dan	4.50	788.90	594.00	194.90	84.46
J-16a	High:A.Danie	9.50	789.12	648.00	141.12	61.15
J-46	91&WallacePa	1.00	783.07	489.00	294.07	127.43
J-46a	Hi: Cerulean	0.50	782.10	550.00	232.10	100.58
J-46b	End: Cerulean	9.50	779.38	510.00	269.38	116.73

MAXIMUM AND MINIMUM VALUES

PRESURES

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
J-32b	138.87	T-1	5.20
J-40	137.57	J-15a	30.74
J-35	134.39	R-1	31.20
J-41	132.90	J-53	32.40
J-32c	132.37	J-04	32.50
J-30	130.55	I-Pump-1	32.50

J-32d	130.20	J-10	36.31
J-36	129.23	J-11	36.31
J-46	127.43	J-15b	38.54
J-32a	125.87	J-31	39.54

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
R-1	22.00	1349Tank(OF6
T-1	196.00	KY91GroundST
NET SYSTEM INFLOW	= 218.00	
NET SYSTEM OUTFLOW	= 0.00	
NET SYSTEM DEMAND	= 218.00	

=====
 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)

A. Daniel Flushing Simulation: A 98 gpm demand is placed at the end of the new 4" water line (node J-16a). The tank is reset to the overflow, and the other demands are reset to normal conditions (District Avg = .15 gpm/cust).

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Pipe P-17b is CLOSED
 TANK at node T-1 has a new HGL of 807.000

RESULTS OBTAINED AFTER 4 TRIALS: ACCURACY = 0.00002

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 #1	NODE #2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/1000 ft/f	HL/1000 ft/f
P-17a	J-16	J-16a	98.00	20.50	0.00	2.50	6.31	6.31
P-17b-XX	J-16a	J-15c						
P-54	J-46	J-46a	0.15	0.00	0.00	0.01	0.00	0.00
P-54a	J-46a	J-46b	0.00	0.00	0.00	0.00	0.00	0.00

FOLLOWING ADDITIONAL PIPES ARE CLOSED :
 P-04 P-27

P U M P / L O S S E L E M E N T R E S U L T S

NAME Avail.	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft	EFFIC-ENCY %	USEFUL POWER Hp	INCREMENTL COST \$	TOTAL COST \$	#PUMPS PARALLEL	#PUMPS SERIES	NPSH ft
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FOLLOWING ADDITIONAL PIPES ARE CLOSED :

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

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
J-15c	A.Daniel&Ras	0.15(0.30)	789.81	630.00	159.81	69.25
J-16	Start: A.Dan	1.35(0.30)	765.10	594.00	171.10	74.14
J-16a	High:A.Danie	98.00(**)	744.60	648.00	96.60	41.86
J-46	91&WallacePa	0.30(0.30)	802.01	489.00	313.01	135.64
J-46a	Hi: Cerulean	0.15(0.30)	802.01	550.00	252.01	109.20
J-46b	End: Cerulean	0.00(0.00)	802.01	510.00	292.01	126.54

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-32b	144.00	T-1	7.37
J-40	143.93	J-15a	27.52
J-41	140.00	J-11	30.81
J-35	139.66	J-10	30.91
J-32c	137.50	R-1	31.20
J-46	135.64	J-04	32.50
J-30	135.36	I-Pump-1	32.50
J-32d	135.34	J-15b	35.51
J-36	134.87	J-53	40.72
J-42	133.06	J-08	41.40

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
R-1	6.60	1349Tank(OF6
T-1	151.10	KY91GroundST

NET SYSTEM INFLOW = 157.70
 NET SYSTEM OUTFLOW = 0.00
 NET SYSTEM DEMAND = 157.70

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)

Cerulean Springs Flushing: A 55 gpm demand is placed at the end of the new 3" water line (node J-46b). The tank is reset to the overflow, and the other demands are reset to normal conditions (District Avg = .15 gpm/cust).

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

Pipe P-17b is OPENED

RESULTS OBTAINED AFTER 8 TRIALS: ACCURACY = 0.00012

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE #1	NODE #2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/1000 ft/f	HL/1000 ft/f
P-17a	J-16	J-16a	1.15	0.01	0.00	0.03	0.00	0.00
P-17b	J-16a	J-15c	1.15	0.00	0.00	0.03	0.00	0.00
P-54	J-46	J-46a	55.15	22.95	0.00	2.50	8.83	8.83
P-54a	J-46a	J-46b	55.00	70.27	0.00	2.50	8.78	8.78

FOLLOWING ADDITIONAL PIPES ARE CLOSED :
P-04 P-27

PUMP/LOSS ELEMENT RESULTS

NAME Avail.	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft	EFFIC-ENCY %	USEFUL POWER Hp	INCREMENTL COST \$	TOTAL COST \$	#PUMPS PARALLEL	#PUMPS SERIES	NPSH ft
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FOLLOWING ADDITIONAL PIPES ARE CLOSED :

FOLLOWING ADDITIONAL PIPES ARE CLOSED :

NODE RESULTS

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
J-15c	A.Daniel&Ras	0.15(0.30)	803.51	630.00	173.51	75.19
J-16	Start: A.Dan	1.35(0.30)	803.51	594.00	209.51	90.79
J-16a	High:A.Danie	0.00(0.00)	803.51	648.00	155.51	67.39
J-46	91&WallacePa	0.30(0.30)	754.77	489.00	265.77	115.17
J-46a	Hi: Cerulean	0.15(0.30)	731.82	550.00	181.82	78.79
J-46b	End: Cerulean	55.00(5.79)	661.54	510.00	151.54	65.67

MAXIMUM AND MINIMUM VALUES

PRESSURES

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
J-32b	142.15	T-1	7.37
J-40	137.41	J-53	20.25
J-35	137.39	R-1	31.20
J-32c	135.65	J-50a	32.39

J-30	134.29	J-04	32.50
J-32d	133.49	I-Pump-1	32.50
J-36	131.44	J-51	35.86
J-07	129.26	J-15a	37.05
J-32a	129.15	J-11	42.69
J-41	128.73	J-10	42.70

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
R-1	6.60	1349Tank(OF6
T-1	108.10	KY91GroundST

NET SYSTEM INFLOW = 114.70
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 114.70

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

