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* * * * * K Y P I P E * * * * *
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* Pipe Network Modeling Software
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* CopyRighted by KYPIPE LLC (www.kypipe.com)
* Version: 10.009 10/01/2019
* Company: Bluegrass Serial #: 591388
* Interface: Classic
* Licensed for Pipe2022
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Date & Time: Wed Jun 14 10:59:26 2023

Master File : B:\PROJECTS\Western Mason Water District\21015 - Water System Improvement Project\Notes\Hydraulics\21015 wsi steady state.KYP\21015 wsi steady state.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

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

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

P I P E M I N O R N A M E C O E F F .	N O D E   N A M E S		L E N G T H ( f t )	D I A M E T E R ( i n )	R O U G H N E S S C O E F F .	L O S S
	#1	#2				
0.00	1	J-15	J-16	582.80	8.00	134.0000
0.00	2	J-15	J-12	886.00	4.00	134.0000
0.00	3	J-10	J-12	535.44	8.00	134.0000
0.00	4	J-10	J-11	301.06	6.00	128.0000

0.00	5	J-22	J-20	615.33	8.00	130.0000
0.00	6	J-22	J-23	1178.00	3.00	129.0000
0.00	7	J-2	J-3	760.00	2.00	125.0000
0.00	8	J-31	J-29	8683.19	3.00	128.0000
0.00	9	J-29	J-28	270.00	6.00	135.0000
0.00	10	I-Pump-1	J-102	6.90	8.00	133.0000
0.00	11	NWP-3	J-135	1052.38	3.00	128.0000
0.00	12	NWP-3	J-134	1950.00	2.00	128.0000
0.00	14	EGR-1	J-58	9780.00	4.00	130.0000
0.00	15	J-33	J-34	8378.27	6.00	130.0000
0.00	16	J-34	J-36	2500.16	3.00	128.0000
0.00	17	J-34	J-35	5127.00	4.00	130.0000
0.00	18	J-36	J-37	142.00	3.00	132.0000
0.00	19	J-36	J-38	94.14	3.00	132.0000
0.00	20	J-38	J-39	34.13	10.00	135.0000
0.00	21	J-42	J-43	3975.10	10.00	135.0000
0.00	22	J-43	J-45	241.35	6.00	135.0000
0.00	23	J-43	J-44	357.93	6.00	135.0000
0.00	24	J-39	J-42	59.56	10.00	135.0000
0.00	25	J-39	25	2751.51	10.00	135.0000
0.00	26	25	J-41	55.34	10.00	135.0000
0.00	27	25	J-40	4.85	6.00	135.0000
0.00	28	J-45	J-46	170.79	6.00	135.0000
0.00	29	J-45	J-32	3462.71	6.00	135.0000
0.00	30	J-52	NGR-3	206.10	6.00	128.0000
0.00	33	NGR-1	NGR-2	3034.20	3.00	130.0000
0.00	35	J-25	J-27	1257.44	8.00	130.0000

0.00	36	J-25	J-26	932.00	6.00	135.0000
0.00	37	J-65	NDG-1	977.76	8.00	130.0000
0.00	38	J-65	J-66	307.63	3.00	134.0000
0.00	39	J-68	J-70	642.62	3.00	134.0000
0.00	40	J-68	J-69	323.00	3.00	134.0000
0.00	41	J-66	J-68	135.00	3.00	134.0000
0.00	42	J-66	J-67	210.00	3.00	134.0000
0.00	44	NWP-2	J-132	770.00	3.00	130.0000
0.00	45	J-135	J-136	1986.57	3.00	128.0000
0.00	46	J-73	J-75	306.18	8.00	130.0000
0.00	47	J-73	J-74	2682.00	3.00	130.0000
0.00	48	NCG-1	J-112	614.52	3.00	130.0000
0.00	49	J-9	J-8	809.65	6.00	136.0000
0.00	50	EKY10-1	J-19	856.21	8.00	130.0000
0.00	51	30	J-108	849.39	8.00	133.0000
0.00	52	N10-1	J-65	1923.24	8.00	130.0000
0.00	53	79	78	85.94	8.00	116.0000
0.00	54	NDM-1	T-3	61.00	8.00	127.0000
0.00	55	J-64	J-71	1902.59	8.00	130.0000
0.00	56	NG-2	J-60	1790.77	4.00	135.0000
0.00	57	NG-2	J-28	528.99	4.00	135.0000
0.00	58	J-27	NG-1	405.94	6.00	136.0000
0.00	59	J-27	J-28	1880.87	8.00	130.0000
0.00	60	J-28	J-32	3239.33	8.00	130.0000
0.00	61	J-32	J-33	491.37	6.00	130.0000
0.00	62	J-32	T-4	178.53	6.00	130.0000
0.00	63	EKY10-1	T-5	217.91	8.00	130.0000

0.00	64	NGR-5	J-137	1277.83	6.00	128.0000
0.00	65-CV	N10-1	J-22	1474.70	8.00	130.0000
0.00	66	J-20	76	2434.95	2.00	128.0000
0.00	67	J-12	J-15	255.54	8.00	134.0000
0.00	68	J-12	J-13	2152.97	6.00	134.0000
0.00	69	J-7	J-10	510.65	8.00	134.0000
0.00	70	J-7	J-6	3901.28	6.00	134.0000
0.00	71	J-4	J-2	1966.45	3.00	128.0000
0.00	72	J-4	J-5	2967.94	3.00	126.0000
0.00	73	J-6	J-4	1633.96	6.00	134.0000
0.00	74	J-7	J-16	2007.49	4.00	134.0000
0.00	75	J-16	J-17	1114.75	8.00	134.0000
0.00	76	J-8	J-7	2951.13	8.00	134.0000
0.00	77	NDM-2	J-80	4552.00	4.00	130.0000
0.00	78	J-80	J-82	10641.00	4.00	125.0000
0.00	79	J-2	J-1	2146.56	3.00	128.0000
0.00	80	J-13	J-14	3681.55	6.00	134.0000
0.00	81	J-17	EKY10-1	4390.32	8.00	134.0000
0.00	83	J-19	J-20	6243.13	8.00	130.0000
0.00	84	76	J-21	3586.72	2.00	130.0000
0.00	85	J-71	J-72	1250.65	8.00	130.0000
0.00	86	J-75	J-76	504.80	8.00	130.0000
0.00	87	J-72	J-73	729.51	8.00	130.0000
0.00	88	J-76	J-77	4794.89	8.00	130.0000
0.00	89	J-77	24	2692.00	8.00	130.0000
0.00	90	J-60	J-61	1790.30	4.00	135.0000
0.00	91	J-61	J-62	1952.28	4.00	135.0000

0.00	92	J-62	J-63	705.65	4.00	135.0000
0.00	93	J-63	J-64	2270.63	4.00	135.0000
0.00	94	J-80	J-81	5826.00	3.00	130.0000
0.00	95	N10-2	J-25	309.68	8.00	130.0000
0.00	96	79	84	256.84	8.00	116.0000
0.00	97	NDG-1	J-64	1374.98	8.00	130.0000
0.00	98	N435-2	J-85	620.65	3.00	130.0000
0.00	99	J-86	J-87	2603.07	2.00	113.0000
0.00	100	J-86	J-88	2170.87	3.00	127.0000
0.00	101	J-88	J-89	5232.83	2.00	130.0000
0.00	102	J-88	J-90	8199.36	3.00	130.0000
0.00	103	T-3	83	40.00	8.00	127.0000
0.00	104	NDM-4	J-99	10.35	8.00	120.0000
0.00	105	O-Minerva	59	10.00	6.00	120.0000
0.00	106-XX	24	NDM-1	221.24	8.00	134.0000
0.00	107	59	24	75.00	8.00	134.0000
0.00	108	NDM-6	O-Pump-1	131.03	8.00	133.0000
0.00	109	J-102	DOVER TANK	48.19	6.00	123.0000
0.00	110	DOVER TANK	J-157	1626.63	8.00	133.0000
0.00	111	J-157	79	4393.76	8.00	116.0000
0.00	112	J-102	30	3245.60	8.00	133.0000
0.00	113	J-108	J-107	36.19	8.00	133.0000
0.00	114	J-107	J-108	9.03	6.00	130.0000
0.00	115	J-107	ND-1	428.63	6.00	130.0000
0.00	116	J-108	J-109	1675.70	6.00	130.0000
0.00	117	J-111	NCG-1	151.08	3.00	130.0000
0.00	118	J-111	J-113	1667.95	3.00	130.0000

0.00	119	J-104	30	918.22	6.00	108.0000
0.00	120	83I-Minerva		10.00	6.00	120.0000
0.00	134	J-109	ND-7	132.60	6.00	130.0000
0.00	135	J-109	J-110	9747.29	4.00	132.0000
0.00	136	J-104	ND-1	198.71	6.00	108.0000
0.00	137	J-104	J-105	5654.26	4.00	130.0000
0.00	141	NG-2	EGR-1	2588.03	6.00	135.0000
0.00	142	J-32	J-47	1411.39	6.00	127.0000
0.00	143	J-47	J-49	354.74	6.00	129.0000
0.00	144	J-47	J-48	657.71	6.00	127.0000
0.00	145	J-51	NGR-5	2723.11	6.00	128.0000
0.00	146	J-51	J-52	416.41	6.00	128.0000
0.00	147	J-49	J-50	834.53	6.00	129.0000
0.00	148	J-49	J-50	843.14	3.00	128.0000
0.00	149	J-50	J-51	402.11	6.00	129.0000
0.00	150	J-154	J-156	5063.77	6.00	128.0000
0.00	151	J-154	J-155	2752.89	3.00	128.0000
0.00	152	J-152	J-154	3638.80	6.00	128.0000
0.00	153	J-152	J-153	1293.60	3.00	131.0000
0.00	154	J-144	J-150	4024.21	6.00	128.0000
0.00	155	J-144	J-145	2051.15	4.00	131.0000
0.00	156	J-145	J-147	3599.26	4.00	132.0000
0.00	157	J-145	J-146	2417.89	4.00	131.0000
0.00	158	J-148	J-149	6461.94	4.00	132.0000
0.00	159	J-137	J-138	1090.27	6.00	128.0000
0.00	160	J-138	J-139	830.48	6.00	128.0000
0.00	161	J-139	J-140	1628.45	6.00	128.0000

0.00	162	J-140	J-141	2215.27	6.00	128.0000
0.00	163	J-141	J-142	979.72	6.00	128.0000
0.00	164	J-142	J-143	2111.90	6.00	128.0000
0.00	165	J-143	152	1325.83	6.00	128.0000
0.00	166	152	J-144	1546.64	6.00	128.0000
0.00	167	J-147	J-148	3701.15	4.00	132.0000
0.00	168	J-150	J-151	3355.83	6.00	128.0000
0.00	169	J-151	J-152	3116.77	6.00	128.0000
0.00	171	NDM-3	J-92	2702.24	4.00	130.0000
0.00	172	NSC-2	J-94	483.27	3.00	130.0000
0.00	174	J-92	NSC-1	1042.81	4.00	130.0000
0.00	175	J-92	J-96	1938.03	4.00	130.0000
0.00	182	ND-7	J-111	8396.93	6.00	130.0000
0.00	186	ND-20	ND-21	185.32	3.00	120.0000
0.00	188	ND-23	ED-1	671.92	2.00	128.0000
0.00	189	N435-1	J-86	339.37	3.00	127.0000
0.00	138.813ngr	NGR-1	NGR-2	138.80	6.00	120.0000
0.00	n10-1	N10-1	N10-2	3853.00	8.00	130.0000
0.00	n435-1	N435-2	N435-1	131.00	6.00	120.0000
0.00	n435-2	N435-3	N435-2	5994.07	6.00	120.0000
0.00	nad-1	NAD-2	NAD-1	243.70	4.00	120.0000
0.00	nad-2	NAD-2	NAD-3	351.00	3.00	120.0000
0.00	nad-3	NAD-2	NAD-4	14255.12	4.00	120.0000
0.00	nad-4	NDM-4	NAD-4	2000.00	6.00	120.0000
0.00	ncg-1	NCG-1	NCG-2	1040.00	3.00	140.0000
0.00	nd-1	ND-1	ND-2	557.61	6.00	120.0000
0.00	nd-2	ND-2	ND-3	271.55	6.00	120.0000

0.00	nd-3	ND-2	ND-4	842.82	3.00	120.0000
0.00	nd-4	ND-3	ND-4	598.07	3.00	120.0000
0.00	nd-5	ND-4	ND-5	267.90	3.00	120.0000
0.00	nd-6	ND-6	ND-5	315.96	3.00	120.0000
0.00	nd-7	ND-6	ND-7	2353.90	6.00	120.0000
0.00	nd-8	ND-8	ND-6	276.25	6.00	120.0000
0.00	nd-9	ND-8	ND-9	472.03	3.00	120.0000
0.00	nd-10	ND-9	ND-10	731.87	3.00	120.0000
0.00	nd-11	ND-10	ND-11	171.64	2.00	120.0000
0.00	nd-12	ND-12	ND-10	23.17	3.00	120.0000
0.00	nd-13	ND-13	ND-12	45.58	6.00	120.0000
0.00	nd-14	ND-8	ND-13	281.53	6.00	120.0000
0.00	nd-15	ND-12	ND-14	557.21	6.00	120.0000
0.00	nd-16	ND-15	ND-14	304.12	6.00	120.0000
0.00	nd-17	ND-15	ND-8	543.91	3.00	120.0000
0.00	nd-18	ND-3	ND-15	894.90	6.00	120.0000
0.00	nd-19	ND-14	ND-16	215.85	6.00	120.0000
0.00	nd-20	ND-16	ND-17	314.64	4.00	120.0000
0.00	nd-21	ND-17	ND-18	701.10	4.00	120.0000
0.00	nd-22	ND-18	ND-19	436.74	4.00	120.0000
0.00	nd-23	ND-18	ND-20	101.79	3.00	138.0000
0.00	nd-24	ND-17	ND-20	849.67	3.00	120.0000
0.00	nd-25	ND-21	ND-22	1100.00	2.00	120.0000
0.00	nd-26	ND-21	ND-23	1366.74	3.00	120.0000
0.00	nd-27	ND-14	ND-23	443.18	6.00	120.0000
0.00	ndg-1	NDG-1	NDG-2	1000.00	3.00	140.0000
0.00	ndm-1	NDM-1	NDM-2	2447.02	8.00	120.0000



0.00	ndm-2	NDM-2	N435-3	79.38	8.00	120.0000
0.00	ndm-3	N435-3	NDM-3	9390.17	8.00	120.0000
0.00	ndm-4	NDM-3	NDM-4	6989.81	8.00	120.0000
0.00	ndm-5	J-99	NDM-5	882.50	8.00	120.0000
0.00	ndm-6	NDM-5	NDM-6	889.85	8.00	120.0000
0.00	ng-1	NG-1	NG-2	1528.00	6.00	120.0000
0.00	ngr-1	EGR-1	NGR-1	778.02	6.00	120.0000
0.00	ngr-3	NGR-2	NGR-3	1189.02	6.00	120.0000
0.00	ngr-4	NGR-3	NGR-4	1959.80	6.00	120.0000
0.00	ngr-5	NGR-4	NGR-5	30.36	6.00	128.0000
0.00	nsc-1	NSC-1	NSC-2	643.23	4.00	120.0000
0.00	nsc-2	NSC-2	NSC-3	2583.77	4.00	120.0000
0.00	nwp-1	EKY10-1	NWP-1	2565.82	6.00	120.0000
0.00	nwp-2	NWP-1	NWP-2	6313.05	6.00	120.0000
0.00	nwp-3	NWP-2	NWP-3	1828.18	6.00	120.0000

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 Minerva Ex DESCRIBED BY THE FOLLOWING DATA:  
(ID= 2)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
132.00	0.00	75.00 (Default)
125.00	175.00	75.00 (Default)
110.00	246.00	75.00 (Default)
50.00	400.00	75.00 (Default)

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

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
311.00	0.00	75.00 (Default)
310.00	100.00	75.00 (Default)
272.00	250.00	75.00 (Default)

200.00	350.00	75.00 (Default)
150.00	400.00	75.00 (Default)

N O D E    D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
24		0.68	940.00	
25		0.00	921.00	
30		0.15	578.00	
59		0.00	940.00	
76		1.35	936.00	
78		0.00	532.00	
79		0.00	532.00	
83		0.00	940.00	
84		0.00	532.00	
152		0.22	930.00	
DOVER TANK		----	883.00	931.00
O-Minerva		0.00	0.00	
ED-1		0.15	508.00	
EGR-1		0.68	893.00	
EKY10-1		1.20	977.00	
J-1		1.20	940.00	
J-2		1.88	965.00	
J-3		0.38	957.00	
J-4		1.65	951.00	
J-5		0.97	947.00	
J-6		3.38	933.00	
J-7		7.43	970.00	
J-8		2.70	956.00	
J-9		2.15	950.00	
J-10		1.73	968.00	
J-11		0.08	969.00	
J-12		3.90	965.00	
J-13		3.83	965.00	
J-14		2.10	917.00	
J-15		2.33	965.00	
J-16		2.33	977.00	
J-17		1.05	960.00	
J-19		1.35	963.00	
J-20		1.95	946.00	
J-21		0.68	935.00	
J-22		1.35	958.00	
J-23		0.97	972.00	
J-25		0.08	931.00	
J-26		0.00	934.00	
J-27		0.00	930.00	
J-28		3.08	920.00	

J-29	2.47	921.00
J-31	2.47	870.00
J-32	0.52	948.00
J-33	0.68	966.00
J-34	1.88	923.00
J-35	0.90	916.00
J-36	0.30	950.00
J-37	0.00	950.00
J-38	0.00	948.00
J-39	0.00	948.00
J-40	0.00	923.00
J-41	0.00	922.00
J-42	0.82	947.00
J-43	0.97	896.00
J-44	0.15	890.00
J-45	0.08	895.00
J-46	0.08	910.00
J-47	0.97	960.00
J-48	0.45	940.00
J-49	0.68	945.00
J-50	0.97	939.00
J-51	1.65	953.00
J-52	0.75	952.00
J-58	0.38	800.00
J-60	1.12	940.00
J-61	0.52	850.00
J-62	0.30	930.00
J-63	0.45	890.00
J-64	0.97	962.00
J-65	0.60	963.00
J-66	0.00	956.00
J-67	0.00	945.00
J-68	0.15	954.00
J-69	0.00	954.00
J-70	0.15	939.00
J-71	0.60	912.00
J-72	0.38	943.00
J-73	0.45	939.00
J-74	0.30	945.00
J-75	0.15	910.00
J-76	0.52	944.00
J-77	1.12	937.00
J-80	1.58	812.00
J-81	0.45	895.00
J-82	0.75	920.00
J-85	0.22	935.00
J-86	1.42	925.00
J-87	0.90	923.00
J-88	2.85	930.00
J-89	0.60	909.00
J-90	1.73	877.00
J-92	0.68	915.00
J-94	0.08	898.00
J-96	0.60	914.00

J-99	0.30	914.00
J-102	0.00	880.00
J-104	0.30	545.00
J-105	0.15	540.00
J-107	0.15	553.00
J-108	0.00	553.00
J-109	0.00	536.00
J-110	0.00	555.00
J-111	1.50	513.00
J-112	0.38	510.00
J-113	0.38	505.00
J-132	0.08	932.00
J-134	0.30	932.00
J-135	0.30	920.00
J-136	0.15	925.00
J-137	0.45	865.00
J-138	0.08	920.00
J-139	0.15	880.00
J-140	0.15	912.00
J-141	0.08	940.00
J-142	0.08	928.00
J-143	0.22	890.00
J-144	0.60	872.00
J-145	0.60	926.00
J-146	0.30	850.00
J-147	0.22	900.00
J-148	0.30	910.00
J-149	0.15	533.00
J-150	0.90	915.00
J-151	1.12	900.00
J-152	1.73	900.00
J-153	0.45	900.00
J-154	1.50	900.00
J-155	0.22	895.00
J-156	0.52	870.00
J-157	0.00	835.00
N10-1	1.73	944.00
N10-2	1.12	950.00
N435-1	0.00	926.00
N435-2	2.03	926.00
N435-3	3.53	947.00
NAD-1	0.00	847.00
NAD-2	2.55	855.00
NAD-3	0.22	900.00
NAD-4	2.70	900.00
NCG-1	0.60	510.00
NCG-2	0.15	510.00
ND-1	0.60	553.00
ND-2	1.05	540.00
ND-3	4.95	539.00
ND-4	4.35	538.00
ND-5	0.38	532.00
ND-6	1.58	523.00
ND-7	2.17	536.00

ND-8		1.73	518.00	
ND-9		1.27	517.00	
ND-10		0.75	515.00	
ND-11		0.15	512.00	
ND-12		0.60	515.00	
ND-13		0.15	515.00	
ND-14		1.35	514.00	
ND-15		1.88	520.00	
ND-16		0.22	513.00	
ND-17		0.82	515.00	
ND-18		0.60	516.00	
ND-19		0.30	516.00	
ND-20		0.75	516.00	
ND-21		0.82	515.00	
ND-22		0.30	514.00	
ND-23		0.97	508.00	
NDG-1		0.52	960.00	
NDG-2		0.08	938.00	
NDM-1		1.65	940.00	
NDM-2		2.03	950.00	
NDM-3		2.92	919.00	
NDM-4		1.58	915.00	
NDM-5		0.45	876.00	
NDM-6		0.15	878.00	
NG-1		0.30	908.00	
NG-2		1.42	892.00	
NGR-1		2.17	922.00	
NGR-2		2.55	925.00	
NGR-3		1.80	940.00	
NGR-4		1.05	0.00	
NGR-5		1.35	0.00	
NSC-1		0.15	896.00	
NSC-2		0.45	901.00	
NSC-3		0.30	892.00	
NWP-1		0.68	957.00	
NWP-2		0.75	946.00	
NWP-3		0.68	943.00	
O-Pump-1		0.00	880.00	
T-3	Minerva Tank	----	940.00	1048.00
T-4	Highland Tan	----	960.00	1055.00
T-5	German Town	----	980.00	1100.00
I-Minerva		0.00	0.00	
I-Pump-1		0.00	880.00	

O U T P U T   O P T I O N   D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

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

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

NUMBER OF PIPES .....(P) = 208  
 NUMBER OF END NODES .....(J) = 186  
 NUMBER OF PRIMARY LOOPS .....(L) = 19  
 NUMBER OF SUPPLY NODES .....(F) = 4  
 NUMBER OF SUPPLY ZONES .....(Z) = 1

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 =====  
 Case: 0

RESULTS OBTAINED AFTER 13 TRIALS: ACCURACY = 0.50052E-04

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

P I P E L I N E   R E S U L T S

P I P E		N O D E   N U M B E R S		FLOWRATE	HEAD	MINOR	LINE
HL+ML/ N A M E	HL/ 1000   1000	#1	#2		LOSS	LOSS	VELO.
ft/f	ft/f			gpm	ft	ft	ft/s
0.03	0.03	J-15	J-16	-31.83	0.02	0.00	0.20
0.01	0.01	J-15	J-12	2.25	0.01	0.00	0.06
0.01	0.01	J-10	J-12	-19.68	0.01	0.00	0.13
0.00	0.00	J-10	J-11	0.08	0.00	0.00	0.00
0.00	0.00	J-22	J-20	-2.33	0.00	0.00	0.01
0.01	0.01	J-22	J-23	0.97	0.01	0.00	0.04
0.01	0.01	J-2	J-3	0.38	0.01	0.00	0.04
0.03	0.03	J-31	J-29	-2.47	0.29	0.00	0.11
0.00	0.00	J-29	J-28	-4.95	0.00	0.00	0.06

	10	I-Pump-1	J-102	-367.89	0.02	0.00	2.35
2.75	2.75						
	11	NWP-3	J-135	0.45	0.00	0.00	0.02
0.00	0.00						
	12	NWP-3	J-134	0.30	0.01	0.00	0.03
0.00	0.00						
	14	EGR-1	J-58	0.38	0.00	0.00	0.01
0.00	0.00						
	15	J-33	J-34	2.32	0.01	0.00	0.03
0.00	0.00						
	16	J-34	J-36	-0.45	0.00	0.00	0.02
0.00	0.00						
	17	J-34	J-35	0.90	0.01	0.00	0.02
0.00	0.00						
	18	J-36	J-37	0.00	0.00	0.00	0.00
0.00	0.00						
	19	J-36	J-38	-0.75	0.00	0.00	0.03
0.00	0.00						
	20	J-38	J-39	-0.75	0.00	0.00	0.00
0.00	0.00						
	21	J-42	J-43	-1.58	0.00	0.00	0.01
0.00	0.00						
	22	J-43	J-45	-2.70	0.00	0.00	0.03
0.00	0.00						
	23	J-43	J-44	0.15	0.00	0.00	0.00
0.00	0.00						
	24	J-39	J-42	-0.75	0.00	0.00	0.00
0.00	0.00						
	25	J-39	25	0.00	0.00	0.00	0.00
0.00	0.00						
	26	25	J-41	0.00	0.00	0.00	0.00
0.00	0.00						
	27	25	J-40	0.00	0.00	0.00	0.00
0.00	0.00						
	28	J-45	J-46	0.08	0.00	0.00	0.00
0.00	0.00						
	29	J-45	J-32	-2.85	0.00	0.00	0.03
0.00	0.00						
	30	J-52	NGR-3	-55.96	0.08	0.00	0.63
0.37	0.37						
	33	NGR-1	NGR-2	2.70	0.12	0.00	0.12
0.04	0.04						
	35	J-25	J-27	294.62	2.39	0.00	1.88
1.90	1.90						
	36	J-25	J-26	0.00	0.00	0.00	0.00
0.00	0.00						
	37	J-65	NDG-1	-298.45	1.90	0.00	1.90
1.95	1.95						
	38	J-65	J-66	0.30	0.00	0.00	0.01
0.00	0.00						
	39	J-68	J-70	0.15	0.00	0.00	0.01
0.00	0.00						
	40	J-68	J-69	0.00	0.00	0.00	0.00
0.00	0.00						

0.00	41	J-66	J-68	0.30	0.00	0.00	0.01
0.00	0.00						
0.00	42	J-66	J-67	0.00	0.00	0.00	0.00
0.00	0.00						
0.00	44	NWP-2	J-132	0.08	0.00	0.00	0.00
0.00	0.00						
0.00	45	J-135	J-136	0.15	0.00	0.00	0.01
0.00	0.00						
2.73	46	J-73	J-75	-358.19	0.84	0.00	2.29
0.00	2.73						
0.00	47	J-73	J-74	0.30	0.00	0.00	0.01
0.00	0.00						
0.00	48	NCG-1	J-112	0.38	0.00	0.00	0.02
0.00	0.00						
0.00	49	J-9	J-8	-2.15	0.00	0.00	0.02
0.00	0.00						
0.00	50	EKY10-1	J-19	7.65	0.00	0.00	0.05
0.00	0.00						
0.02	51	30	J-108	22.30	0.01	0.00	0.14
0.02	0.02						
1.94	52	N10-1	J-65	-297.55	3.72	0.00	1.90
0.00	1.94						
0.00	53	79	78	0.00	0.00	0.00	0.00
0.00	0.00						
2.52	54	NDM-1	T-3	335.04	0.15	0.00	2.14
2.52	2.52						
2.70	55	J-64	J-71	-356.47	5.14	0.00	2.28
2.70	2.70						
2.24	56	NG-2	J-60	-54.04	4.01	0.00	1.38
2.24	2.24						
1.34	57	NG-2	J-28	40.97	0.71	0.00	1.05
1.34	1.34						
0.58	58	J-27	NG-1	76.18	0.24	0.00	0.86
0.58	0.58						
1.09	59	J-27	J-28	218.44	2.05	0.00	1.39
1.09	1.09						
1.42	60	J-28	J-32	251.39	4.59	0.00	1.60
1.42	1.42						
0.00	61	J-32	J-33	3.00	0.00	0.00	0.03
0.00	0.00						
8.33	62	J-32	T-4	307.03	1.49	0.00	3.48
8.33	8.33						
0.07	63	EKY10-1	T-5	-50.82	0.02	0.00	0.32
0.07	0.07						
0.02	64	NGR-5	J-137	10.05	0.02	0.00	0.11
0.02	0.02						
0.17	65-XXCV	N10-1	J-22				
0.17	66	J-20	76	2.02	0.40	0.00	0.21
0.17	0.17						
0.02	67	J-12	J-15	-27.26	0.01	0.00	0.17
0.02	0.02						
0.01	68	J-12	J-13	5.93	0.01	0.00	0.07
0.01	0.01						



	69	J-7	J-10	-17.88	0.01	0.00	0.11
0.01	0.01						
	70	J-7	J-6	9.45	0.05	0.00	0.11
0.01	0.01						
	71	J-4	J-2	3.45	0.12	0.00	0.16
0.06	0.06						
	72	J-4	J-5	0.97	0.02	0.00	0.04
0.01	0.01						
	73	J-6	J-4	6.07	0.01	0.00	0.07
0.01	0.01						
	74	J-7	J-16	-3.84	0.03	0.00	0.10
0.02	0.02						
	75	J-16	J-17	-38.00	0.05	0.00	0.24
0.04	0.04						
	76	J-8	J-7	-4.85	0.00	0.00	0.03
0.00	0.00						
	77	NDM-2	J-80	2.78	0.04	0.00	0.07
0.01	0.01						
	78	J-80	J-82	0.75	0.01	0.00	0.02
0.00	0.00						
	79	J-2	J-1	1.20	0.02	0.00	0.05
0.01	0.01						
	80	J-13	J-14	2.10	0.00	0.00	0.02
0.00	0.00						
	81	J-17	EKY10-1	-39.05	0.19	0.00	0.25
0.04	0.04						
	83	J-19	J-20	6.30	0.01	0.00	0.04
0.00	0.00						
	84	76	J-21	0.68	0.08	0.00	0.07
0.02	0.02						
	85	J-71	J-72	-357.07	3.39	0.00	2.28
2.71	2.71						
	86	J-75	J-76	-358.34	1.38	0.00	2.29
2.73	2.73						
	87	J-72	J-73	-357.44	1.98	0.00	2.28
2.72	2.72						
	88	J-76	J-77	-358.87	13.13	0.00	2.29
2.74	2.74						
	89	J-77	24	-359.99	7.41	0.00	2.30
2.75	2.75						
	90	J-60	J-61	-55.17	4.17	0.00	1.41
2.33	2.33						
	91	J-61	J-62	-55.69	4.63	0.00	1.42
2.37	2.37						
	92	J-62	J-63	-55.99	1.69	0.00	1.43
2.39	2.39						
	93	J-63	J-64	-56.44	5.51	0.00	1.44
2.43	2.43						
	94	J-80	J-81	0.45	0.01	0.00	0.02
0.00	0.00						
	95	N10-2	J-25	294.70	0.59	0.00	1.88
1.90	1.90						
	96	79	84	0.00	0.00	0.00	0.00
0.00	0.00						

1.95	97	NDG-1	J-64	-299.05	2.69	0.00	1.91
0.00	98	N435-2	J-85	0.22	0.00	0.00	0.01
0.05	99	J-86	J-87	0.90	0.12	0.00	0.09
0.13	100	J-86	J-88	5.17	0.29	0.00	0.23
0.02	101	J-88	J-89	0.60	0.09	0.00	0.06
0.02	102	J-88	J-90	1.73	0.14	0.00	0.08
2.89	103	T-3	83	360.67	0.12	0.00	2.30
3.31	104	NDM-4	J-99	-366.99	0.03	0.00	2.34
13.01	105	O-Minerva	59	360.67	0.13	0.00	4.09
2.61	106-XX	24	NDM-1				
2.75	107	59	24	360.67	0.20	0.00	2.30
15.02	108	NDM-6	O-Pump-1	-367.89	0.36	0.00	2.35
0.00	109	J-102	DOVER TANK	-399.54	0.72	0.00	4.53
0.00	110	DOVER TANK	J-157	0.00	0.00	0.00	0.00
0.00	111	J-157	79	0.00	0.00	0.00	0.00
0.03	112	J-102	30	31.65	0.09	0.00	0.20
0.00	113	J-108	J-107	5.23	0.00	0.00	0.03
0.00	114	J-107	J-108	-5.07	0.00	0.00	0.06
0.02	115	J-107	ND-1	10.15	0.01	0.00	0.12
0.02	116	J-108	J-109	12.00	0.03	0.00	0.14
0.01	117	J-111	NCG-1	1.13	0.00	0.00	0.05
0.00	118	J-111	J-113	0.38	0.00	0.00	0.02
0.02	119	J-104	30	-9.20	0.02	0.00	0.10
13.01	120	83I-Minerva		360.67	0.13	0.00	4.09
0.02	134	J-109	ND-7	12.00	0.00	0.00	0.14
0.00	135	J-109	J-110	0.00	0.00	0.00	0.00
0.02	136	J-104	ND-1	8.75	0.00	0.00	0.10

0.00	137	J-104	J-105	0.15	0.00	0.00	0.00
0.00	0.00						
0.76	141	NG-2	EGR-1	87.53	1.97	0.00	0.99
0.76	0.76						
0.45	142	J-32	J-47	-62.03	0.63	0.00	0.70
0.45	0.45						
0.46	143	J-47	J-49	-63.45	0.16	0.00	0.72
0.46	0.46						
0.00	144	J-47	J-48	0.45	0.00	0.00	0.01
0.00	0.00						
0.02	145	J-51	NGR-5	-11.54	0.05	0.00	0.13
0.02	0.02						
0.36	146	J-51	J-52	-55.21	0.15	0.00	0.63
0.36	0.36						
0.35	147	J-49	J-50	-55.31	0.29	0.00	0.63
0.35	0.35						
0.35	148	J-49	J-50	-8.82	0.29	0.00	0.40
0.35	0.35						
0.48	149	J-50	J-51	-65.10	0.19	0.00	0.74
0.48	0.48						
0.00	150	J-154	J-156	0.52	0.00	0.00	0.01
0.00	0.00						
0.00	151	J-154	J-155	0.22	0.00	0.00	0.01
0.00	0.00						
0.00	152	J-152	J-154	2.25	0.00	0.00	0.03
0.00	0.00						
0.00	153	J-152	J-153	0.45	0.00	0.00	0.02
0.00	0.00						
0.01	154	J-144	J-150	6.45	0.03	0.00	0.07
0.01	0.01						
0.00	155	J-144	J-145	1.58	0.01	0.00	0.04
0.00	0.00						
0.00	156	J-145	J-147	0.68	0.00	0.00	0.02
0.00	0.00						
0.00	157	J-145	J-146	0.30	0.00	0.00	0.01
0.00	0.00						
0.00	158	J-148	J-149	0.15	0.00	0.00	0.00
0.00	0.00						
0.01	159	J-137	J-138	9.60	0.02	0.00	0.11
0.01	0.01						
0.01	160	J-138	J-139	9.53	0.01	0.00	0.11
0.01	0.01						
0.01	161	J-139	J-140	9.38	0.02	0.00	0.11
0.01	0.01						
0.01	162	J-140	J-141	9.23	0.03	0.00	0.10
0.01	0.01						
0.01	163	J-141	J-142	9.15	0.01	0.00	0.10
0.01	0.01						
0.01	164	J-142	J-143	9.07	0.03	0.00	0.10
0.01	0.01						
0.01	165	J-143	152	8.85	0.02	0.00	0.10
0.01	0.01						
0.01	166	152	J-144	8.63	0.02	0.00	0.10
0.01	0.01						

0.00	167	J-147	J-148	0.45	0.00	0.00	0.01
0.00	0.00						
0.01	168	J-150	J-151	5.55	0.02	0.00	0.06
0.01	0.01						
0.00	169	J-151	J-152	4.43	0.01	0.00	0.05
0.00	0.00						
0.01	171	NDM-3	J-92	2.25	0.02	0.00	0.06
0.01	0.01						
0.00	172	NSC-2	J-94	0.08	0.00	0.00	0.00
0.00	0.00						
0.00	174	J-92	NSC-1	0.98	0.00	0.00	0.02
0.00	0.00						
0.00	175	J-92	J-96	0.60	0.00	0.00	0.02
0.00	0.00						
0.00	182	ND-7	J-111	3.00	0.01	0.00	0.03
0.00	0.00						
0.00	186	ND-20	ND-21	0.33	0.00	0.00	0.02
0.00	0.00						
0.00	188	ND-23	ED-1	0.15	0.00	0.00	0.02
0.00	0.00						
0.26	189	N435-1	J-86	7.50	0.09	0.00	0.34
0.26	0.26						
138.813	ngr	NGR-1	NGR-2	81.60	0.12	0.00	0.93
0.83	0.83						
1.91	n10-1	N10-1	N10-2	295.82	7.38	0.00	1.89
1.91	1.91						
0.01	n435-1	N435-2	N435-1	7.50	0.00	0.00	0.09
0.01	0.01						
0.02	n435-2	N435-3	N435-2	9.75	0.10	0.00	0.11
0.02	0.02						
0.00	nad-1	NAD-2	NAD-1	0.00	0.00	0.00	0.00
0.00	0.00						
0.00	nad-2	NAD-2	NAD-3	0.22	0.00	0.00	0.01
0.00	0.00						
0.01	nad-3	NAD-2	NAD-4	-2.78	0.16	0.00	0.07
0.01	0.01						
0.01	nad-4	NDM-4	NAD-4	5.47	0.01	0.00	0.06
0.01	0.01						
0.00	ncg-1	NCG-1	NCG-2	0.15	0.00	0.00	0.01
0.00	0.00						
0.05	nd-1	ND-1	ND-2	18.30	0.03	0.00	0.21
0.05	0.05						
0.04	nd-2	ND-2	ND-3	15.16	0.01	0.00	0.17
0.04	0.04						
0.03	nd-3	ND-2	ND-4	2.09	0.02	0.00	0.09
0.03	0.03						
0.02	nd-4	ND-3	ND-4	1.85	0.01	0.00	0.08
0.02	0.02						
0.00	nd-5	ND-4	ND-5	-0.41	0.00	0.00	0.02
0.00	0.00						
0.00	nd-6	ND-6	ND-5	0.78	0.00	0.00	0.04
0.00	0.00						
0.01	nd-7	ND-6	ND-7	-6.82	0.02	0.00	0.08
0.01	0.01						

0.00	nd-8	ND-8	ND-6	-4.46	0.00	0.00	0.05
0.00	0.00						
0.00	nd-9	ND-8	ND-9	0.78	0.00	0.00	0.04
0.00	0.00						
0.00	nd-10	ND-9	ND-10	-0.49	0.00	0.00	0.02
0.00	0.00						
0.00	nd-11	ND-10	ND-11	0.15	0.00	0.00	0.02
0.00	0.00						
0.01	nd-12	ND-12	ND-10	1.39	0.00	0.00	0.06
0.01	0.01						
0.00	nd-13	ND-13	ND-12	2.40	0.00	0.00	0.03
0.00	0.00						
0.00	nd-14	ND-8	ND-13	2.55	0.00	0.00	0.03
0.00	0.00						
0.00	nd-15	ND-12	ND-14	0.41	0.00	0.00	0.00
0.00	0.00						
0.01	nd-16	ND-15	ND-14	5.89	0.00	0.00	0.07
0.01	0.01						
0.00	nd-17	ND-15	ND-8	0.60	0.00	0.00	0.03
0.00	0.00						
0.01	nd-18	ND-3	ND-15	8.36	0.01	0.00	0.09
0.01	0.01						
0.00	nd-19	ND-14	ND-16	3.03	0.00	0.00	0.03
0.00	0.00						
0.01	nd-20	ND-16	ND-17	2.81	0.00	0.00	0.07
0.01	0.01						
0.00	nd-21	ND-17	ND-18	1.38	0.00	0.00	0.04
0.00	0.00						
0.00	nd-22	ND-18	ND-19	0.30	0.00	0.00	0.01
0.00	0.00						
0.00	nd-23	ND-18	ND-20	0.48	0.00	0.00	0.02
0.00	0.00						
0.00	nd-24	ND-17	ND-20	0.60	0.00	0.00	0.03
0.00	0.00						
0.01	nd-25	ND-21	ND-22	0.30	0.01	0.00	0.03
0.01	0.01						
0.00	nd-26	ND-21	ND-23	-0.79	0.01	0.00	0.04
0.00	0.00						
0.00	nd-27	ND-14	ND-23	1.92	0.00	0.00	0.02
0.00	0.00						
0.00	ndg-1	NDG-1	NDG-2	0.08	0.00	0.00	0.00
0.00	0.00						
2.82	ndm-1	NDM-1	NDM-2	-336.69	6.90	0.00	2.15
2.82	2.82						
2.90	ndm-2	NDM-2	N435-3	-341.49	0.23	0.00	2.18
2.90	2.90						
3.11	ndm-3	N435-3	NDM-3	-354.76	29.19	0.00	2.26
3.11	3.11						
3.19	ndm-4	NDM-3	NDM-4	-359.94	22.32	0.00	2.30
3.19	3.19						
3.31	ndm-5	J-99	NDM-5	-367.29	2.93	0.00	2.34
3.31	3.31						
3.32	ndm-6	NDM-5	NDM-6	-367.74	2.96	0.00	2.35
3.32	3.32						

0.73	ng-1	NG-1	NG-2	75.88	1.11	0.00	0.86
0.92	ngr-1	EGR-1	NGR-1	86.48	0.72	0.00	0.98
0.83	ngr-3	NGR-2	NGR-3	81.75	0.99	0.00	0.93
0.09	ngr-4	NGR-3	NGR-4	23.99	0.17	0.00	0.27
0.07	ngr-5	NGR-4	NGR-5	22.94	0.00	0.00	0.26
0.00	nsc-1	NSC-1	NSC-2	0.82	0.00	0.00	0.02
0.00	nsc-2	NSC-2	NSC-3	0.30	0.00	0.00	0.01
0.00	nwp-1	EKY10-1	NWP-1	2.93	0.00	0.00	0.03
0.00	nwp-2	NWP-1	NWP-2	2.25	0.01	0.00	0.03
0.00	nwp-3	NWP-2	NWP-3	1.43	0.00	0.00	0.02

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

INCREM	TOTAL	#PUMPS	INLET #PUMPS	OUTLET NPSH	PUMP Case	EFFIC-	USEFUL	
COST	NAME	FLOWRATE	HEAD	HEAD	HEAD	ENCY	POWER	COST
	COST PARALLEL	SERIES	Avail.					
\$		gpm	ft	ft	ft	%	Hp	\$
0.3	Minerva Ex	360.67	1047.75	1115.39	67.6	75.00	6.	0.3
0.8	Pump-1	367.89	50.26	233.07	182.8	75.00	17.	0.8

N O D E   R E S U L T S

NODE	NODE	EXTERNAL	HYDRAULIC	NODE	PRESSURE
	NAME	TITLE	DEMAND	ELEVATION	HEAD
			gpm	ft	ft
75.86	24		0.68	1115.07	175.07

58.71	25	0.00	1056.48	921.00	135.48
152.61	30	0.15	930.18	578.00	352.18
75.95	59	0.00	1115.26	940.00	175.26
70.88	76	1.35	1099.57	936.00	163.57
172.90	78	0.00	931.00	532.00	399.00
172.90	79	0.00	931.00	532.00	399.00
46.75	83	0.00	1047.88	940.00	107.88
172.90	84	0.00	931.00	532.00	399.00
55.32	152	0.22	1057.67	930.00	127.67
DOVER TANK		----	931.00	883.00	48.00
20.80					
O-Minerva		0.00	1115.39		
ED-1		0.15	930.11	508.00	422.11
182.91					
EGR-1		0.68	1059.82	893.00	166.82
72.29					
EKY10-1		1.20	1099.98	977.00	122.98
53.29					
J-1		1.20	1099.52	940.00	159.52
69.13					
J-2		1.88	1099.54	965.00	134.54
58.30					
J-3		0.38	1099.53	957.00	142.53
61.76					
J-4		1.65	1099.66	951.00	148.66
64.42					
J-5		0.97	1099.64	947.00	152.64
66.14					
J-6		3.38	1099.67	933.00	166.67
72.22					
J-7		7.43	1099.72	970.00	129.72
56.21					
J-8		2.70	1099.72	956.00	143.72
62.28					
J-9		2.15	1099.71	950.00	149.71
64.88					
J-10		1.73	1099.72	968.00	131.72
57.08					
J-11		0.08	1099.72	969.00	130.72
56.65					
J-12		3.90	1099.73	965.00	134.73
58.38					
J-13		3.83	1099.72	965.00	134.72
58.38					

79.18	J-14	2.10	1099.72	917.00	182.72
58.39	J-15	2.33	1099.73	965.00	134.73
53.19	J-16	2.33	1099.75	977.00	122.75
60.58	J-17	1.05	1099.80	960.00	139.80
59.36	J-19	1.35	1099.98	963.00	136.98
66.72	J-20	1.95	1099.97	946.00	153.97
71.28	J-21	0.68	1099.50	935.00	164.50
61.52	J-22	1.35	1099.97	958.00	141.97
55.45	J-23	0.97	1099.97	972.00	127.97
58.29	J-25	0.08	1065.52	931.00	134.52
56.99	J-26	0.00	1065.52	934.00	131.52
57.69	J-27	0.00	1063.13	930.00	133.13
61.13	J-28	3.08	1061.07	920.00	141.07
60.70	J-29	2.47	1061.07	921.00	140.07
82.67	J-31	2.47	1060.78	870.00	190.78
47.01	J-32	0.52	1056.49	948.00	108.49
39.21	J-33	0.68	1056.49	966.00	90.49
57.84	J-34	1.88	1056.48	923.00	133.48
60.87	J-35	0.90	1056.47	916.00	140.47
46.14	J-36	0.30	1056.48	950.00	106.48
46.14	J-37	0.00	1056.48	950.00	106.48
47.01	J-38	0.00	1056.48	948.00	108.48
47.01	J-39	0.00	1056.48	948.00	108.48
57.84	J-40	0.00	1056.48	923.00	133.48
58.28	J-41	0.00	1056.48	922.00	134.48
47.44	J-42	0.82	1056.48	947.00	109.48
69.54	J-43	0.97	1056.48	896.00	160.48



72.14	J-44	0.15	1056.48	890.00	166.48
69.98	J-45	0.08	1056.48	895.00	161.48
63.48	J-46	0.08	1056.48	910.00	146.48
42.09	J-47	0.97	1057.12	960.00	97.12
50.75	J-48	0.45	1057.12	940.00	117.12
48.66	J-49	0.68	1057.28	945.00	112.28
51.38	J-50	0.97	1057.58	939.00	118.58
45.40	J-51	1.65	1057.77	953.00	104.77
45.90	J-52	0.75	1057.92	952.00	105.92
112.59	J-58	0.38	1059.82	800.00	259.82
54.51	J-60	1.12	1065.80	940.00	125.80
95.32	J-61	0.52	1069.96	850.00	219.96
62.66	J-62	0.30	1074.59	930.00	144.59
80.72	J-63	0.45	1076.28	890.00	186.28
51.91	J-64	0.97	1081.79	962.00	119.79
49.49	J-65	0.60	1077.20	963.00	114.20
52.52	J-66	0.00	1077.20	956.00	121.20
57.29	J-67	0.00	1077.20	945.00	132.20
53.39	J-68	0.15	1077.20	954.00	123.20
53.39	J-69	0.00	1077.20	954.00	123.20
59.89	J-70	0.15	1077.20	939.00	138.20
75.81	J-71	0.60	1086.94	912.00	174.94
63.84	J-72	0.38	1090.33	943.00	147.33
66.44	J-73	0.45	1092.31	939.00	153.31
63.83	J-74	0.30	1092.31	945.00	147.31
79.36	J-75	0.15	1093.15	910.00	183.15
65.23	J-76	0.52	1094.53	944.00	150.53

73.95	J-77	1.12	1107.65	937.00	170.65
105.31	J-80	1.58	1055.01	812.00	243.01
69.34	J-81	0.45	1055.01	895.00	160.01
58.50	J-82	0.75	1055.00	920.00	135.00
52.08	J-85	0.22	1055.19	935.00	120.19
56.38	J-86	1.42	1055.10	925.00	130.10
57.19	J-87	0.90	1054.98	923.00	131.98
54.09	J-88	2.85	1054.81	930.00	124.81
63.15	J-89	0.60	1054.73	909.00	145.73
76.99	J-90	1.73	1054.68	877.00	177.68
73.43	J-92	0.68	1084.46	915.00	169.46
80.80	J-94	0.08	1084.46	898.00	186.46
73.87	J-96	0.60	1084.46	914.00	170.46
83.56	J-99	0.30	1106.83	914.00	192.83
21.79	J-102	0.00	930.28	880.00	50.28
166.90	J-104	0.30	930.16	545.00	385.16
169.07	J-105	0.15	930.16	540.00	390.16
163.44	J-107	0.15	930.17	553.00	377.17
163.44	J-108	0.00	930.17	553.00	377.17
170.79	J-109	0.00	930.13	536.00	394.13
162.56	J-110	0.00	930.13	555.00	375.13
180.75	J-111	1.50	930.12	513.00	417.12
182.05	J-112	0.38	930.12	510.00	420.12
184.22	J-113	0.38	930.12	505.00	425.12
72.79	J-132	0.08	1099.97	932.00	167.97
72.78	J-134	0.30	1099.96	932.00	167.96
77.99	J-135	0.30	1099.97	920.00	179.97

75.82	J-136	0.15	1099.97	925.00	174.97
83.55	J-137	0.45	1057.80	865.00	192.80
59.71	J-138	0.08	1057.79	920.00	137.79
77.04	J-139	0.15	1057.78	880.00	177.78
63.16	J-140	0.15	1057.76	912.00	145.76
51.01	J-141	0.08	1057.73	940.00	117.73
56.21	J-142	0.08	1057.71	928.00	129.71
72.66	J-143	0.22	1057.69	890.00	167.69
80.45	J-144	0.60	1057.65	872.00	185.65
57.05	J-145	0.60	1057.65	926.00	131.65
89.98	J-146	0.30	1057.65	850.00	207.65
68.31	J-147	0.22	1057.64	900.00	157.64
63.98	J-148	0.30	1057.64	910.00	147.64
227.35	J-149	0.15	1057.64	533.00	524.64
61.80	J-150	0.90	1057.63	915.00	142.63
68.30	J-151	1.12	1057.61	900.00	157.61
68.29	J-152	1.73	1057.60	900.00	157.60
68.29	J-153	0.45	1057.60	900.00	157.60
68.29	J-154	1.50	1057.60	900.00	157.60
70.46	J-155	0.22	1057.59	895.00	162.59
81.29	J-156	0.52	1057.60	870.00	187.60
41.60	J-157	0.00	931.00	835.00	96.00
56.11	N10-1	1.73	1073.48	944.00	129.48
50.31	N10-2	1.12	1066.11	950.00	116.11
55.98	N435-1	0.00	1055.19	926.00	129.19
55.98	N435-2	2.03	1055.19	926.00	129.19
46.92	N435-3	3.53	1055.29	947.00	108.29

112.50	NAD-1	0.00	1106.62	847.00	259.62
109.04	NAD-2	2.55	1106.62	855.00	251.62
89.54	NAD-3	0.22	1106.62	900.00	206.62
89.61	NAD-4	2.70	1106.79	900.00	206.79
182.05	NCG-1	0.60	930.12	510.00	420.12
182.05	NCG-2	0.15	930.12	510.00	420.12
163.44	ND-1	0.60	930.16	553.00	377.16
169.06	ND-2	1.05	930.13	540.00	390.13
169.49	ND-3	4.95	930.12	539.00	391.12
169.91	ND-4	4.35	930.11	538.00	392.11
172.51	ND-5	0.38	930.11	532.00	398.11
176.41	ND-6	1.58	930.11	523.00	407.11
170.79	ND-7	2.17	930.13	536.00	394.13
178.58	ND-8	1.73	930.11	518.00	412.11
179.01	ND-9	1.27	930.11	517.00	413.11
179.88	ND-10	0.75	930.11	515.00	415.11
181.18	ND-11	0.15	930.11	512.00	418.11
179.88	ND-12	0.60	930.11	515.00	415.11
179.88	ND-13	0.15	930.11	515.00	415.11
180.31	ND-14	1.35	930.11	514.00	416.11
177.72	ND-15	1.88	930.11	520.00	410.11
180.75	ND-16	0.22	930.11	513.00	417.11
179.88	ND-17	0.82	930.11	515.00	415.11
179.44	ND-18	0.60	930.10	516.00	414.10
179.44	ND-19	0.30	930.10	516.00	414.10
179.44	ND-20	0.75	930.10	516.00	414.10
179.88	ND-21	0.82	930.10	515.00	415.10

180.31	ND-22		0.30	930.10	514.00	416.10
182.91	ND-23		0.97	930.11	508.00	422.11
51.61	NDG-1		0.52	1079.11	960.00	119.11
61.15	NDG-2		0.08	1079.11	938.00	141.11
46.87	NDM-1		1.65	1048.15	940.00	108.15
45.53	NDM-2		2.03	1055.06	950.00	105.06
71.71	NDM-3		2.92	1084.48	919.00	165.48
83.11	NDM-4		1.58	1106.80	915.00	191.80
101.29	NDM-5		0.45	1109.76	876.00	233.76
101.71	NDM-6		0.15	1112.71	878.00	234.71
67.12	NG-1		0.30	1062.89	908.00	154.89
73.57	NG-2		1.42	1061.78	892.00	169.78
59.41	NGR-1		2.17	1059.10	922.00	137.10
58.06	NGR-2		2.55	1058.98	925.00	133.98
51.13	NGR-3		1.80	1057.99	940.00	117.99
	NGR-4		1.05	1057.83		
	NGR-5		1.35	1057.82		
81.67	NSC-1		0.15	1084.46	896.00	188.46
79.50	NSC-2		0.45	1084.46	901.00	183.46
83.40	NSC-3		0.30	1084.46	892.00	192.46
61.96	NWP-1		0.68	1099.98	957.00	142.98
66.72	NWP-2		0.75	1099.97	946.00	153.97
68.02	NWP-3		0.68	1099.97	943.00	156.97
101.00	O-Pump-1		0.00	1113.07	880.00	233.07
46.80	T-3	Minerva Tank	----	1048.00	940.00	108.00
41.17	T-4	Highland Tan	----	1055.00	960.00	95.00
52.00	T-5	German Town	----	1100.00	980.00	120.00
	I-Minerva		0.00	1047.75		



ndm-6

3.32

24

0.00

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
DOVER TANK	399.54	
T-3	25.63	Minerva Tank
T-4	-307.03	Highland Tan
T-5	50.82	German Town

NET SYSTEM INFLOW = 475.99  
NET SYSTEM OUTFLOW = -307.03  
NET SYSTEM DEMAND = 168.95

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Case: 1

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

JUNCTION DEMANDS CHANGED - PLEASE SEE RESULTS TABLE

RESULTS OBTAINED AFTER 4 TRIALS: ACCURACY = 0.52538E-04

P I P E L I N E   R E S U L T S

STATUS CODE:		XX -CLOSED PIPE	CV -CHECK VALVE				
P I P E HL+ML/ N A M E 1000	HL/ 1000	#1	#2	FLOWRATE gpm	HEAD ft	MINOR LOSS ft	LINE VELO. ft/s
0.03	1 0.03	J-15	J-16	-31.83	0.02	0.00	0.20

0.01	2	J-15	J-12	2.25	0.01	0.00	0.06
0.01	0.01						
0.01	3	J-10	J-12	-19.68	0.01	0.00	0.13
0.01	0.01						
0.00	4	J-10	J-11	0.08	0.00	0.00	0.00
0.00	0.00						
0.00	5	J-22	J-20	-2.33	0.00	0.00	0.01
0.00	0.00						
0.01	6	J-22	J-23	0.97	0.01	0.00	0.04
0.01	0.01						
0.01	7	J-2	J-3	0.38	0.01	0.00	0.04
0.01	0.01						
0.03	8	J-31	J-29	-2.47	0.29	0.00	0.11
0.03	0.03						
0.00	9	J-29	J-28	-4.95	0.00	0.00	0.06
0.00	0.00						
2.75	10	I-Pump-1	J-102	-367.89	0.02	0.00	2.35
2.75	2.75						
0.00	11	NWP-3	J-135	0.45	0.00	0.00	0.02
0.00	0.00						
0.00	12	NWP-3	J-134	0.30	0.01	0.00	0.03
0.00	0.00						
0.00	14	EGR-1	J-58	0.38	0.00	0.00	0.01
0.00	0.00						
0.00	15	J-33	J-34	2.32	0.01	0.00	0.03
0.00	0.00						
0.00	16	J-34	J-36	-0.45	0.00	0.00	0.02
0.00	0.00						
0.00	17	J-34	J-35	0.90	0.01	0.00	0.02
0.00	0.00						
0.00	18	J-36	J-37	0.00	0.00	0.00	0.00
0.00	0.00						
0.00	19	J-36	J-38	-0.75	0.00	0.00	0.03
0.00	0.00						
0.00	20	J-38	J-39	-0.75	0.00	0.00	0.00
0.00	0.00						
0.00	21	J-42	J-43	-1.58	0.00	0.00	0.01
0.00	0.00						
0.00	22	J-43	J-45	-2.70	0.00	0.00	0.03
0.00	0.00						
0.00	23	J-43	J-44	0.15	0.00	0.00	0.00
0.00	0.00						
0.00	24	J-39	J-42	-0.75	0.00	0.00	0.00
0.00	0.00						
0.00	25	J-39	25	0.00	0.00	0.00	0.00
0.00	0.00						
0.00	26	25	J-41	0.00	0.00	0.00	0.00
0.00	0.00						
0.00	27	25	J-40	0.00	0.00	0.00	0.00
0.00	0.00						
0.00	28	J-45	J-46	0.08	0.00	0.00	0.00
0.00	0.00						
0.00	29	J-45	J-32	-2.85	0.00	0.00	0.03
0.00	0.00						



0.37	30	J-52	NGR-3	-55.96	0.08	0.00	0.63
0.37	0.37						
0.04	33	NGR-1	NGR-2	2.70	0.12	0.00	0.12
0.04	0.04						
1.90	35	J-25	J-27	294.62	2.39	0.00	1.88
1.90	1.90						
0.00	36	J-25	J-26	0.00	0.00	0.00	0.00
0.00	0.00						
1.95	37	J-65	NDG-1	-298.45	1.90	0.00	1.90
1.95	1.95						
0.00	38	J-65	J-66	0.30	0.00	0.00	0.01
0.00	0.00						
0.00	39	J-68	J-70	0.15	0.00	0.00	0.01
0.00	0.00						
0.00	40	J-68	J-69	0.00	0.00	0.00	0.00
0.00	0.00						
0.00	41	J-66	J-68	0.30	0.00	0.00	0.01
0.00	0.00						
0.00	42	J-66	J-67	0.00	0.00	0.00	0.00
0.00	0.00						
0.00	44	NWP-2	J-132	0.08	0.00	0.00	0.00
0.00	0.00						
0.00	45	J-135	J-136	0.15	0.00	0.00	0.01
0.00	0.00						
2.73	46	J-73	J-75	-358.19	0.84	0.00	2.29
2.73	2.73						
0.00	47	J-73	J-74	0.30	0.00	0.00	0.01
0.00	0.00						
0.00	48	NCG-1	J-112	0.38	0.00	0.00	0.02
0.00	0.00						
0.00	49	J-9	J-8	-2.15	0.00	0.00	0.02
0.00	0.00						
0.00	50	EKY10-1	J-19	7.65	0.00	0.00	0.05
0.00	0.00						
0.02	51	30	J-108	22.30	0.01	0.00	0.14
0.02	0.02						
1.94	52	N10-1	J-65	-297.55	3.72	0.00	1.90
1.94	1.94						
0.00	53	79	78	0.00	0.00	0.00	0.00
0.00	0.00						
2.52	54	NDM-1	T-3	335.04	0.15	0.00	2.14
2.52	2.52						
2.70	55	J-64	J-71	-356.47	5.14	0.00	2.28
2.70	2.70						
2.24	56	NG-2	J-60	-54.04	4.01	0.00	1.38
2.24	2.24						
1.34	57	NG-2	J-28	40.97	0.71	0.00	1.05
1.34	1.34						
0.58	58	J-27	NG-1	76.18	0.24	0.00	0.86
0.58	0.58						
1.09	59	J-27	J-28	218.44	2.05	0.00	1.39
1.09	1.09						
1.42	60	J-28	J-32	251.39	4.59	0.00	1.60
1.42	1.42						

0.00	61	J-32	J-33	3.00	0.00	0.00	0.03
0.00	0.00						
8.33	62	J-32	T-4	307.03	1.49	0.00	3.48
8.33	8.33						
1.63	63	EKY10-1	T-5	-271.15	0.36	0.00	1.73
1.63	1.63						
0.02	64	NGR-5	J-137	10.05	0.02	0.00	0.11
0.02	0.02						
	65-XXCV	N10-1	J-22				
	66	J-20	76	2.02	0.40	0.00	0.21
0.17	0.17						
0.02	67	J-12	J-15	-27.26	0.01	0.00	0.17
0.02	0.02						
0.01	68	J-12	J-13	5.93	0.01	0.00	0.07
0.01	0.01						
0.01	69	J-7	J-10	-17.88	0.01	0.00	0.11
0.01	0.01						
0.01	70	J-7	J-6	9.45	0.05	0.00	0.11
0.01	0.01						
0.06	71	J-4	J-2	3.45	0.12	0.00	0.16
0.06	0.06						
0.01	72	J-4	J-5	0.97	0.02	0.00	0.04
0.01	0.01						
0.01	73	J-6	J-4	6.07	0.01	0.00	0.07
0.01	0.01						
0.02	74	J-7	J-16	-3.84	0.03	0.00	0.10
0.02	0.02						
0.04	75	J-16	J-17	-38.00	0.05	0.00	0.24
0.04	0.04						
0.00	76	J-8	J-7	-4.85	0.00	0.00	0.03
0.00	0.00						
0.01	77	NDM-2	J-80	2.78	0.04	0.00	0.07
0.01	0.01						
0.00	78	J-80	J-82	0.75	0.01	0.00	0.02
0.00	0.00						
0.01	79	J-2	J-1	1.20	0.02	0.00	0.05
0.01	0.01						
0.00	80	J-13	J-14	2.10	0.00	0.00	0.02
0.00	0.00						
0.04	81	J-17	EKY10-1	-39.05	0.19	0.00	0.25
0.04	0.04						
0.00	83	J-19	J-20	6.30	0.01	0.00	0.04
0.00	0.00						
0.02	84	76	J-21	0.68	0.08	0.00	0.07
0.02	0.02						
2.71	85	J-71	J-72	-357.07	3.39	0.00	2.28
2.71	2.71						
2.73	86	J-75	J-76	-358.34	1.38	0.00	2.29
2.73	2.73						
2.72	87	J-72	J-73	-357.44	1.98	0.00	2.28
2.72	2.72						
2.74	88	J-76	J-77	-358.87	13.13	0.00	2.29
2.74	2.74						

	89	J-77	24	-359.99	7.41	0.00	2.30
2.75	2.75						
	90	J-60	J-61	-55.17	4.17	0.00	1.41
2.33	2.33						
	91	J-61	J-62	-55.69	4.63	0.00	1.42
2.37	2.37						
	92	J-62	J-63	-55.99	1.69	0.00	1.43
2.39	2.39						
	93	J-63	J-64	-56.44	5.51	0.00	1.44
2.43	2.43						
	94	J-80	J-81	0.45	0.01	0.00	0.02
0.00	0.00						
	95	N10-2	J-25	294.70	0.59	0.00	1.88
1.90	1.90						
	96	79	84	0.00	0.00	0.00	0.00
0.00	0.00						
	97	NDG-1	J-64	-299.05	2.69	0.00	1.91
1.95	1.95						
	98	N435-2	J-85	0.22	0.00	0.00	0.01
0.00	0.00						
	99	J-86	J-87	0.90	0.12	0.00	0.09
0.05	0.05						
	100	J-86	J-88	5.17	0.29	0.00	0.23
0.13	0.13						
	101	J-88	J-89	0.60	0.09	0.00	0.06
0.02	0.02						
	102	J-88	J-90	1.73	0.14	0.00	0.08
0.02	0.02						
	103	T-3	83	360.67	0.12	0.00	2.30
2.89	2.89						
	104	NDM-4	J-99	-366.99	0.03	0.00	2.34
3.31	3.31						
	105	O-Minerva	59	360.67	0.13	0.00	4.09
13.01	13.01						
	106-XX	24	NDM-1				
	107	59	24	360.67	0.20	0.00	2.30
2.61	2.61						
	108	NDM-6	O-Pump-1	-367.89	0.36	0.00	2.35
2.75	2.75						
	109	J-102DOVER TANK		-399.54	0.72	0.00	4.53
15.02	15.02						
	110	DOVER TANK	J-157	0.00	0.00	0.00	0.00
0.00	0.00						
	111	J-157	79	0.00	0.00	0.00	0.00
0.00	0.00						
	112	J-102	30	31.65	0.09	0.00	0.20
0.03	0.03						
	113	J-108	J-107	5.23	0.00	0.00	0.03
0.00	0.00						
	114	J-107	J-108	-5.07	0.00	0.00	0.06
0.00	0.00						
	115	J-107	ND-1	10.15	0.01	0.00	0.12
0.02	0.02						

	116	J-108	J-109	12.00	0.03	0.00	0.14
0.02	0.02						
	117	J-111	NCG-1	1.13	0.00	0.00	0.05
0.01	0.01						
	118	J-111	J-113	0.38	0.00	0.00	0.02
0.00	0.00						
	119	J-104	30	-9.20	0.02	0.00	0.10
0.02	0.02						
	120	83I-Minerva		360.67	0.13	0.00	4.09
13.01	13.01						
	134	J-109	ND-7	12.00	0.00	0.00	0.14
0.02	0.02						
	135	J-109	J-110	0.00	0.00	0.00	0.00
0.00	0.00						
	136	J-104	ND-1	8.75	0.00	0.00	0.10
0.02	0.02						
	137	J-104	J-105	0.15	0.00	0.00	0.00
0.00	0.00						
	141	NG-2	EGR-1	87.53	1.97	0.00	0.99
0.76	0.76						
	142	J-32	J-47	-62.03	0.63	0.00	0.70
0.45	0.45						
	143	J-47	J-49	-63.45	0.16	0.00	0.72
0.46	0.46						
	144	J-47	J-48	0.45	0.00	0.00	0.01
0.00	0.00						
	145	J-51	NGR-5	-11.54	0.05	0.00	0.13
0.02	0.02						
	146	J-51	J-52	-55.21	0.15	0.00	0.63
0.36	0.36						
	147	J-49	J-50	-55.31	0.29	0.00	0.63
0.35	0.35						
	148	J-49	J-50	-8.82	0.29	0.00	0.40
0.35	0.35						
	149	J-50	J-51	-65.10	0.19	0.00	0.74
0.48	0.48						
	150	J-154	J-156	0.52	0.00	0.00	0.01
0.00	0.00						
	151	J-154	J-155	0.22	0.00	0.00	0.01
0.00	0.00						
	152	J-152	J-154	2.25	0.00	0.00	0.03
0.00	0.00						
	153	J-152	J-153	0.45	0.00	0.00	0.02
0.00	0.00						
	154	J-144	J-150	6.45	0.03	0.00	0.07
0.01	0.01						
	155	J-144	J-145	1.58	0.01	0.00	0.04
0.00	0.00						
	156	J-145	J-147	0.68	0.00	0.00	0.02
0.00	0.00						
	157	J-145	J-146	0.30	0.00	0.00	0.01
0.00	0.00						
	158	J-148	J-149	0.15	0.00	0.00	0.00
0.00	0.00						

	159	J-137	J-138	9.60	0.02	0.00	0.11
0.01	0.01						
	160	J-138	J-139	9.53	0.01	0.00	0.11
0.01	0.01						
	161	J-139	J-140	9.38	0.02	0.00	0.11
0.01	0.01						
	162	J-140	J-141	9.23	0.03	0.00	0.10
0.01	0.01						
	163	J-141	J-142	9.15	0.01	0.00	0.10
0.01	0.01						
	164	J-142	J-143	9.07	0.03	0.00	0.10
0.01	0.01						
	165	J-143	152	8.85	0.02	0.00	0.10
0.01	0.01						
	166	152	J-144	8.63	0.02	0.00	0.10
0.01	0.01						
	167	J-147	J-148	0.45	0.00	0.00	0.01
0.00	0.00						
	168	J-150	J-151	5.55	0.02	0.00	0.06
0.01	0.01						
	169	J-151	J-152	4.43	0.01	0.00	0.05
0.00	0.00						
	171	NDM-3	J-92	2.25	0.02	0.00	0.06
0.01	0.01						
	172	NSC-2	J-94	0.08	0.00	0.00	0.00
0.00	0.00						
	174	J-92	NSC-1	0.98	0.00	0.00	0.02
0.00	0.00						
	175	J-92	J-96	0.60	0.00	0.00	0.02
0.00	0.00						
	182	ND-7	J-111	3.00	0.01	0.00	0.03
0.00	0.00						
	186	ND-20	ND-21	0.33	0.00	0.00	0.02
0.00	0.00						
	188	ND-23	ED-1	0.15	0.00	0.00	0.02
0.00	0.00						
	189	N435-1	J-86	7.50	0.09	0.00	0.34
0.26	0.26						
138.813ngr		NGR-1	NGR-2	81.60	0.12	0.00	0.93
0.83	0.83						
	n10-1	N10-1	N10-2	295.82	7.38	0.00	1.89
1.91	1.91						
	n435-1	N435-2	N435-1	7.50	0.00	0.00	0.09
0.01	0.01						
	n435-2	N435-3	N435-2	9.75	0.10	0.00	0.11
0.02	0.02						
	nad-1	NAD-2	NAD-1	0.00	0.00	0.00	0.00
0.00	0.00						
	nad-2	NAD-2	NAD-3	0.22	0.00	0.00	0.01
0.00	0.00						
	nad-3	NAD-2	NAD-4	-2.78	0.16	0.00	0.07
0.01	0.01						
	nad-4	NDM-4	NAD-4	5.47	0.01	0.00	0.06
0.01	0.01						

0.00	ncg-1	NCG-1	NCG-2	0.15	0.00	0.00	0.01
0.00	0.00						
0.05	nd-1	ND-1	ND-2	18.30	0.03	0.00	0.21
0.05	0.05						
0.04	nd-2	ND-2	ND-3	15.16	0.01	0.00	0.17
0.04	0.04						
0.03	nd-3	ND-2	ND-4	2.09	0.02	0.00	0.09
0.03	0.03						
0.02	nd-4	ND-3	ND-4	1.85	0.01	0.00	0.08
0.02	0.02						
0.00	nd-5	ND-4	ND-5	-0.41	0.00	0.00	0.02
0.00	0.00						
0.00	nd-6	ND-6	ND-5	0.78	0.00	0.00	0.04
0.00	0.00						
0.01	nd-7	ND-6	ND-7	-6.82	0.02	0.00	0.08
0.01	0.01						
0.00	nd-8	ND-8	ND-6	-4.46	0.00	0.00	0.05
0.00	0.00						
0.00	nd-9	ND-8	ND-9	0.78	0.00	0.00	0.04
0.00	0.00						
0.00	nd-10	ND-9	ND-10	-0.49	0.00	0.00	0.02
0.00	0.00						
0.00	nd-11	ND-10	ND-11	0.15	0.00	0.00	0.02
0.00	0.00						
0.01	nd-12	ND-12	ND-10	1.39	0.00	0.00	0.06
0.01	0.01						
0.00	nd-13	ND-13	ND-12	2.40	0.00	0.00	0.03
0.00	0.00						
0.00	nd-14	ND-8	ND-13	2.55	0.00	0.00	0.03
0.00	0.00						
0.00	nd-15	ND-12	ND-14	0.41	0.00	0.00	0.00
0.00	0.00						
0.01	nd-16	ND-15	ND-14	5.89	0.00	0.00	0.07
0.01	0.01						
0.00	nd-17	ND-15	ND-8	0.60	0.00	0.00	0.03
0.00	0.00						
0.01	nd-18	ND-3	ND-15	8.36	0.01	0.00	0.09
0.01	0.01						
0.00	nd-19	ND-14	ND-16	3.03	0.00	0.00	0.03
0.00	0.00						
0.01	nd-20	ND-16	ND-17	2.81	0.00	0.00	0.07
0.01	0.01						
0.00	nd-21	ND-17	ND-18	1.38	0.00	0.00	0.04
0.00	0.00						
0.00	nd-22	ND-18	ND-19	0.30	0.00	0.00	0.01
0.00	0.00						
0.00	nd-23	ND-18	ND-20	0.48	0.00	0.00	0.02
0.00	0.00						
0.00	nd-24	ND-17	ND-20	0.60	0.00	0.00	0.03
0.00	0.00						
0.01	nd-25	ND-21	ND-22	0.30	0.01	0.00	0.03
0.01	0.01						
0.00	nd-26	ND-21	ND-23	-0.79	0.01	0.00	0.04
0.00	0.00						

0.00	nd-27	ND-14	ND-23	1.92	0.00	0.00	0.02
0.00	0.00						
0.00	ndg-1	NDG-1	NDG-2	0.08	0.00	0.00	0.00
0.00	0.00						
2.82	ndm-1	NDM-1	NDM-2	-336.69	6.90	0.00	2.15
2.82	2.82						
2.90	ndm-2	NDM-2	N435-3	-341.49	0.23	0.00	2.18
2.90	2.90						
3.11	ndm-3	N435-3	NDM-3	-354.76	29.19	0.00	2.26
3.11	3.11						
3.19	ndm-4	NDM-3	NDM-4	-359.94	22.32	0.00	2.30
3.19	3.19						
3.31	ndm-5	J-99	NDM-5	-367.29	2.93	0.00	2.34
3.31	3.31						
3.32	ndm-6	NDM-5	NDM-6	-367.74	2.96	0.00	2.35
3.32	3.32						
0.73	ng-1	NG-1	NG-2	75.88	1.11	0.00	0.86
0.73	0.73						
0.92	ngr-1	EGR-1	NGR-1	86.48	0.72	0.00	0.98
0.92	0.92						
0.83	ngr-3	NGR-2	NGR-3	81.75	0.99	0.00	0.93
0.83	0.83						
0.09	ngr-4	NGR-3	NGR-4	23.99	0.17	0.00	0.27
0.09	0.09						
0.07	ngr-5	NGR-4	NGR-5	22.94	0.00	0.00	0.26
0.07	0.07						
0.00	nsc-1	NSC-1	NSC-2	0.82	0.00	0.00	0.02
0.00	0.00						
0.00	nsc-2	NSC-2	NSC-3	0.30	0.00	0.00	0.01
0.00	0.00						
5.35	nwp-1	EKY10-1	NWP-1	223.25	13.73	0.00	2.53
5.35	5.35						
5.32	nwp-2	NWP-1	NWP-2	222.58	33.60	0.00	2.53
5.32	5.32						
5.29	nwp-3	NWP-2	NWP-3	221.75	9.66	0.00	2.52
5.29	5.29						

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

INCREM	TOTAL	#PUMPS	INLET #PUMPS	OUTLET NPSH	PUMP Case	EFFIC-	USEFUL		
COST	NAME	FLOWRATE	HEAD	HEAD	HEAD	ENCY	POWER	COST	
\$	COST PARALLEL	gpm	ft	ft	ft	%	Hp	\$	
0.6	Minerva Ex	360.67	1047.75	1115.39	67.6	75.00	6.	0.3	
0.6	**	**	1080.7	1.0000					

Pump-1      367.89      50.26      233.07      182.8      75.00      17.      0.8  
 1.7      \*\*      \*\*      83.4      1.0000

N O D E   R E S U L T S

NODE	NODE	EXTERNAL	HYDRAULIC	NODE	PRESSURE
NAME	TITLE	DEMAND	GRADE	ELEVATION	HEAD
PRESSURE		gpm	ft	ft	ft

75.86	24	0.68	1115.07	940.00	175.07
58.71	25	0.00	1056.48	921.00	135.48
152.61	30	0.15	930.18	578.00	352.18
75.95	59	0.00	1115.26	940.00	175.26
70.73	76	1.35	1099.23	936.00	163.23
172.90	78	0.00	931.00	532.00	399.00
172.90	79	0.00	931.00	532.00	399.00
46.75	83	0.00	1047.88	940.00	107.88
172.90	84	0.00	931.00	532.00	399.00
55.32	152	0.22	1057.67	930.00	127.67
20.80	DOVER TANK	----	931.00	883.00	48.00
182.91	O-Minerva	0.00	1115.39		
72.29	ED-1	0.15	930.11	508.00	422.11
53.15	EGR-1	0.68	1059.82	893.00	166.82
68.98	EKY10-1	1.20	1099.65	977.00	122.65
58.15	J-1	1.20	1099.18	940.00	159.18
61.62	J-2	1.88	1099.20	965.00	134.20
64.27	J-3	0.38	1099.19	957.00	142.19
66.00	J-4	1.65	1099.32	951.00	148.32
	J-5	0.97	1099.30	947.00	152.30



72.08	J-6	3.38	1099.33	933.00	166.33
56.06	J-7	7.43	1099.38	970.00	129.38
62.13	J-8	2.70	1099.38	956.00	143.38
64.73	J-9	2.15	1099.38	950.00	149.38
56.93	J-10	1.73	1099.38	968.00	131.38
56.50	J-11	0.08	1099.38	969.00	130.38
58.24	J-12	3.90	1099.39	965.00	134.39
58.23	J-13	3.83	1099.38	965.00	134.38
79.03	J-14	2.10	1099.38	917.00	182.38
58.24	J-15	2.33	1099.40	965.00	134.40
53.05	J-16	2.33	1099.41	977.00	122.41
60.43	J-17	1.05	1099.46	960.00	139.46
59.21	J-19	1.35	1099.64	963.00	136.64
66.57	J-20	1.95	1099.63	946.00	153.63
71.13	J-21	0.68	1099.16	935.00	164.16
61.37	J-22	1.35	1099.63	958.00	141.63
55.30	J-23	0.97	1099.63	972.00	127.63
58.29	J-25	0.08	1065.52	931.00	134.52
56.99	J-26	0.00	1065.52	934.00	131.52
57.69	J-27	0.00	1063.13	930.00	133.13
61.13	J-28	3.08	1061.07	920.00	141.07
60.70	J-29	2.47	1061.07	921.00	140.07
82.67	J-31	2.47	1060.78	870.00	190.78
47.01	J-32	0.52	1056.49	948.00	108.49
39.21	J-33	0.68	1056.49	966.00	90.49
57.84	J-34	1.88	1056.48	923.00	133.48
60.87	J-35	0.90	1056.47	916.00	140.47

46.14	J-36	0.30	1056.48	950.00	106.48
46.14	J-37	0.00	1056.48	950.00	106.48
47.01	J-38	0.00	1056.48	948.00	108.48
47.01	J-39	0.00	1056.48	948.00	108.48
57.84	J-40	0.00	1056.48	923.00	133.48
58.28	J-41	0.00	1056.48	922.00	134.48
47.44	J-42	0.82	1056.48	947.00	109.48
69.54	J-43	0.97	1056.48	896.00	160.48
72.14	J-44	0.15	1056.48	890.00	166.48
69.98	J-45	0.08	1056.48	895.00	161.48
63.48	J-46	0.08	1056.48	910.00	146.48
42.09	J-47	0.97	1057.12	960.00	97.12
50.75	J-48	0.45	1057.12	940.00	117.12
48.66	J-49	0.68	1057.28	945.00	112.28
51.38	J-50	0.97	1057.58	939.00	118.58
45.40	J-51	1.65	1057.77	953.00	104.77
45.90	J-52	0.75	1057.92	952.00	105.92
112.59	J-58	0.38	1059.82	800.00	259.82
54.51	J-60	1.12	1065.80	940.00	125.80
95.32	J-61	0.52	1069.96	850.00	219.96
62.66	J-62	0.30	1074.59	930.00	144.59
80.72	J-63	0.45	1076.28	890.00	186.28
51.91	J-64	0.97	1081.79	962.00	119.79
49.49	J-65	0.60	1077.20	963.00	114.20
52.52	J-66	0.00	1077.20	956.00	121.20
57.29	J-67	0.00	1077.20	945.00	132.20
53.39	J-68	0.15	1077.20	954.00	123.20

53.39	J-69	0.00	1077.20	954.00	123.20
59.89	J-70	0.15	1077.20	939.00	138.20
75.81	J-71	0.60	1086.94	912.00	174.94
63.84	J-72	0.38	1090.33	943.00	147.33
66.44	J-73	0.45	1092.31	939.00	153.31
63.83	J-74	0.30	1092.31	945.00	147.31
79.36	J-75	0.15	1093.15	910.00	183.15
65.23	J-76	0.52	1094.53	944.00	150.53
73.95	J-77	1.12	1107.65	937.00	170.65
105.31	J-80	1.58	1055.01	812.00	243.01
69.34	J-81	0.45	1055.01	895.00	160.01
58.50	J-82	0.75	1055.00	920.00	135.00
52.08	J-85	0.22	1055.19	935.00	120.19
56.38	J-86	1.42	1055.10	925.00	130.10
57.19	J-87	0.90	1054.98	923.00	131.98
54.09	J-88	2.85	1054.81	930.00	124.81
63.15	J-89	0.60	1054.73	909.00	145.73
76.99	J-90	1.73	1054.68	877.00	177.68
73.43	J-92	0.68	1084.46	915.00	169.46
80.80	J-94	0.08	1084.46	898.00	186.46
73.87	J-96	0.60	1084.46	914.00	170.46
83.56	J-99	0.30	1106.83	914.00	192.83
21.79	J-102	0.00	930.28	880.00	50.28
166.90	J-104	0.30	930.16	545.00	385.16
169.07	J-105	0.15	930.16	540.00	390.16
163.44	J-107	0.15	930.17	553.00	377.17
163.44	J-108	0.00	930.17	553.00	377.17

J-109	0.00	930.13	536.00	394.13
170.79				
J-110	0.00	930.13	555.00	375.13
162.56				
J-111	1.50	930.12	513.00	417.12
180.75				
J-112	0.38	930.12	510.00	420.12
182.05				
J-113	0.38	930.12	505.00	425.12
184.22				
J-132	0.08	1052.32	932.00	120.32
52.14				
J-134	0.30	1042.65	932.00	110.65
47.95				
J-135	0.30	1042.65	920.00	122.65
53.15				
J-136	0.15	1042.65	925.00	117.65
50.98				
J-137	0.45	1057.80	865.00	192.80
83.55				
J-138	0.08	1057.79	920.00	137.79
59.71				
J-139	0.15	1057.78	880.00	177.78
77.04				
J-140	0.15	1057.76	912.00	145.76
63.16				
J-141	0.08	1057.73	940.00	117.73
51.01				
J-142	0.08	1057.71	928.00	129.71
56.21				
J-143	0.22	1057.69	890.00	167.69
72.66				
J-144	0.60	1057.65	872.00	185.65
80.45				
J-145	0.60	1057.65	926.00	131.65
57.05				
J-146	0.30	1057.65	850.00	207.65
89.98				
J-147	0.22	1057.64	900.00	157.64
68.31				
J-148	0.30	1057.64	910.00	147.64
63.98				
J-149	0.15	1057.64	533.00	524.64
227.35				
J-150	0.90	1057.63	915.00	142.63
61.80				
J-151	1.12	1057.61	900.00	157.61
68.30				
J-152	1.73	1057.60	900.00	157.60
68.29				
J-153	0.45	1057.60	900.00	157.60
68.29				
J-154	1.50	1057.60	900.00	157.60
68.29				

70.46	J-155	0.22	1057.59	895.00	162.59
81.29	J-156	0.52	1057.60	870.00	187.60
41.60	J-157	0.00	931.00	835.00	96.00
56.11	N10-1	1.73	1073.48	944.00	129.48
50.31	N10-2	1.12	1066.11	950.00	116.11
55.98	N435-1	0.00	1055.19	926.00	129.19
55.98	N435-2	2.03	1055.19	926.00	129.19
46.92	N435-3	3.53	1055.29	947.00	108.29
112.50	NAD-1	0.00	1106.62	847.00	259.62
109.04	NAD-2	2.55	1106.62	855.00	251.62
89.54	NAD-3	0.22	1106.62	900.00	206.62
89.61	NAD-4	2.70	1106.79	900.00	206.79
182.05	NCG-1	0.60	930.12	510.00	420.12
182.05	NCG-2	0.15	930.12	510.00	420.12
163.44	ND-1	0.60	930.16	553.00	377.16
169.06	ND-2	1.05	930.13	540.00	390.13
169.49	ND-3	4.95	930.12	539.00	391.12
169.91	ND-4	4.35	930.11	538.00	392.11
172.51	ND-5	0.38	930.11	532.00	398.11
176.41	ND-6	1.58	930.11	523.00	407.11
170.79	ND-7	2.17	930.13	536.00	394.13
178.58	ND-8	1.73	930.11	518.00	412.11
179.01	ND-9	1.27	930.11	517.00	413.11
179.88	ND-10	0.75	930.11	515.00	415.11
181.18	ND-11	0.15	930.11	512.00	418.11
179.88	ND-12	0.60	930.11	515.00	415.11
179.88	ND-13	0.15	930.11	515.00	415.11

180.31	ND-14	1.35	930.11	514.00	416.11
177.72	ND-15	1.88	930.11	520.00	410.11
180.75	ND-16	0.22	930.11	513.00	417.11
179.88	ND-17	0.82	930.11	515.00	415.11
179.44	ND-18	0.60	930.10	516.00	414.10
179.44	ND-19	0.30	930.10	516.00	414.10
179.44	ND-20	0.75	930.10	516.00	414.10
179.88	ND-21	0.82	930.10	515.00	415.10
180.31	ND-22	0.30	930.10	514.00	416.10
182.91	ND-23	0.97	930.11	508.00	422.11
51.61	NDG-1	0.52	1079.11	960.00	119.11
61.15	NDG-2	0.08	1079.11	938.00	141.11
46.87	NDM-1	1.65	1048.15	940.00	108.15
45.53	NDM-2	2.03	1055.06	950.00	105.06
71.71	NDM-3	2.92	1084.48	919.00	165.48
83.11	NDM-4	1.58	1106.80	915.00	191.80
101.29	NDM-5	0.45	1109.76	876.00	233.76
101.71	NDM-6	0.15	1112.71	878.00	234.71
67.12	NG-1	0.30	1062.89	908.00	154.89
73.57	NG-2	1.42	1061.78	892.00	169.78
59.41	NGR-1	2.17	1059.10	922.00	137.10
58.06	NGR-2	2.55	1058.98	925.00	133.98
51.13	NGR-3	1.80	1057.99	940.00	117.99
	NGR-4	1.05	1057.83		
	NGR-5	1.35	1057.82		
81.67	NSC-1	0.15	1084.46	896.00	188.46
79.50	NSC-2	0.45	1084.46	901.00	183.46
83.40	NSC-3	0.30	1084.46	892.00	192.46

55.86	NWP-1		0.68	1085.91	957.00	128.91
46.07	NWP-2		0.75	1052.32	946.00	106.32
43.18	NWP-3		221.00( ** )	1042.66	943.00	99.66
101.00	O-Pump-1		0.00	1113.07	880.00	233.07
46.80	T-3	Minerva Tank	----	1048.00	940.00	108.00
41.17	T-4	Highland Tan	----	1055.00	960.00	95.00
52.00	T-5	German Town	----	1100.00	980.00	120.00
	I-Minerva		0.00	1047.75		
21.78	I-Pump-1		0.00	930.26	880.00	50.26

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-149	227.35	DOVER TANK	20.80
J-113	184.22	I-Pump-1	21.78
ND-23	182.91	J-102	21.79
ED-1	182.91	J-33	39.21
NCG-1	182.05	T-4	41.17

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
109	4.53	4	0.00
105	4.09	28	0.00
120	4.09	23	0.00
62	3.48	20	0.00
nwp-1	2.53	24	0.00

H L + M L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
109	15.02	28	0.00

105	13.01	4	0.00
120	13.01	23	0.00
62	8.33	20	0.00
nwp-1	5.35	24	0.00

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
109	15.02	28	0.00
105	13.01	4	0.00
120	13.01	23	0.00
62	8.33	20	0.00
nwp-1	5.35	24	0.00

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
DOVER TANK	399.54	
T-3	25.63	Minerva Tank
T-4	-307.03	Highland Tan
T-5	271.15	German Town

NET SYSTEM INFLOW = 696.32  
 NET SYSTEM OUTFLOW = -307.03  
 NET SYSTEM DEMAND = 389.27

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Total Power Cost

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TOTAL POWER COST(\$ ) FOR THIS SIMULATION = 2.30

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