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MINISTRY OF HOUSING AND URBAN DEVELOPMENT

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

THE STUDY ON GREATER KANDY AND NUWARA ELIYA WATER SUPPLY AND ENVIRONMENTAL IMPROVEMENT PLAN IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

VOLUME V

NUWARA ELIYA (SUPPORTING REPORT AND DATA)

FEBRUARY 1999

NIPPON JOGESUIDO SEKKEI CO., LTD.

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APPENDIX 5.1 Alternative Water Sources in Nuwara Eliya

1. Alternative Water Sources

Three sources have been identified that could potentially be developed to provide additional water for Nuwara Eliya.

- A stream near Jayalanka
- The existing Bambarakele source
- Groundwater

Although only very limited of flow measurement data are available for the surface water sources, sufficient information on rainfall, rainfall-runoff coefficients and evaporation rates are available for nearby catchment areas to allow an approximate estimate of yield from the proposed sources to be made. It is important to note that such an approximation is not as reliable as an analysis based on actual stream flow data and is not considered to be an adequate basis for design and construction of an impoundment facility.

Development of each of the surface water sources will require construction of impoundment, treatment, pumping and transmission facilities. Figure 1 illustrates the general arrangement of these facilities for the Jayalanka and Bambarakele sources. The locations of the proposed Bambarakele and Jayalanka dam sites are shown in Figure 2 and Figure 3, respectively. The Bambarakele and Jayalanka catchment areas are delineated in Figure 4 and Figure 5, respectively.

Three potential sites for construction of wells have been identified in the study area. The locations of these sites and the alignment of the transmission mains from the wells to service reservoirs in the Nuwara Eliya distribution system are shown in Figure 1.

A summary of the characteristics of the two potential surface water impoundments is presented in Table 1.

Table 1 **Characteristics of Potential Surface Water Impoundments in Nuwara Eliya**

Item	Jayalanka	Bambarakele
Surface Area (ha)	20.0	6.2
Catchment Area (ha)	568	220
Storage volume (m^3)	2,100,000	550,000
Usable Storage volume (m^3)	1,575,000	412,500
Dam Length (m)	270	220
Water Elevation (msl)		
Low water	1,920	1,940
High Water	1,940	1,960
Approximate Yield (m^3/d)	5,950	4,200

As can be seen from inspection of Table 2, the surface water source with the largest potential yield is at Jayalanka. A serious problem with this source is the presence of extensive vegetable plots in the catchment area where heavy use of fertilizers and agrochemicals to control pests pose a pollution threat. A considerable portion of the catchment area is used for growing tea, and it is estimated that up to 2,000 tea estate workers are housed there.

Acquisition of land used for vegetable cultivation is expected to cost about Rs.5,000,000 per hectare. Land costs for the area to be flooded by the impoundment, the dam site itself and a reasonable safety zone around the reservoir could cost in the neighborhood of Rs.150,000,000. A suitable level of protection against pollution would require as a minimum provision of adequate sanitation facilities for the resident catchment area population. Depending upon the extent of pollution by agrochemical compounds, it may be necessary to provide some form of advanced treatment or purchase and retire additional agricultural land. Some of the resident population may have to be resettled, with the attendant financial and social costs that are associated with any resettlement activity.

Although the yield from the Bambarakele source is estimated at 4,200 m^3/d (see discussion above), a portion of this yield is already being used and cannot be counted as a new source. The lowest flow measurement available for Bambarakele, from an admittedly very limited amount of flow data, is 1,650 m^3/d, which occurred in 1997. It is unlikely that this figure represents the low flow for a twenty year period of record that is commonly accepted as being required to establish a safe yield for a municipal water supply system. In the ten years of rainfall record currently available for the area, total rainfall during the dry months were up to 17 percent lower than the 1997 figure on two occasions. This suggests that the safe yield of the Bambarakele source without an impoundment is less than 1,650 m^3/d, possibly as low as 1,400 m^3/d. Given the above, it would appear that augmentation of the Bambarakele source by construction of an impoundment reservoir could increase the safe yield available to the community by about 2,800 m^3/d.

The Bambarakele source has some bacterial contamination due to human activities in the catchment area. Plans are under way to deal with this problem by installing pressure filters on the delivery main. Although filtration should be adequate for a stream source, additional treatment will be required after an impoundment reservoir has been built. Open storage reservoirs tend to accumulate nutrients from the catchment area and are subject to algae growth problems that will cause excessive clogging of filters. A conventional treatment facility, with sedimentation, coagulation and filtration, would be required for this source.

Hydrogeologic data in the Nuwara Eliya area is somewhat limited at the present time and it is difficult to accurately estimate the total yield that can be expected from groundwater. It is, however, the consensus among hydrogeologists working in the area that extraction of enough water to meet all of Nuwara Eliya's future needs (approximately 6,450 m^3/d) is unlikely. Electrical resistivity surveys and test well drilling are being carried out under the current investigation that should allow a better estimate of local groundwater potential to be made.

Production from existing wells in the area varies from less than 100 m^3/d to 600 m^3/d. For the purposes of this investigation, individual well production has been assumed to be 300 m^3/d. For the purposes of comparing groundwater to alternative sources of water for Nuwara Eliya, it has been assumed that 900 m^3/d can be obtained from this source.

2. Alternative Water Source Costs

Estimated costs associated with development of the three alternative water sources are presented in Table 2. Pipelines were amortized over 30 years, treatment facilities over 20 years, and pump stations and wells over 15 years, at 12 percent interest. Pipeline O & M costs were estimated at one percent of capital cost and pump station and well O & M were estimated at 5 percent of capital cost. Treatment plant O & M costs were derived from a 1997 Degremont report on a facility of similar capacity. Power costs were calculated based on a power rate of Rs. 5.0 /kWh. Unit costs were based on the service population in 2015.

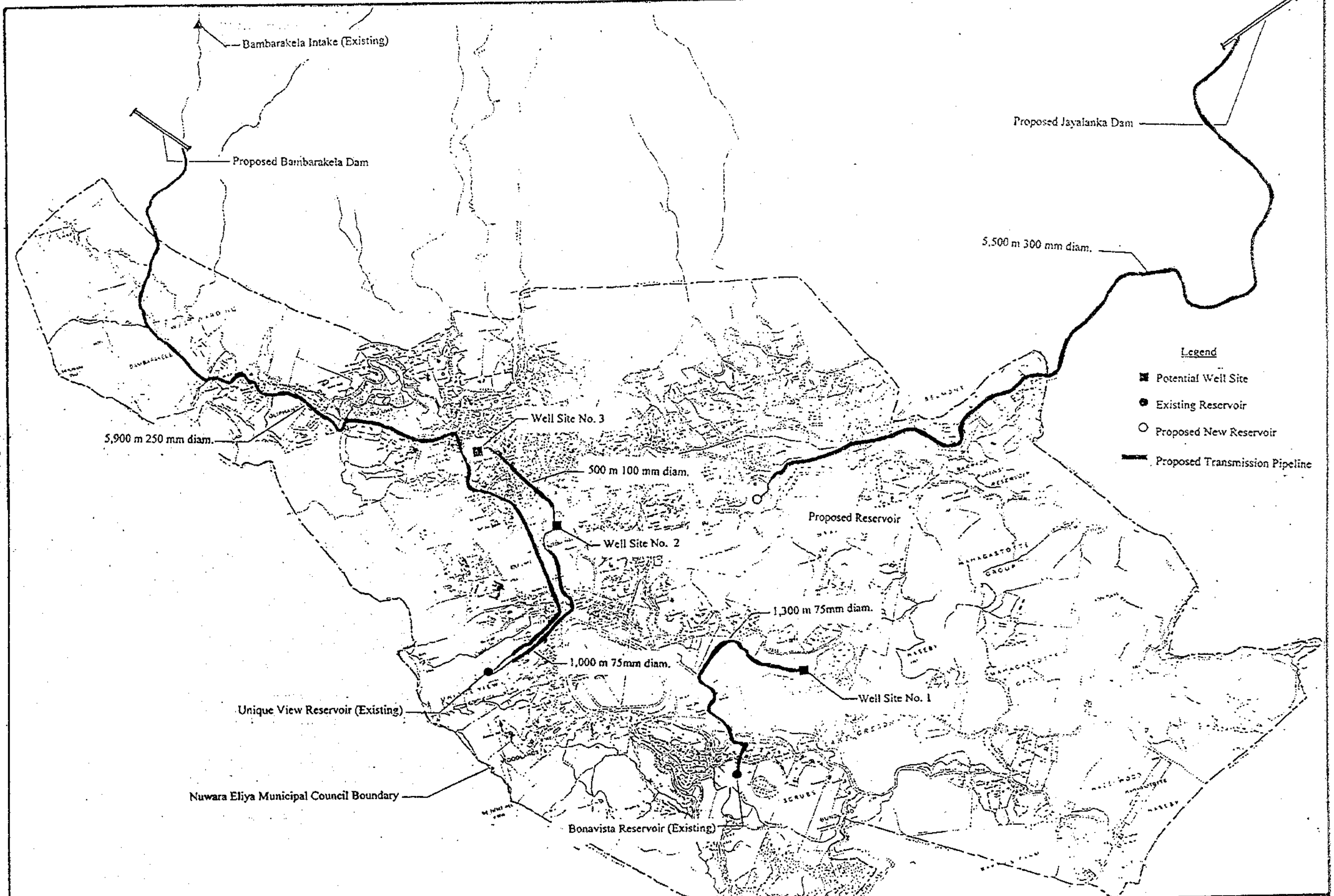


Figure 1 Location of Potential Water Sources for Nuwara Eliya

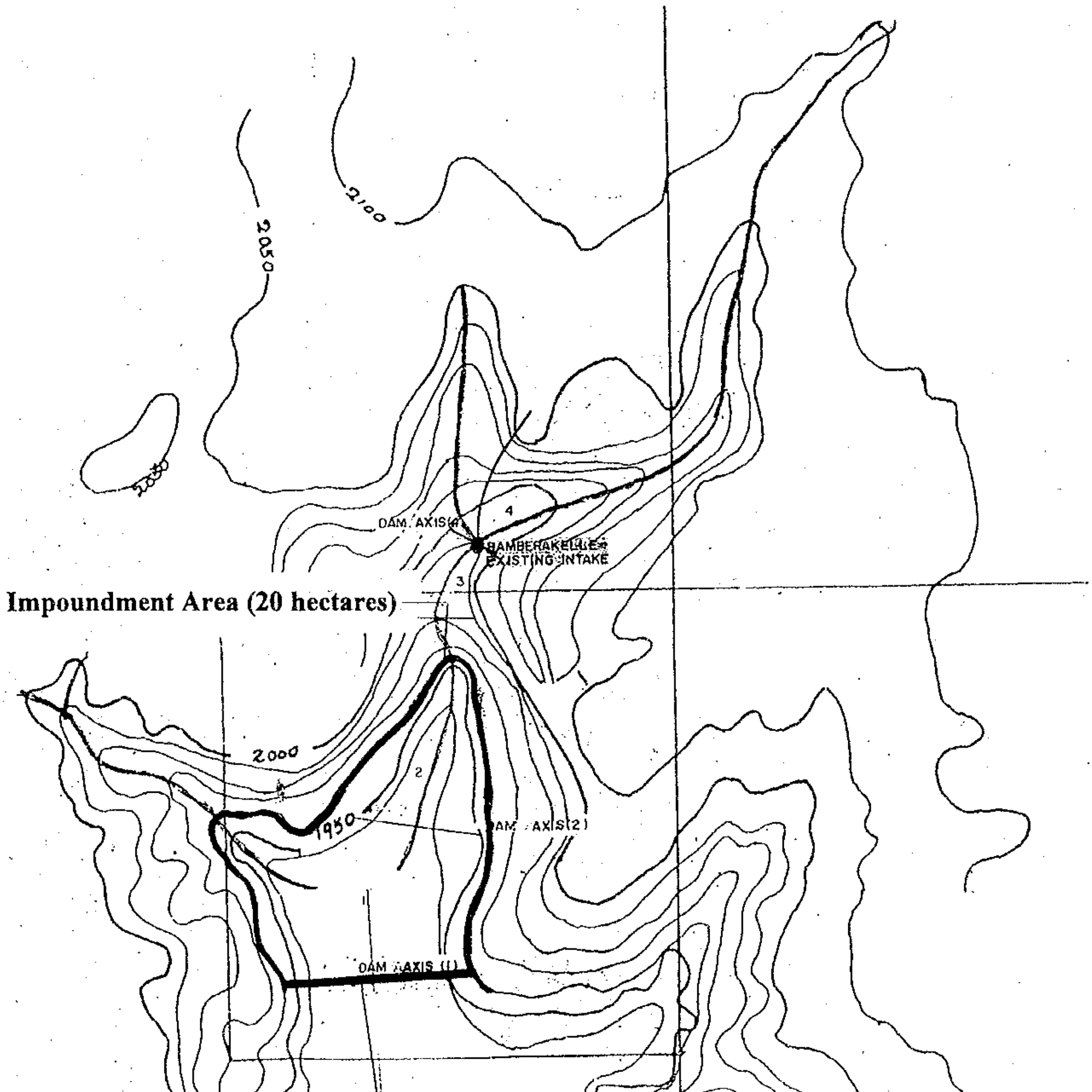


Figure 2 Proposed Bambarakele Dam Site

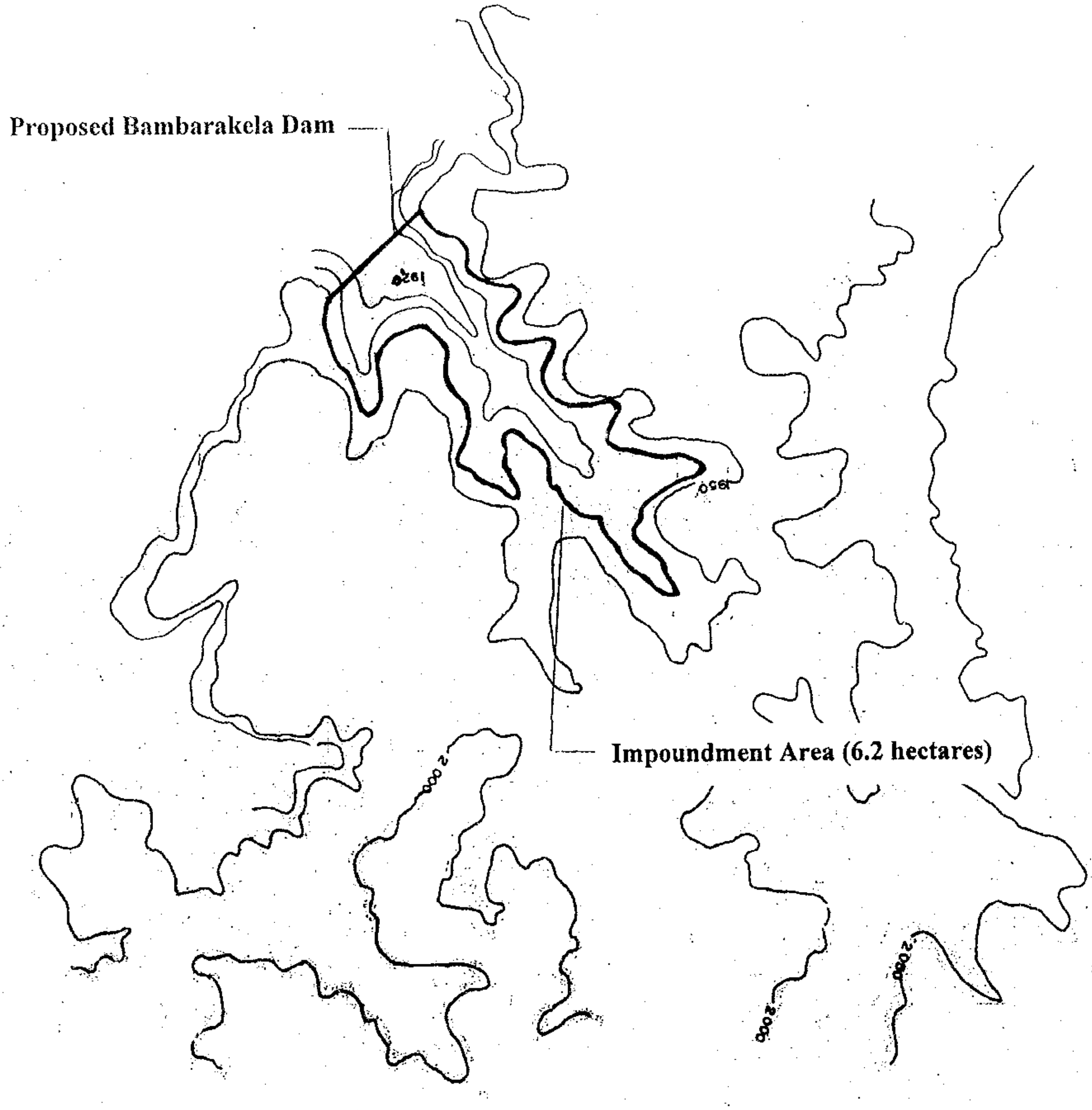


Figure 3 Proposed Jayalanka Dam Site

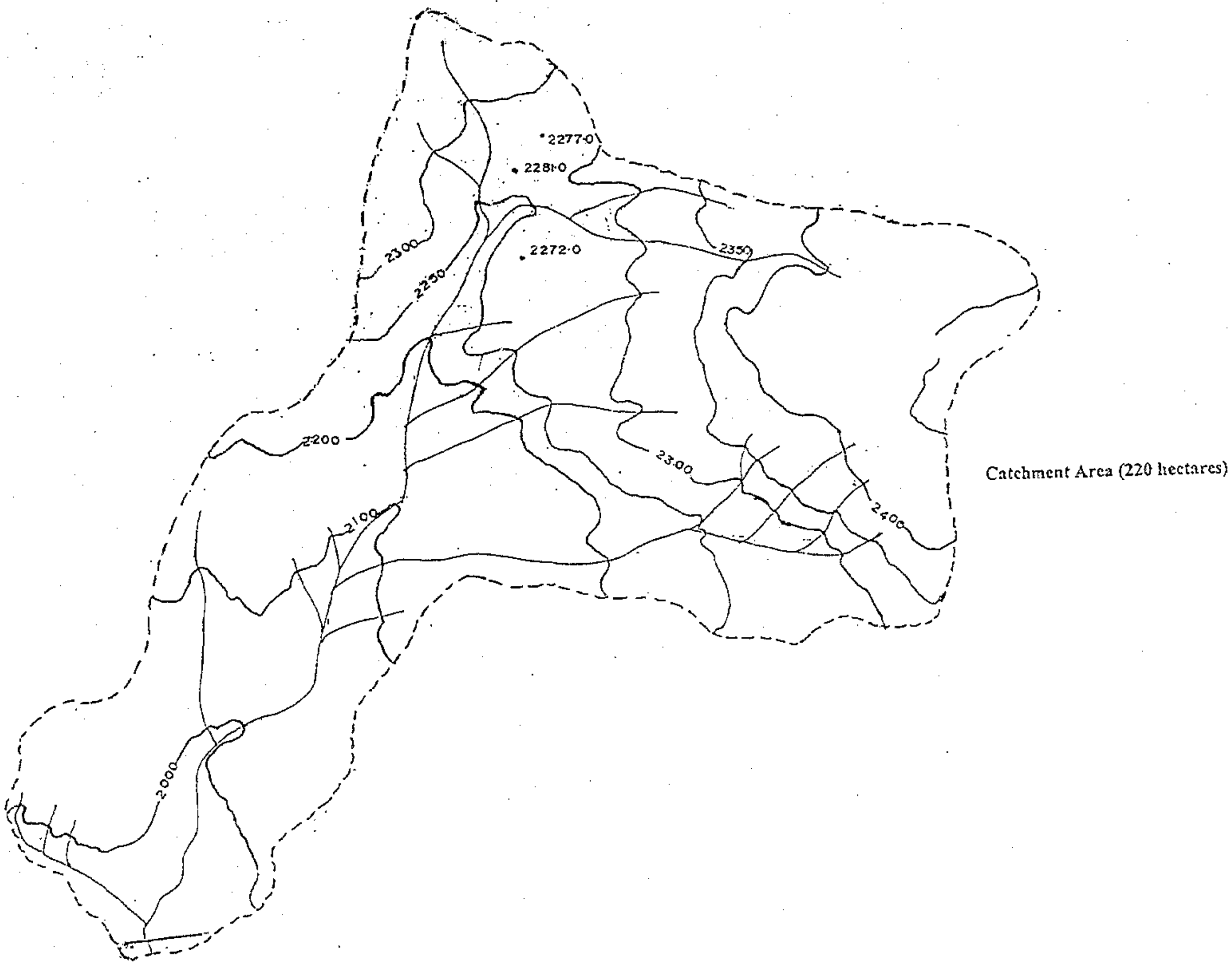


Figure 4 Bambarakele Catchment Area

Figure 5 Jayalanka Catchment Area

Table 2 Estimated Costs for Alternative Nuwara Eliya Water Sources

Item	Jayalanka	Bambarakele	Groundwater
Capital Cost (Rs.)			
Impoundment reservoir			
145,000 m^3	-	270,000,000	-
178,000 m^3	332,000,000	-	-
Subtotal-Impoundment	**332,000,000**	**270,000,000**	-
Treatment Plant			
4,250 m^3/d	-	106,300,000	-
5,950 m^3/d	148,800,000	-	-
Subtotal-Treatment Plant	**148,800,000**	**106,300,000**	-
Pumping facilities	**2,100,000**	**6,000,000**	**7,000,000**
Transmission Main			
5,900 m 250mm diam.	-	45,200,000	-
5,500 m 300mm diam.	55,200,000	-	-
2,300 m 75mm diam.	-	-	4,400,000
500 m 100mm diam.	-	-	1,100,000
Subtotal-Transmission Mains	**55,200,000**	**45,200,000**	**5,500,000**
Wells	-	-	**16,000,000**
Land Acquisition	**150,000,000**	**46,000,000**	**2,100,000**
Resettlement	**20,000,000**	**5,000,000**	-
Totals	**708,100,000**	**478,500,000**	**30,600,000**
Amortized Capital Cost (Rs./yr)			
Impoundment reservoir (50 year life)	39,840,000	32,400,000	-
Treatment Plant (30 year life)	18,451,200	13,181,200	-
Pump Facilities (20 year life)	281,400	804,000	938,000
Transmission Main (30 year life)	6,844,800	5,604,800	682,000
Well (20 year life)	-	-	2,144,000
Land Acquisition (50 years)	18,000,000	5,520,000	252,000
Resettlement (50 years)	2,400,000	600,000	-
Total Amortized Cost (Rs./yr)	**85,817,400**	**58,110,000**	**4,016,000**
O&M cost			
Power	424,000	9,821,000	1,200,000
Maintenance	10,547,000	9,152,000	630,000
Total O&M Cost (Rs./yr)	**10,971,000**	**18,973,000**	**1,830,000**
Average Annual Cost (Rs./yr)	**96,788,400**	**77,083,000**	**5,846,000**
Available Yield (m^3/day)	**5,950**	**2,800**	**900**
Unit Cost (Rs./m^3)	**44.57**	**75.42**	**17.80**

3. Water Source Development Strategy

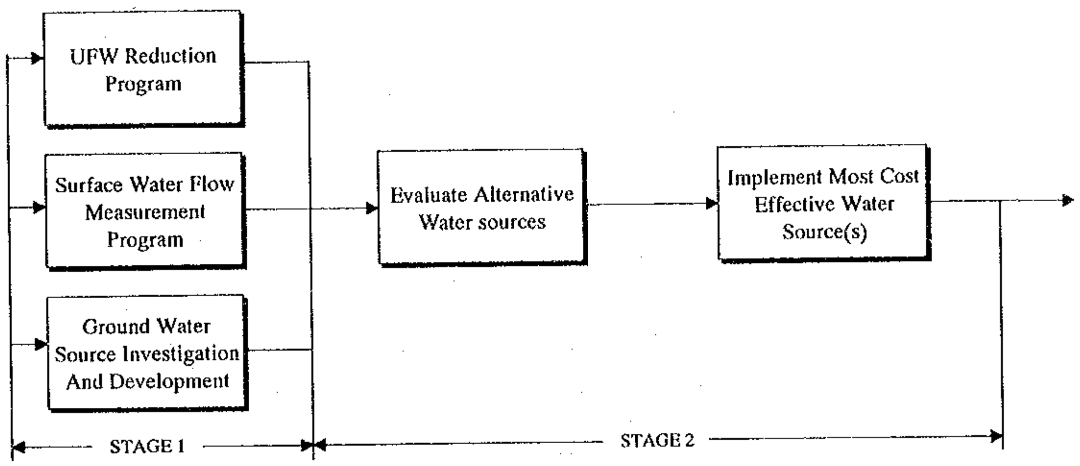
A comparison of estimated unit costs for the alternative water sources discussed above is presented in Table 2. As indicated in Table 2, the least expensive new water source is groundwater, with both of the surface water sources costing four to five times as much as groundwater. It is interesting to note that the average cost of water to Nuwara Eliya water utility customers in 1997 was Rs 2.15 per m^3. When compared to the cost of any of the potential new sources, it is obvious that water rates can be expected to escalate dramatically as new sources are developed.

The unit costs shown in Table 2 include only the cost of new sources and are for illustrative purposes only. At this stage of the Study, only preliminary estimates have been developed for the cost shown in Table 2. Although these costs will be substantially modified when the inexpensive existing water sources and the cost of modifications to the distribution system that will be required to accommodate the new sources are taken into account, they are still expected to be far higher than present day billing rates. Should current plans to implement a sewerage system be carried out, the perceived increase in costs to the average family will be higher still. The bulk of the existing sources are surface sources that can be fed by gravity to the distribution system. The low operating costs of this type of source, together with the fact that that most of the capital costs associated with these systems were retired long ago, has resulted in the exceptionally low costs enjoyed by the existing water utility customers

NRW is exceptionally high in the Nuwara Eliya system at 56 percent of production. Given the high cost of new sources relative to existing sources, it is obvious that any reduction in NRW that can be effected will result in a substantial lowering of future water rates. A high priority should therefore be given to NRW reduction and made an integral part of any future water supply augmentation plans.

Given the above, the recommended strategy for meeting future Nuwara Eliya water supply needs is to pursue a two stage development procedure, as illustrated in Figure 6. The first stage would concentrate on development of the least expensive alternative for augmenting supplies, namely groundwater. Stage one would also include investigations to establish the maximum potential yield from groundwater, a high priority NRW reduction progiam and a hydrological data collection program (stream flow, rainfall, topographic surveys and geotechnical information) aimed at providing sufficient data for a reliable technical evaluation of the potential surface sources. Stage two would involve evaluation of alternative water sources based on information gained during stage one, and implementation of the most cost effective mix of sources.

Figure 6 Water Source Development Strategy for Nuwara Eliya



Appendix 5.2 Specification for Potable Water, SLS 614 (1983)

Part 1 - Physical and Chemical Requirements

Characteristics	Max. Desirable Level	Max. Permissible Level
PH	7.0-8.5 units	6.5-9.0 units
Colour	5 units	30 units
Odour	Unobjectionable	Unobjectionable
Taste	"	"
Turbidity	2-JTU	8-JTU
Elect. Conductivity	750 μS/cm	3,500 μS/cm
Chloride (Cl)	200 mg/l	1,200 mg/l
Chlorine - Free Residual (Cl)	-	0.2 "
Alkalinity (as $CaCO_3$)	200 mg/l	400 "
Ammonia-Free	-	0.06 "
Ammonia-Albuminoid	-	0.15 "
Nitrate (as N)	-	10
Nitrite (as N)	-	0.01 "
Fluoride (as F)	0.6 mg/l	1.5 "
Phosphates - Total (PO)	-	2.0 "
Total Solids	500 mg/l	2,000 "
Hardness Total (as $CaCO_3$)	250 "	600 "
Iron-Total (as Fe)	0.3 "	1.0 "
Sulphate	200 "	400 "
Calcium	100 "	240 "
Magnesium	30 to 150 *	150 "
Copper	0.05 mg/l	1.5 "
Manganese	0.05 "	0.5 "
Zinc	5.0 "	15.0 "
Aluminium	-	0.2 "
Arsenic	-	0.05 "
Cadmium	-	0.005 "
Cyanide	-	0.05 "
Lead	-	0.05 "
Mercury	-	0.001 "
Selenium	-	0.01 "
Chromium	-	0.05 "
Anionic Detergents (as MBAS-LAS)	0.2 "	1.0 "
Phenolic Compounds (as Phenolic OH)	0.001 "	0.002 "
Oil & Grease	-	1.0 "
Pesticide Residue	(Refer to WHO & FAO requirements)	
Chemical Oxygen Demand (COD)	-	10 mg/l

* Depending on Sulphate content, i.e. for 205 mg/l Sulphate, max. Mg is 30 mg/l; for less sulphate, more Mg is allowed.

Appendix 5.2 Specification for Potable Water, SLS 614 (1983)

Part 2 - Bacteriological Requirements

Requirements
1. Pipe born water supplies:
- Throughout any year, 95 percent of the samples shall not contain any coliform organisms in 100 ml.
- None of the samples examined shall contain more than 10 coliform organisms per 100 ml.
- Coliform organisms shall not detectable in 100 ml of any two consecutive samples.
- None of the samples examined shall contain E. Coli. in 100 mg/l I (Fecal coliform)
2. Individual and small community supplies
- None of the samples examined shall contain more than 20 coliform organisms per 100 mg/l on repeated examination.
- No sample shall contain E. Coliform in 100 mg/l (Fecal coliform)

Note: Individual or small community supplies include wells, bores and springs

Appendix5.3 Recommended Peak Factor

1.1 Establishment of Load Factor to Estimate Daily Maximum Water Demand

Capacity of transmission line and distribution reservoir shall be determined based on the daily maximum water demand. In this study, the daily maximum water demand was estimated due to absence of past performance record/data.

In setting up of load factor (= daily average water demand/daily maximum water demand), actual performance data by size of water supply system in Japan was referred to. However, if UFW occupies considerable part of supply amount, the Japanese data may not be applied directly, while the effective supply amount basis (excluding UFW) of Japanese data may be applied similarly this study, since tendency of water consumption is deemed to be mostly similar in every country.

In this section, load factor was studied based on the following formula in application of some modification taking into account difference of UFW ratio.

Supply amount may be categorized as shown in the following figure and various coefficients are given by following formula. In the figure, most of non effective supply amount is deemed to be leakage and is assumed to be equal in both daily average supply amount and daily maximum supply amount.

Load factor R1 = A/B (Load factor is generally defined by this formula)... ... ... (1)
Effective ratio R2 = C/A... ... ... (2)
Non effective ratio R3 = D/A = (1 - C/A) ... ... (3)
Daily average supply amount A = C + D = C + A*R3 ... ... (4)
Daily maximum supply amount B = E + F = E + A*R3 ... ... (5)
Daily average effective supply amount C = A - D = A - A*R3 = (1 - R3)*A ... ... (6)

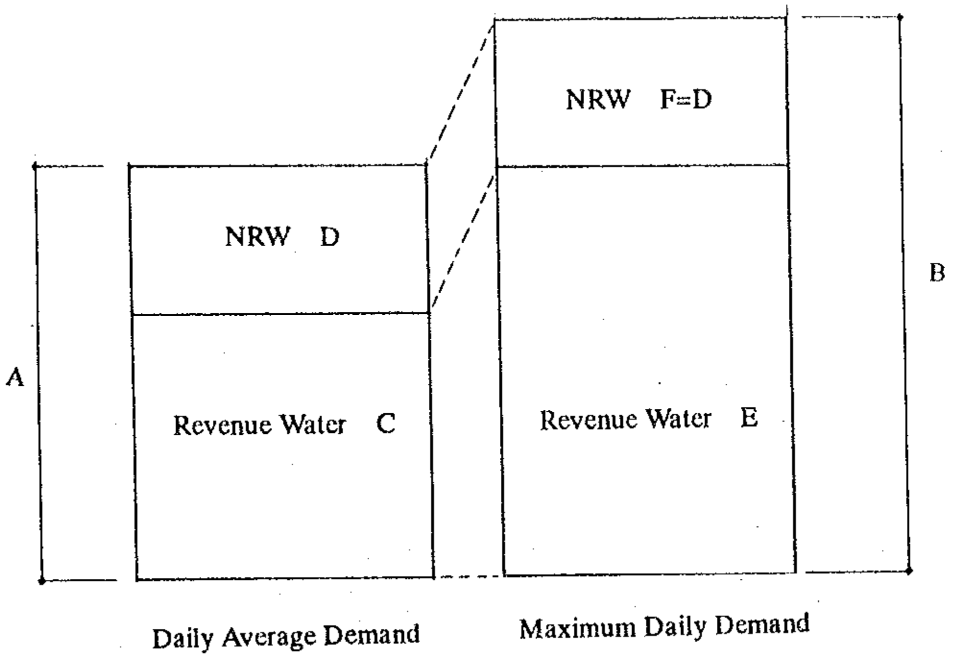


Figure 5.3.1 Supply Amount of RevenueWater and Non Revenue Water

Based on the above, modified load factor (R) can be expressed with R1 and R3 as follows:

Modified load factor R = C/(C + A*R3/R1 - A*R2 = R1*(1 - R3)/(1 - R1*R3) .... (8)

Load factor (R1) can be expressed with R and R3 as follows:

Load factor R1 = A/B = (C + A*R3)/(C/R + A*R3) = R/(1-(1-R)*R3) ... ... (9)

Now, load factors R1 and effective ratio R1 (or non effective ratio) are known figures by size of water supply system based on the Water Supply Statistics of Japan, the modified load factor (R) can be estimated as follows.

Table 5.3.1 Past Performance Data of Load Factor and Effective Ratio in Japan

Served Population (person)	Load Factor (%)	Effective Ratio (%)
500,000～1,000,000	82.5	94.0
50,000～100,000	79.6	90.3
30,000～50,000	78.1	87.5

Note: Water Supply Statistics of Japan, 1993

Load factor in Nuwara Eliya is estimated referring to the above table as follows:

Modified load factor R = (0.796 x (1 - 0.097)/(1 - 0.796 x 0.097) = 0.779

Load factor R1 = 0.779/(1 - (1 - 0.779) x 0.25) = 0.825

Coefficient to estimate the daily maximum supply amount is given as a reciprocal number of the load factor:

1/R1 = 1.21 say 1.2

When load factor of Greater Kandy is estimated in the same manner:

Modified load factor R = (0,825 x (1 - 0.060)/(1 - 0.825 x 0.060) = 0.816

Load factor R1 = 0.816/(1 - (1 - 0.816) x 0.25) = 0.855

Coefficient of the daily maximum supply amount is:

1/R1 = 1.17 say 1.2

1.2 Peak Factor

Capacity of distribution lines is to be determined based on the hourly maximum water demand or peak factor. However, the hourly maximum water demand or peak factor shall be estimated due to absence of past performance record/data in Nuwara Eliya as described in the previous section, Load Factor.

Peak factor (= hourly maximum supply amount/daily maximum supply amount) is likewise determined referring to the Japanese past performance data. It shall be noted that hourly fluctuation coefficient in Japan and peak factor in the study area are given different definitions, as follows:

Hourly fluctuation coefficient in Japan:

K = (hourly maximum supply amount)/(daily maximum supply amount)

Peak factor in the study area:

Peak factor = (hourly maximum supply amount)/(daily average supply amount)

Based on the above-mentioned difference of definition, peak factor in the study area shall be determined in application of load factor of daily maximum supply amount to the hourly fluctuation coefficient as follows:

Peak factor in the study area
= (Hourly fluctuation coefficient in Japan; K) x
(Load factor of daily maximum supply amount)

The hourly fluctuation coefficient in Japan is shown in the following figure.
Since Nuwara Eliya has daily maximum supply amount of about 10,000 cu.m/day, the hourly fluctuation coefficient (K) in Japan is considered to be 1.78, while load factor of daily maximum supply amount is estimated at 1.2. Thus, peak factor in the study area is estimated as follows:

Peak factor in study area = 1.78 x 1.2 = 2.1 say 2.0

In ADB D/R/D page 7 (Feb. 1998), peak factor is defined at 2.0.

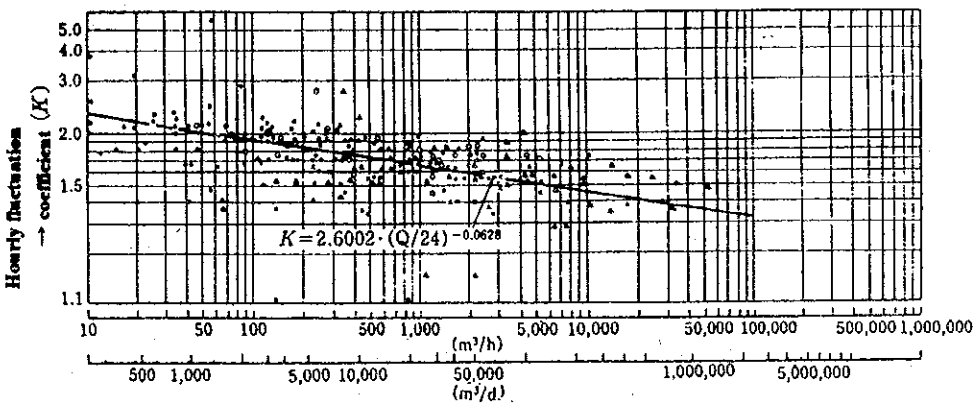


Figure 5.3.2 Relationship between Distributed Volume and Hourly Fluctuation Coefficient

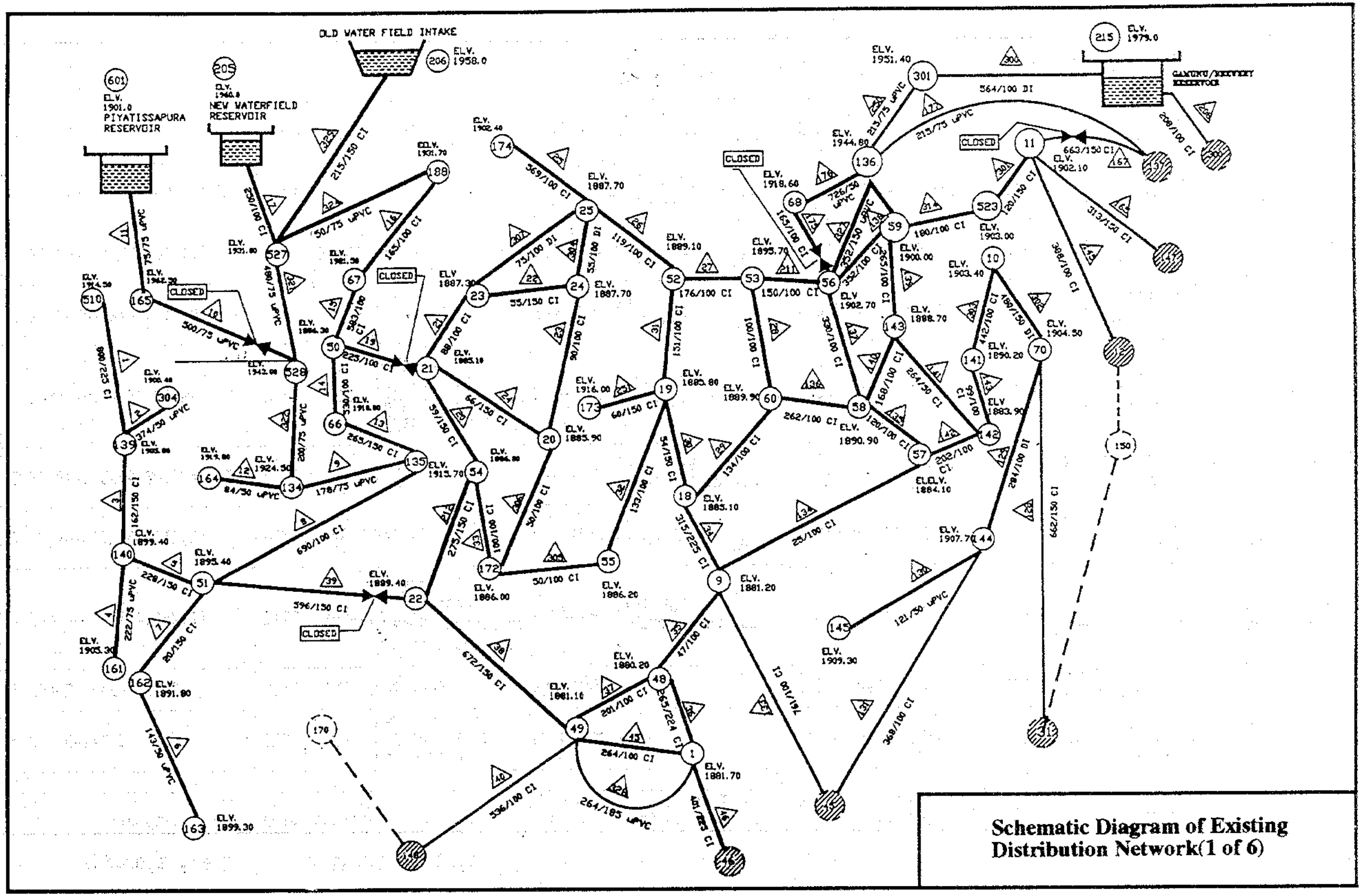
Appendix 5.4 Water Supply System Hydraulic Analysis

Appendix 5.4.1	Hydraulic Analysis of Network
Appendix 5.4.2	Node Demand List for Network Analysis (Year 2015)
Appendix 5.4.3	Node Demand List for Network Analysis (Year 2005)
Appendix 5.4.4	Magnification of Node Demand for Network Analysis
Appendix 5.4.5	Calculation of Node Demand for Vijithapura and Unique View Hill Reservoir
Appendix 5.4.6	Calculation of Node Demand for High Area 1 Reservoir

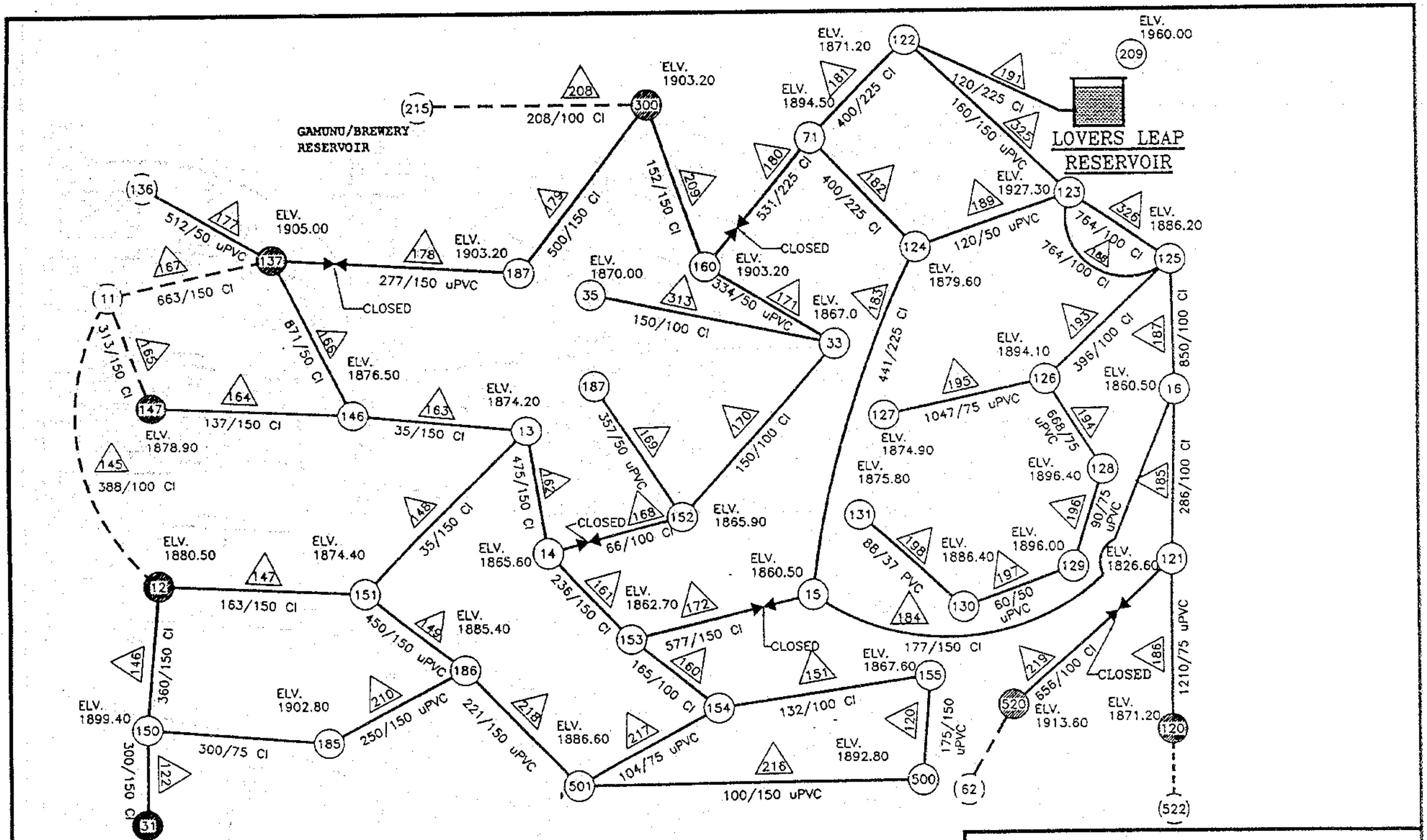
Appendix 5.4 Water Supply System Hydraulic Analysis

Appendix 5.4.1 NetWork Analysis

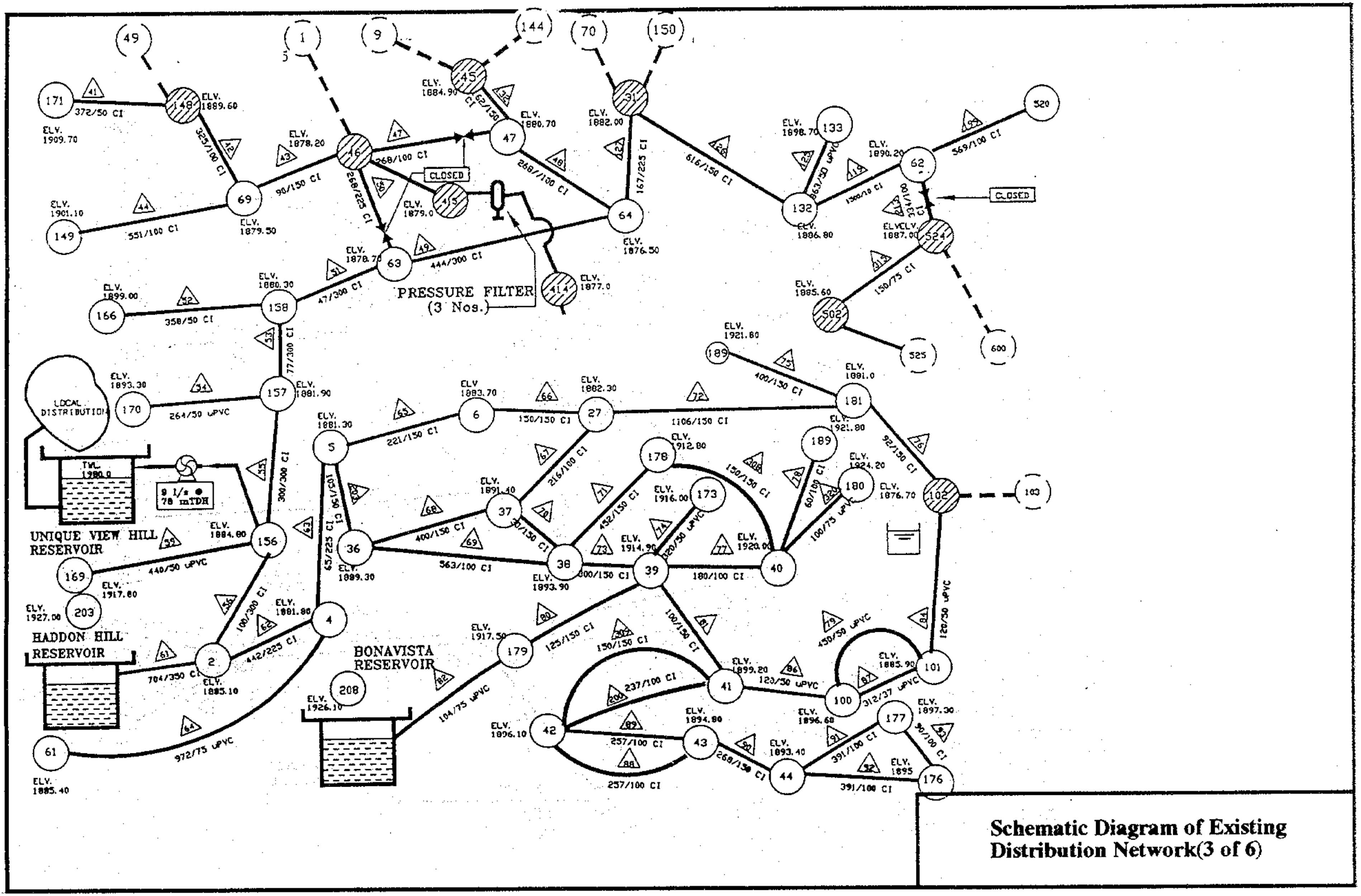
	File Name	Main	Season	Purpose	NetWork Type	Augmentation of NetWork	Demand			Condition of Reservoir	
							Year	Type	Magnifcation		
A	NuwaExist01	Dist	All	Culculatin for Cefficient of Leakage	Existing	None	1,995	Daily Mean	0.739	All Reservoir is Free Discharge	
B	NuwaExistYear2015	Dist	All	Pressure	Existing	None	2,015	Hourly Max	1.622	All Reservoir is Free Discharge	
C	Nuwara201Year1995(2)	Dist	Dry	Effectiveness of Leakage Reduction for Proposed NetWork	Proposed	Augmentation For Year 2015	1,995	Daily Mean	0.739	Node of Demand No.205,206,215,209	The Others are Free Discharge
D	Nuwara011Year2015(2)	Dist	Dry	Pressure	Proposed	Augmentation For Year 2015	2,015	Hourly Max	1.622	Node of Demand No.205,206,215,209	The Others are Free Discharge
E	Nuwara012Year2015Mean(2)	Dist	Dry	Leakage	Proposed	Augmentation For Year 2015	2,015	Daily Mean	0.811	Node of Demand No.205,206,215,209	The Others are Free Discharge
F	Nuwara012Year1995Mean(3)	Dist	Rainy	Effectiveness of Leakage Reduction for Proposed NetWork	Proposed	Augmentation For Year 2015	1,995	Daily Mean	0.739	All Reservoir is Free Discharge	Excluding Pedro
G	Nuwara011Year2015(3)	Dist	Rainy	Pressure	Proposed	Augmentation For Year 2015	2,015	Hourly Max	1.622	All Reservoir is Free Discharge	Excluding Pedro
H	Nuwara011Year2015(4)	Dist	Rainy	Leakage	Proposed	Augmentation For Year 2015	2,015	Daily Mean	0.811	All Reservoir is Free Discharge	Excluding Pedro
I	Nuwara103Year2005FSDry	Dist	Dry	Pressure	Proposed	Augmentation For Year 2005	2,005	Hourly Max	1.547	Node of Demand No.205,206,215,209	The Others are Free Discharge
J	Ntm01	Trans	Rainy	Pressure	Proposed	Augmentation For Year 2015	2,015	Daily Max	1.000	All Reservoir is Free Discharge	
K	Ntm02	Trans	Rainy	Pressure	Proposed	Augmentation For Year 2005	2,005	Daily Max	1.000	All Reservoir is Free Discharge	



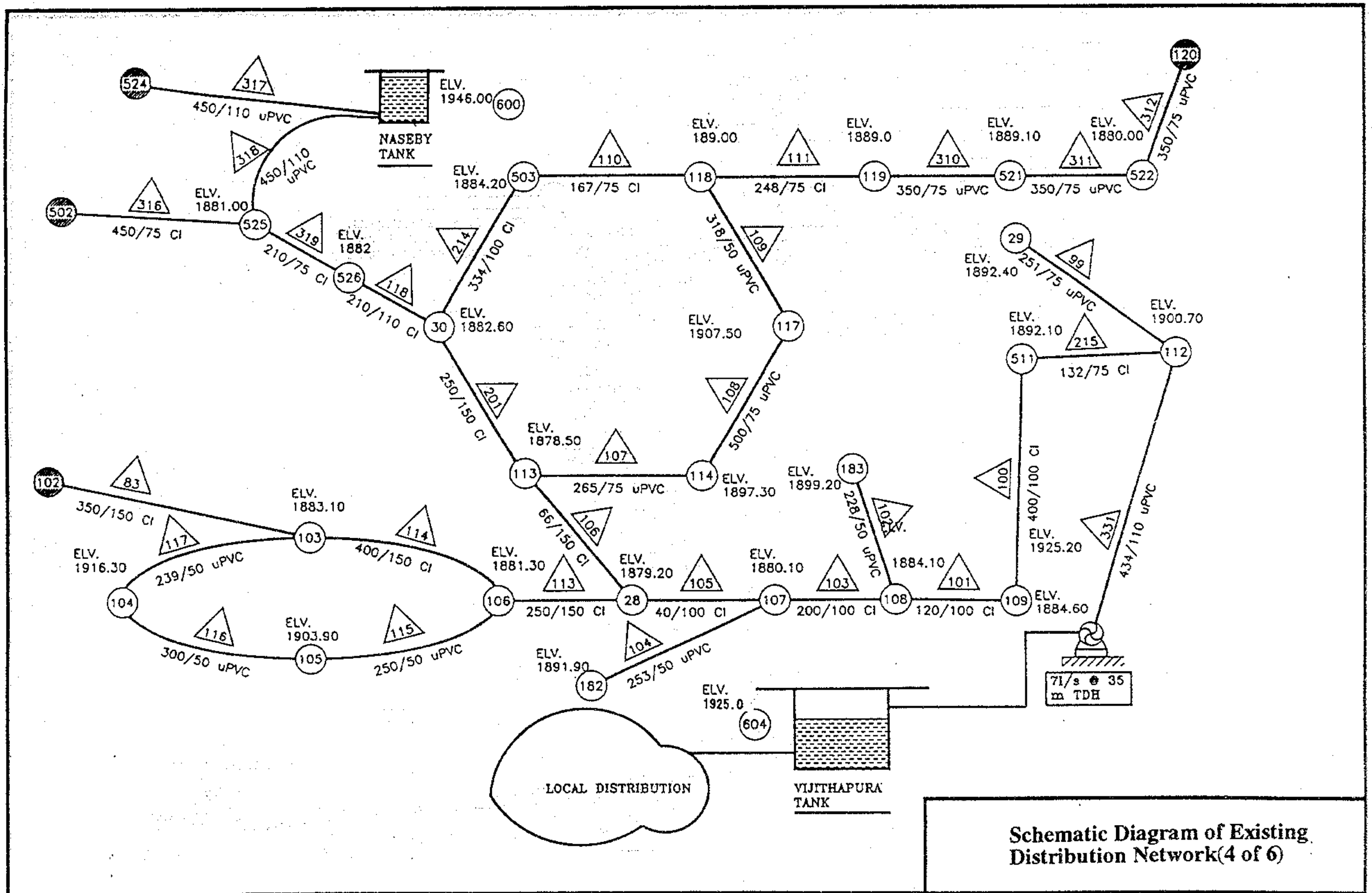
Schematic Diagram of Existing Distribution Network(1 of 6)



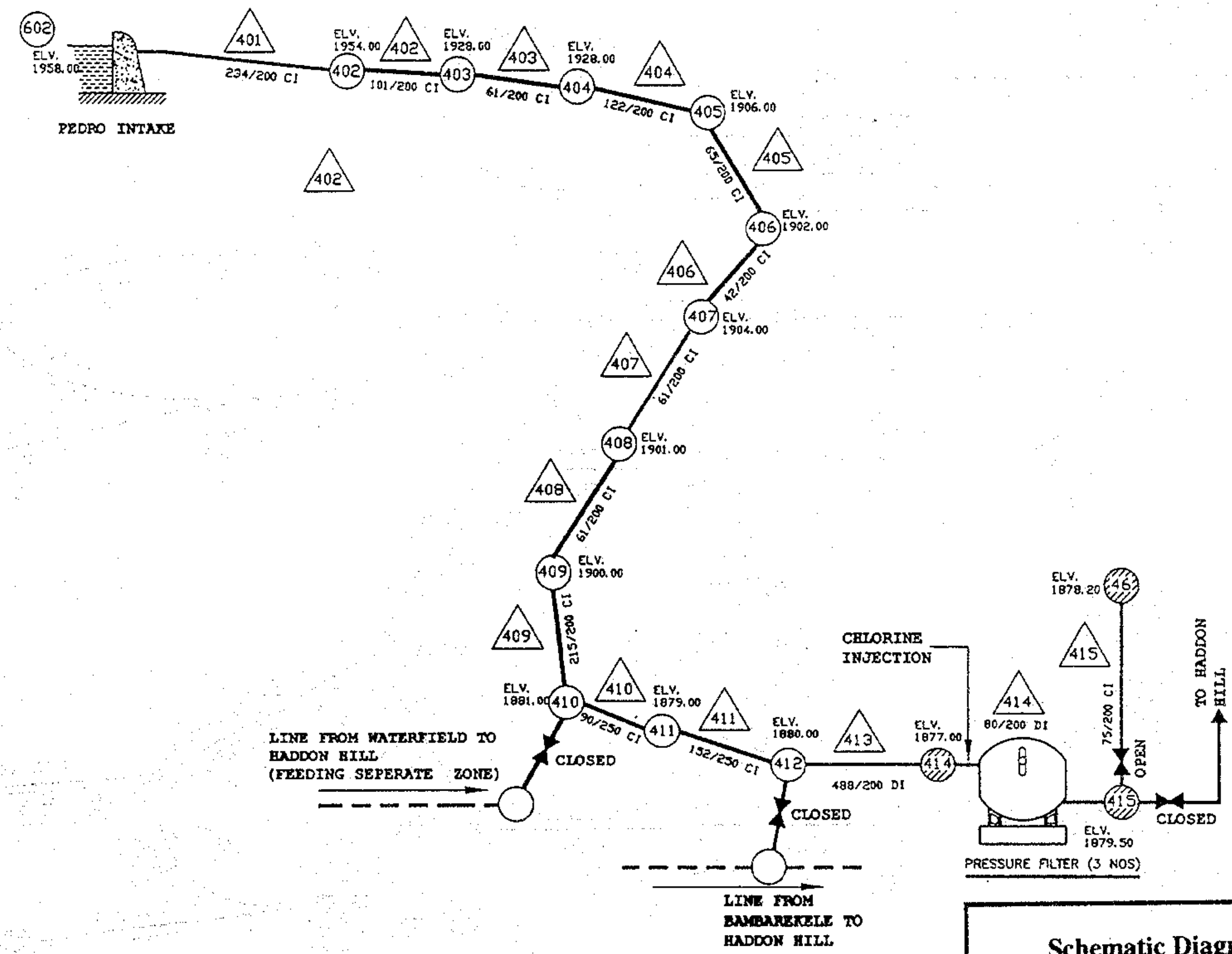
Schematic Diagram of Existing Distribution Network(2 of 6)



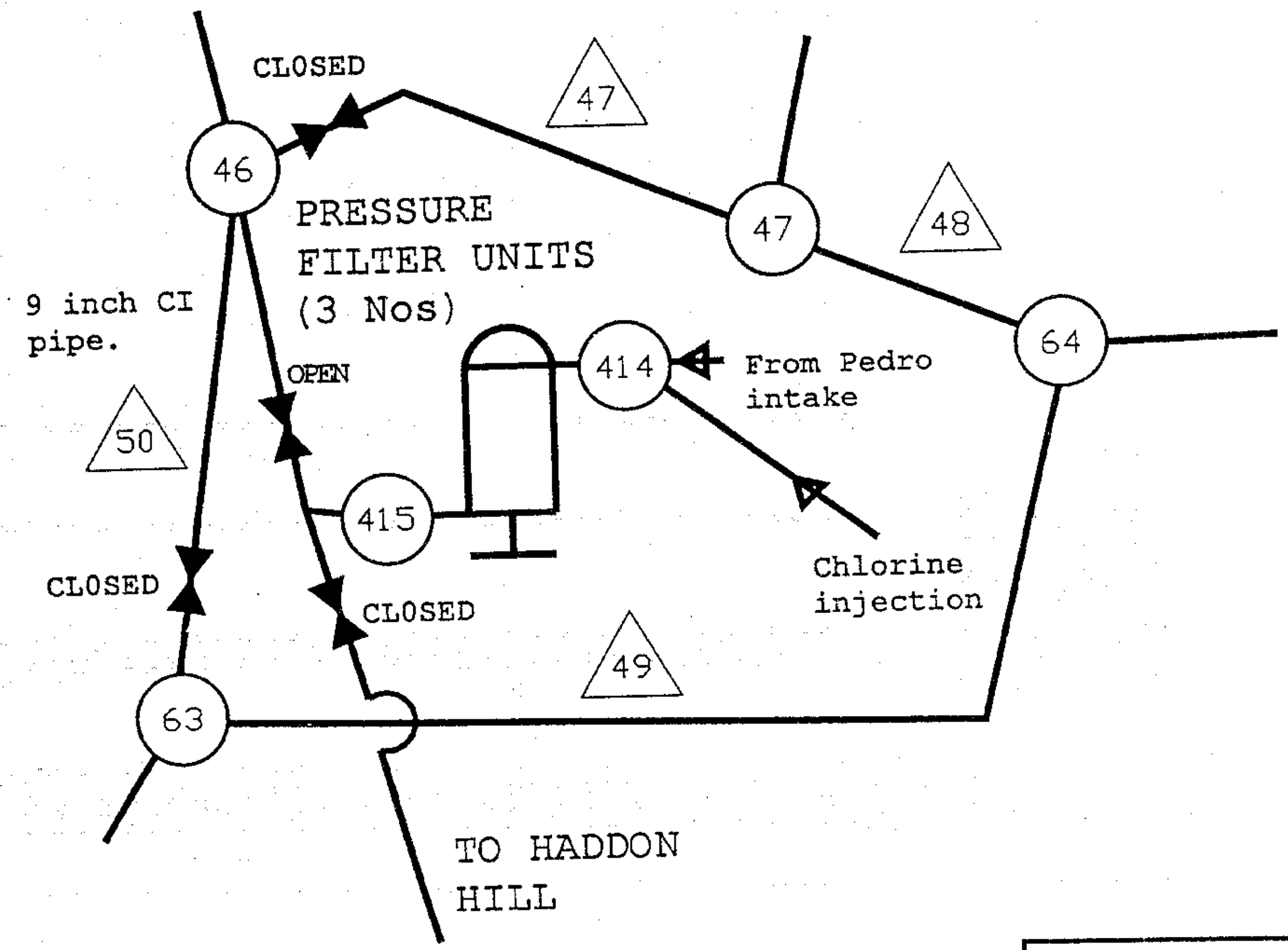
Schematic Diagram of Existing
Distribution Network(3 of 6)



Schematic Diagram of Existing Distribution Network(4 of 6)



Schematic Diagram of Existing Distribution Network(5 of 6)



Schematic Diagram of Existing Distribution Network(6 of 6)

Net Work Analysis   Distribution Main

File Name	NuwaraExist01	A
Season	All	
Network Type	Existing	
Demand	Year 1995	
	Day Mean	
Reserver	Water Level Fix	All
	Discharge Fix	None

Magnification of Demand 0.739

Reservoir Data

Node		HWL (MSL)	LWL (MSL)	Reservoir
203	1	1,927.0	1,927.0	Haddon Hill
205	1	1,960.0	1,960.0	New Water Field
206	1	1,958.0	1,958.0	Old Water Field
208	1	1,930.0	1,930.0	Bonavista
209	1	1,960.0	1,960.0	Lovers Leap
215	1	1,979.0	1,979.0	Gamunu/Brewery
600	1	1,946.0	1,946.0	Naseby
601	1	1,991.0	1,991.0	Piyatissapura
602	1	1,958.0	1,958.0	Pedro Intake

Node Data

Node		Ground Elev (MSL)	Demand (cum/d)		
1	1	1,881.7	122.0	0	0
2	1	1,885.1	70.0	0	0
4	1	1,881.8	76.0	0	0
5	1	1,881.3	40.0	0	0
6	1	1,883.7	76.0	0	0
9	1	1,881.2	133.0	0	0
10	1	1,903.4	25.0	0	0
11	1	1,902.1	86.0	0	0
12	1	1,880.5	66.0	0	0
13	1	1,874.2	51.0	0	0
14	1	1,865.6	66.0	0	0
15	1	1,860.5	61.0	0	0
16	1	1,860.5	85.0	0	0
18	1	1,885.1	107.0	0	0
19	1	1,885.8	85.0	0	0
22	1	1,889.4	79.0	0	0
23	1	1,887.3	82.0	0	0
24	1	1,887.7	117.0	0	0
25	1	1,887.0	51.0	0	0
27	1	1,882.3	75.0	0	0
28	1	1,879.2	26.0	0	0
29	1	1,892.4	13.0	0	0
30	1	1,882.6	80.0	0	0
31	1	1,882.0	93.0	0	0
36	1	1,889.3	51.0	0	0
37	1	1,891.4	47.0	0	0
38	1	1,893.9	42.0	0	0
39	1	1,914.9	50.0	0	0
41	1	1,899.2	44.0	0	0
42	1	1,896.1	38.0	0	0
43	1	1,894.8	40.0	0	0
44	1	1,893.4	54.0	0	0
45	1	1,884.9	67.0	0	0
46	1	1,878.2	127.0	0	0
47	1	1,880.7	36.0	0	0
48	1	1,880.2	101.0	0	0
49	1	1,881.1	160.0	0	0
50	1	1,886.3	144.0	0	0
51	1	1,895.4	47.0	0	0
52	1	1,889.1	97.0	0	0
55	1	1,886.2	89.0	0	0
56	1	1,902.7	49.0	0	0
57	1	1,884.1	93.0	0	0
58	1	1,890.9	119.0	0	0
60	1	1,889.9	100.0	0	0

61	1	1,885.4	50.0	0	0
62	1	1,890.2	76.0	0	0
63	1	1,878.7	38.0	0	0
64	1	1,876.5	44.0	0	0
66	1	1,910.0	40.0	0	0
67	1	1,921.5	38.0	0	0
68	1	1,918.6	42.0	0	0
69	1	1,879.5	50.0	0	0
70	1	1,904.5	132.0	0	0
71	1	1,894.5	87.0	0	0
100	1	1,896.6	33.0	0	0
101	1	1,885.9	25.0	0	0
102	1	1,876.7	37.0	0	0
103	1	1,883.1	50.0	0	0
104	1	1,916.3	19.0	0	0
105	1	1,903.9	17.0	0	0
106	1	1,881.3	43.0	0	0
107	1	1,880.1	32.0	0	0
108	1	1,884.1	30.0	0	0
109	1	1,884.6	20.0	0	0
112	1	1,900.7	0.0	0	0
113	1	1,878.5	29.0	0	0
114	1	1,897.3	57.0	0	0
117	1	1,907.5	59.0	0	0
118	1	1,889.0	37.0	0	0
119	1	1,889.1	64.0	0	0
120	1	1,871.2	113.0	0	0
121	1	1,862.6	109.0	0	0
122	1	1,950.0	89.0	0	0
123	1	1,927.3	65.0	0	0
124	1	1,879.6	68.0	0	0
125	1	1,886.2	108.0	0	0
126	1	1,894.1	107.0	0	0
127	1	1,874.9	54.0	0	0
128	1	1,896.4	38.0	0	0
129	1	1,896.0	8.0	0	0
130	1	1,886.4	7.0	0	0
131	1	1,875.8	4.0	0	0
132	1	1,886.8	51.0	0	0
133	1	1,898.7	18.0	0	0
134	1	1,924.5	54.0	0	0
135	1	1,915.7	58.0	0	0
136	1	1,944.8	71.0	0	0
137	1	1,905.0	118.0	0	0
139	1	1,905.8	165.0	0	0
140	1	1,899.4	31.0	0	0
141	1	1,890.2	99.0	0	0
142	1	1,883.9	103.0	0	0
143	1	1,888.7	110.0	0	0
144	1	1,907.4	39.0	0	0
145	1	1,909.3	6.0	0	0
146	1	1,876.5	54.0	0	0
147	1	1,878.9	98.0	0	0
148	1	1,889.6	63.0	0	0
149	1	1,901.1	28.0	0	0
150	1	1,899.4	118.0	0	0
151	1	1,874.4	76.0	0	0
152	1	1,865.9	66.0	0	0
153	1	1,862.7	71.0	0	0
154	1	1,864.7	66.0	0	0
155	1	1,867.6	22.0	0	0
156	1	1,884.8	40.0	0	0
157	1	1,881.9	24.0	0	0
158	1	1,880.3	24.0	0	0
160	1	1,903.2	19.0	0	0
161	1	1,905.3	11.0	0	0
162	1	1,891.8	38.0	0	0
163	1	1,899.3	7.0	0	0
164	1	1,919.8	4.0	0	0
165	1	1,962.5	101.0	0	0
166	1	1,899.0	18.0	0	0
169	1	1,917.8	22.0	0	0
170	1	1,893.3	13.0	0	0
171	1	1,909.7	19.0	0	0
21	1	1,885.1	97.0	0	0

20	1	1,885.9	83.0	0	0
174	1	1,902.4	104.0	0	0
53	1	1,895.7	97.0	0	0
176	1	1,895.0	23.0	0	0
177	1	1,897.3	23.0	0	0
178	1	1,912.8	55.0	0	0
179	1	1,917.5	25.0	0	0
181	1	1,881.0	80.0	0	0
182	1	1,891.9	13.0	0	0
183	1	1,899.2	12.0	0	0
185	1	1,902.8	66.0	0	0
186	1	1,885.4	66.0	0	0
187	1	1,903.2	76.0	0	0
188	1	1,931.7	8.0	0	0
189	1	1,921.8	29.0	0	0
300	1	1,903.6	47.0	0	0
301	1	1,951.4	76.0	0	0
402	1	1,955.5	0.0	0	0
403	1	1,954.4	0.0	0	0
404	1	1,953.8	0.0	0	0
405	1	1,952.5	0.0	0	0
406	1	1,951.8	0.0	0	0
407	1	1,951.3	0.0	0	0
408	1	1,950.7	0.0	0	0
409	1	1,950.0	0.0	0	0
410	1	1,947.8	0.0	0	0
411	1	1,947.4	0.0	0	0
412	1	1,946.9	0.0	0	0
414	1	1,941.7	0.0	0	0
415	1	1,940.8	0.0	0	0
59	1	1,900.0	122.0	0	0
500	1	1,892.8	25.0	0	0
501	1	1,886.6	76.0	0	0
502	1	1,885.6	80.0	0	0
503	1	1,884.2	76.0	0	0
510	1	1,914.5	51.0	0	0
511	1	1,892.1	20.0	0	0
520	1	1,913.6	63.0	0	0
304	1	1,900.4	70.0	0	0
172	1	1,886.0	51.0	0	0
173	1	1,916.0	51.0	0	0
521	1	1,886.0	51.0	0	0
522	1	1,880.0	51.0	0	0
523	1	1,903.0	51.0	0	0
524	1	1,887.0	51.0	0	0
525	1	1,881.0	51.0	0	0
526	1	1,882.0	51.0	0	0
527	1	1,931.0	30.0	0	0
528	1	1,943.0	30.0	0	0
33	1	1,867.0	51.0	0	0
35	1	1,870.0	61.0	0	0
40	1	1,920.0	40.0	0	0
54	1	1,886.0	51.0	0	0
540	1	1,930.0	406.0	0	0
541	1	1,980.0	558.0	0	0

Booster Pump Data

No.	Type	Node A	Node B	Pipe No.	Pressure (m)
1	B	156	541	330	71.0
2	B	112	540	331	26.0

Pipe Data

Pipe No.	Node A	Node B	Diameter (mm)	Length (m)	C Value
1	139	510	225.0	800.0	120.0
2	139	304	44.0	374.0	130.0
3	139	140	150.0	162.0	120.0
4	140	161	65.0	222.0	120.0
5	51	140	150.0	228.0	120.0
6	162	163	44.0	143.0	130.0
7	51	162	150.0	20.0	120.0
8	51	135	100.0	690.0	120.0
9	134	135	65.0	178.0	130.0
12	134	164	44.0	84.0	130.0
13	66	135	150.0	265.0	120.0
14	50	66	100.0	530.0	120.0
15	50	67	100.0	583.0	120.0
16	67	188	100.0	165.0	120.0
20	21	54	150.0	59.0	120.0
21	21	23	100.0	88.0	120.0
22	23	24	150.0	55.0	120.0
23	20	24	100.0	90.0	120.0
24	20	21	150.0	66.0	120.0
25	25	174	100.0	569.0	120.0
26	25	52	100.0	110.0	120.0
27	52	53	100.0	176.0	120.0
28	53	60	100.0	100.0	120.0
29	18	60	100.0	134.0	120.0
30	18	19	150.0	54.0	120.0
31	19	52	100.0	151.0	120.0
32	19	55	100.0	133.0	120.0
33	54	172	100.0	100.0	120.0
34	9	18	225.0	315.0	120.0
35	9	48	100.0	47.0	120.0
36	1	48	225.0	265.0	120.0
37	48	49	100.0	201.0	120.0
38	22	49	150.0	672.0	120.0
40	49	148	100.0	536.0	120.0
41	148	171	50.0	372.0	120.0
42	69	148	100.0	325.0	120.0
43	46	69	150.0	90.0	120.0
44	69	149	100.0	551.0	120.0
45	1	49	100.0	264.0	120.0
46	1	46	225.0	401.0	120.0
48	47	64	100.0	268.0	120.0
49	63	64	300.0	444.0	120.0
51	63	158	300.0	47.0	120.0
52	158	166	50.0	358.0	120.0
53	157	158	300.0	77.0	120.0
54	157	170	44.0	264.0	130.0
55	156	157	300.0	300.0	120.0
56	2	156	300.0	100.0	120.0
59	156	169	44.0	440.0	130.0
61	2	203	350.0	704.0	120.0
62	2	4	225.0	442.0	120.0
63	4	5	225.0	65.0	120.0
64	4	61	65.0	972.0	130.0
65	5	6	150.0	221.0	120.0
66	6	27	150.0	150.0	120.0
67	27	37	100.0	216.0	120.0
68	36	37	150.0	400.0	120.0
69	36	38	100.0	563.0	120.0
70	37	38	150.0	30.0	120.0
71	38	178	150.0	452.0	120.0
72	27	181	150.0	1,106.0	120.0
73	38	39	150.0	300.0	120.0
74	39	173	44.0	320.0	130.0
75	181	189	150.0	400.0	120.0
76	102	181	150.0	92.0	120.0
80	39	179	150.0	125.0	120.0
81	39	41	150.0	100.0	120.0
82	179	208	65.0	104.0	130.0
83	102	103	150.0	350.0	120.0
84	101	102	44.0	120.0	130.0
86	41	100	44.0	120.0	130.0
87	100	101	37.0	312.0	130.0

88	42	43	100.0	257.0	120.0
89	42	43	100.0	257.0	120.0
90	43	44	150.0	268.0	120.0
91	44	177	100.0	391.0	120.0
92	44	176	100.0	391.0	120.0
93	176	177	100.0	90.0	120.0
99	29	112	65.0	251.0	130.0
100	109	511	100.0	400.0	120.0
101	108	109	100.0	120.0	120.0
102	108	183	44.0	228.0	130.0
103	107	108	100.0	200.0	120.0
104	107	182	44.0	253.0	130.0
105	28	107	100.0	40.0	120.0
106	28	113	150.0	66.0	120.0
107	113	114	65.0	265.0	130.0
108	114	117	65.0	500.0	130.0
109	117	118	44.0	318.0	130.0
111	118	119	75.0	248.0	120.0
113	28	106	150.0	250.0	120.0
114	103	106	150.0	400.0	120.0
115	105	106	44.0	250.0	130.0
116	104	105	44.0	300.0	130.0
117	103	104	44.0	239.0	130.0
118	30	526	100.0	210.0	120.0
120	155	500	140.0	175.0	130.0
121	150	185	75.0	300.0	120.0
122	31	150	150.0	300.0	120.0
125	132	133	44.0	363.0	130.0
126	31	132	150.0	616.0	120.0
127	31	64	225.0	167.0	120.0
128	31	70	150.0	562.0	120.0
129	70	144	100.0	284.0	120.0
130	144	145	44.0	121.0	130.0
131	45	144	100.0	368.0	120.0
132	45	47	150.0	162.0	120.0
134	9	57	100.0	25.0	120.0
135	57	58	100.0	120.0	120.0
136	58	60	100.0	262.0	120.0
137	56	58	100.0	330.0	120.0
140	58	143	100.0	168.0	120.0
141	142	143	50.0	264.0	120.0
142	57	142	100.0	202.0	120.0
143	141	142	100.0	99.0	120.0
145	11	12	100.0	388.0	120.0
146	12	150	150.0	360.0	120.0
147	12	151	150.0	163.0	120.0
148	13	151	150.0	35.0	120.0
149	151	186	140.0	450.0	130.0
151	154	155	100.0	132.0	120.0
160	153	154	100.0	165.0	120.0
161	14	153	150.0	236.0	120.0
162	13	14	150.0	475.0	120.0
163	13	146	150.0	35.0	120.0
164	146	147	150.0	137.0	120.0
165	11	147	150.0	313.0	120.0
168	14	152	100.0	66.0	120.0
170	33	152	100.0	150.0	120.0
176	68	136	44.0	726.0	130.0
177	136	137	44.0	512.0	130.0
178	137	187	140.0	277.0	130.0
181	71	122	225.0	400.0	120.0
182	71	124	225.0	400.0	120.0
183	15	124	225.0	441.0	120.0
184	15	16	150.0	177.0	120.0
185	16	121	100.0	286.0	120.0
186	120	121	75.0	1,210.0	120.0
187	16	125	100.0	850.0	120.0
188	123	125	100.0	764.0	120.0
189	123	124	44.0	120.0	130.0
190	122	123	140.0	160.0	130.0
191	122	209	225.0	120.0	120.0
193	125	126	100.0	396.0	120.0
194	126	128	65.0	668.0	130.0
195	126	127	65.0	1,047.0	130.0
196	128	129	65.0	90.0	130.0

197	129	130	44.0	60.0	130.0
198	130	131	37.0	88.0	130.0
199	62	520	100.0	569.0	120.0
200	41	42	100.0	237.0	120.0
203	5	36	150.0	105.0	120.0
179	187	300	150.0	500.0	120.0
250	136	301	65.0	215.0	130.0
209	160	300	150.0	152.0	120.0
210	185	186	140.0	250.0	130.0
211	53	56	100.0	150.0	120.0
213	62	524	97.0	334.0	130.0
214	30	503	100.0	334.0	120.0
215	112	511	75.0	132.0	120.0
216	500	501	140.0	100.0	130.0
217	154	501	65.0	104.0	130.0
218	186	501	140.0	221.0	130.0
219	121	520	100.0	656.0	120.0
110	118	503	75.0	167.0	120.0
300	215	301	100.0	554.0	120.0
208	215	300	100.0	250.0	120.0
17	205	527	100.0	250.0	120.0
303	10	141	100.0	442.0	120.0
304	24	25	100.0	55.0	120.0
305	55	172	100.0	50.0	120.0
306	20	172	100.0	50.0	120.0
307	23	25	100.0	75.0	120.0
308	40	178	150.0	150.0	120.0
77	39	40	100.0	180.0	120.0
78	40	189	100.0	60.0	120.0
79	100	101	44.0	450.0	130.0
309	41	42	150.0	150.0	120.0
310	119	521	65.0	350.0	130.0
311	521	522	65.0	350.0	130.0
312	120	522	65.0	350.0	130.0
313	33	35	100.0	150.0	120.0
301	11	523	150.0	120.0	120.0
314	59	523	100.0	180.0	120.0
315	502	524	75.0	150.0	120.0
316	525	600	75.0	450.0	120.0
317	524	600	97.0	450.0	130.0
318	525	600	97.0	450.0	130.0
319	525	526	75.0	210.0	120.0
321	527	528	65.0	480.0	130.0
322	134	528	65.0	200.0	130.0
11	165	601	65.0	75.0	130.0
324	188	527	65.0	50.0	130.0
325	122	123	140.0	160.0	130.0
326	123	125	97.0	764.0	130.0
327	56	59	140.0	352.0	130.0
328	1	49	158.0	264.0	130.0
329	206	527	150.0	215.0	120.0
330	156	541	100.0	931.0	120.0
331	112	540	97.0	434.0	130.0
212	22	54	150.0	275.0	120.0
401	402	602	200.0	234.0	120.0
402	402	403	200.0	101.0	120.0
403	403	404	200.0	61.0	120.0
404	404	405	200.0	122.0	120.0
405	405	406	200.0	65.0	120.0
406	406	407	200.0	42.0	120.0
407	407	408	200.0	61.0	120.0
408	408	409	200.0	61.0	120.0
409	409	410	200.0	215.0	120.0
410	410	411	250.0	90.0	120.0
411	411	412	250.0	152.0	120.0
413	412	414	200.0	488.0	120.0
414	414	415	200.0	80.0	120.0
415	46	415	200.0	75.0	120.0

Net Work Analysis

Distribution Main A

Node No.	Elevation of Pipe (MSL)	Demand (cum/d)	Dynamic Pressure (MSL)	Dynamic Pressure (m)	Static Pressure (m)			Leakage (cum/d)
1	1,881.7	90.3	1,943.1	61.4	109.3	0.0	0.0	37.1
2	1,885.1	51.8	1,926.8	41.7	105.9	0.0	0.0	24.2
4	1,881.8	56.2	1,926.5	44.7	109.2	0.0	0.0	26.2
5	1,881.3	29.6	1,926.5	45.2	109.7	0.0	0.0	26.5
6	1,883.7	56.2	1,926.3	42.6	107.3	0.0	0.0	24.8
9	1,881.2	98.4	1,939.2	58.0	109.8	0.0	0.0	34.9
10	1,903.4	18.5	1,938.4	35.0	87.6	0.0	0.0	20.0
11	1,902.1	63.6	1,927.7	25.6	88.9	0.0	0.0	14.2
12	1,880.5	48.8	1,926.9	46.4	110.5	0.0	0.0	27.2
13	1,874.2	37.7	1,926.9	52.7	116.8	0.0	0.0	31.3
14	1,865.6	48.8	1,926.7	61.1	125.4	0.0	0.0	36.9
15	1,860.5	45.1	1,959.4	98.9	130.5	0.0	0.0	62.6
16	1,860.5	62.9	1,959.0	98.5	130.5	0.0	0.0	62.4
18	1,885.1	79.2	1,939.1	54.0	105.9	0.0	0.0	32.2
19	1,885.8	62.9	1,939.1	53.3	105.2	0.0	0.0	31.7
22	1,889.4	58.5	1,940.3	50.9	101.6	0.0	0.0	30.1
23	1,887.3	60.7	1,939.1	51.8	103.7	0.0	0.0	30.7
24	1,887.7	86.6	1,939.1	51.4	103.3	0.0	0.0	30.5
25	1,887.0	37.7	1,939.0	52.0	104.0	0.0	0.0	30.9
27	1,882.3	55.5	1,926.2	43.9	108.7	0.0	0.0	25.6
28	1,879.2	19.2	1,923.7	44.5	111.8	0.0	0.0	26.0
29	1,892.4	9.6	1,912.6	20.2	98.6	0.0	0.0	10.9
30	1,882.6	59.2	1,941.7	59.1	108.4	0.0	0.0	35.5
31	1,882.0	68.8	1,926.8	44.8	109.0	0.0	0.0	26.2
36	1,889.3	37.7	1,926.4	37.1	101.7	0.0	0.0	21.3
37	1,891.4	34.8	1,926.2	34.8	99.6	0.0	0.0	19.8
38	1,893.9	31.1	1,926.1	32.2	97.1	0.0	0.0	18.3
39	1,914.9	37.0	1,926.1	11.2	76.1	0.0	0.0	5.7
41	1,899.2	32.6	1,926.1	26.9	91.8	0.0	0.0	15.0
42	1,896.1	28.1	1,926.1	30.0	94.9	0.0	0.0	16.9
43	1,894.8	29.6	1,926.1	31.3	96.2	0.0	0.0	17.6
44	1,893.4	40.0	1,926.1	32.7	97.6	0.0	0.0	18.5
45	1,884.9	49.6	1,926.7	41.8	106.1	0.0	0.0	24.3
46	1,878.2	94.0	1,944.5	66.3	112.8	0.0	0.0	40.3
47	1,880.7	26.6	1,926.7	46.0	110.3	0.0	0.0	27.0
48	1,880.2	74.7	1,942.7	62.5	110.8	0.0	0.0	37.8
49	1,881.1	118.4	1,942.7	61.6	109.9	0.0	0.0	37.2
50	1,886.3	106.6	1,952.6	66.3	104.7	0.0	0.0	40.4
51	1,895.4	34.8	1,949.0	53.6	95.6	0.0	0.0	31.9
52	1,889.1	71.8	1,938.8	49.6	101.9	0.0	0.0	29.4
55	1,886.2	65.9	1,939.2	53.0	104.8	0.0	0.0	31.5
56	1,902.7	36.3	1,935.6	32.9	88.3	0.0	0.0	18.7
57	1,884.1	68.8	1,938.8	54.7	106.9	0.0	0.0	32.6
58	1,890.9	88.1	1,937.9	47.0	100.1	0.0	0.0	27.6
60	1,889.9	74.0	1,938.0	48.1	101.1	0.0	0.0	28.4
61	1,885.4	37.0	1,926.1	40.7	105.6	0.0	0.0	23.6
62	1,890.2	56.2	1,947.9	57.7	100.8	0.0	0.0	34.6
63	1,878.7	28.1	1,926.8	48.1	112.3	0.0	0.0	28.3
64	1,876.5	32.6	1,926.8	50.3	114.5	0.0	0.0	29.8
66	1,910.0	29.6	1,951.4	41.4	81.0	0.0	0.0	24.0
67	1,921.5	28.1	1,955.3	33.8	69.5	0.0	0.0	19.2
68	1,918.6	31.1	1,976.7	58.1	72.4	0.0	0.0	34.9
69	1,879.5	37.0	1,944.4	64.9	111.5	0.0	0.0	39.4
70	1,904.5	97.7	1,926.7	22.2	86.5	0.0	0.0	12.1
71	1,894.5	64.4	1,959.7	65.2	96.5	0.0	0.0	39.8
100	1,896.6	24.4	1,925.5	28.9	94.4	0.0	0.0	16.2
101	1,885.9	18.5	1,925.3	39.4	105.1	0.0	0.0	22.7
102	1,876.7	27.4	1,925.2	48.5	114.3	0.0	0.0	28.6
103	1,883.1	37.0	1,924.6	41.5	107.9	0.0	0.0	24.1
104	1,916.3	14.1	1,924.2	7.9	74.7	0.0	0.0	3.9
105	1,903.9	12.6	1,924.0	20.1	87.1	0.0	0.0	10.9
106	1,881.3	31.8	1,924.0	42.7	109.7	0.0	0.0	24.9
107	1,880.1	23.7	1,923.2	43.1	110.9	0.0	0.0	25.1
108	1,884.1	22.2	1,921.3	37.2	106.9	0.0	0.0	21.3
109	1,884.6	14.8	1,920.2	35.6	106.4	0.0	0.0	20.4
112	1,900.7	0.0	1,912.6	11.9	90.3	0.0	0.0	6.1
113	1,878.5	21.5	1,923.7	45.2	112.5	0.0	0.0	26.4
114	1,897.3	42.2	1,924.1	26.8	93.7	0.0	0.0	14.9
117	1,907.5	43.7	1,926.0	18.5	83.5	0.0	0.0	9.9
118	1,889.0	27.4	1,940.5	51.5	102.0	0.0	0.0	30.5
119	1,889.1	47.4	1,940.5	51.4	101.9	0.0	0.0	30.5
120	1,871.2	83.6	1,944.6	73.4	119.8	0.0	0.0	45.1
121	1,862.6	80.7	1,954.3	91.7	128.4	0.0	0.0	57.7
122	1,950.0	65.9	1,959.9	9.9	41.0	0.0	0.0	5.0
123	1,927.3	48.1	1,959.8	32.5	63.7	0.0	0.0	18.4
124	1,879.6	50.3	1,959.6	80.0	111.4	0.0	0.0	49.6
125	1,886.2	79.9	1,959.2	73.0	104.8	0.0	0.0	44.8

Net Work Analysis Distribution Main

Node No.	Elevation of Pipe (MSL)	Demand (cum/d)	Dynamic Pressure (MSL)	Dynamic Pressure (m)	Static Pressure (m)	A		Leakage (cum/d)
126	1,894.1	79.2	1,958.8	64.7	96.9	0.0	0.0	39.3
127	1,874.9	40.0	1,958.2	83.3	116.1	0.0	0.0	51.9
128	1,896.4	28.1	1,958.4	62.0	94.6	0.0	0.0	37.5
129	1,896.0	5.9	1,958.4	62.4	95.0	0.0	0.0	37.7
130	1,886.4	5.2	1,958.4	72.0	104.6	0.0	0.0	44.1
131	1,875.8	3.0	1,958.4	82.6	115.2	0.0	0.0	51.4
132	1,886.8	37.7	1,926.8	40.0	104.2	0.0	0.0	23.1
133	1,898.7	13.3	1,926.6	27.9	92.3	0.0	0.0	15.6
134	1,924.5	40.0	1,952.1	27.6	66.5	0.0	0.0	15.4
135	1,915.7	42.9	1,951.3	35.6	75.3	0.0	0.0	20.4
136	1,944.8	52.5	1,978.3	33.5	46.2	0.0	0.0	19.1
137	1,905.0	87.3	1,978.5	73.5	86.0	0.0	0.0	45.2
139	1,905.8	122.1	1,948.9	43.1	85.2	0.0	0.0	25.1
140	1,899.4	22.9	1,948.9	49.5	91.6	0.0	0.0	29.3
141	1,890.2	73.3	1,938.5	48.3	100.8	0.0	0.0	28.4
142	1,883.9	76.2	1,938.5	54.6	107.1	0.0	0.0	32.6
143	1,888.7	81.4	1,937.9	49.2	102.3	0.0	0.0	29.1
144	1,907.4	28.9	1,926.7	19.3	83.6	0.0	0.0	10.4
145	1,909.3	4.4	1,926.7	17.4	81.7	0.0	0.0	9.3
146	1,876.5	40.0	1,926.9	50.4	114.5	0.0	0.0	29.9
147	1,878.9	72.5	1,927.1	48.2	112.1	0.0	0.0	28.4
148	1,889.6	46.6	1,943.6	54.0	101.4	0.0	0.0	32.2
149	1,901.1	20.7	1,944.4	43.3	89.9	0.0	0.0	25.3
150	1,899.4	87.3	1,926.8	27.4	91.6	0.0	0.0	15.3
151	1,874.4	56.2	1,926.9	52.5	116.6	0.0	0.0	31.2
152	1,865.9	48.8	1,926.7	60.8	125.1	0.0	0.0	36.7
153	1,862.7	52.5	1,926.7	64.0	128.3	0.0	0.0	38.8
154	1,864.7	48.8	1,926.7	62.0	126.3	0.0	0.0	37.5
155	1,867.6	16.3	1,926.7	59.1	123.4	0.0	0.0	35.6
156	1,884.8	29.6	1,926.8	42.0	106.2	0.0	0.0	24.4
157	1,881.9	17.8	1,926.8	44.9	109.1	0.0	0.0	26.3
158	1,880.3	17.8	1,926.8	46.5	110.7	0.0	0.0	27.3
160	1,903.2	14.1	1,978.6	75.4	87.8	0.0	0.0	46.5
161	1,905.3	8.1	1,948.9	43.6	85.7	0.0.	0.0	25.5
162	1,891.8	28.1	1,949.0	57.2	99.2	0.0	0.0	34.3
163	1,899.3	5.2	1,949.0	49.7	91.7	0.0	0.0	29.4
164	1,919.8	3.0	1,952.1	32.3	71.2	0.0	0.0	18.3
165	1,962.5	74.7	1,990.9	28.4	28.5	0.0	0.0	15.9
166	1,899.0	13.3	1,926.7	27.7	92.0	0.0	0.0	15.4
169	1,917.8	16.3	1,926.5	8.7	73.2	0.0	0.0	4.3
170	1,893.3	9.6	1,926.7	33.4	97.7	0.0	0.0	19.0
171	1,909.7	14.1	1,943.5	33.8	81.3	0.0	0.0	19.2
21	1,885.1	71.8	1,939.3	54.2	105.9	0.0	0.0	32.3
20	1,885.9	61.4	1,939.2	53.3	105.1	0.0	0.0	31.8
174	1,902.4	77.0	1,938.8	36.4	88.6	0.0	0.0	20.9
53	1,895.7	71.8	1,937.7	42.0	95.3	0.0	0.0	24.4
176	1,895.0	17.0	1,926.1	31.1	96.0	0.0	0.0	17.5
177	1,897.3	17.0	1,926.1	28.8	93.7	0.0	0.0	16.1
178	1,912.8	40.7	1,926.0	13.2	78.2	0.0	0.0	6.8
179	1,917.5	18.5	1,926.2	8.7	73.5	0.0	0.0	4.3
181	1,881.0	59.2	1,925.4	44.4	110.0	0.0	0.0	26.0
182	1,891.9	9.6	1,923.2	31.3	99.1	0.0	0.0	17.6
183	1,899.2	8.9	1,921.2	22.0	91.8	0.0	0.0	12.0
185	1,902.8	48.8	1,926.8	24.0	88.2	0.0	0.0	13.2
186	1,885.4	48.8	1,926.8	41.4	105.6	0.0	0.0	24.0
187	1,903.2	56.2	1,978.6	75.3	87.8	0.0	0.0	46.4
188	1,931.7	5.9	1,956.1	24.4	59.3	0.0	0.0	13.4
189	1,921.8	21.5	1,925.7	3.9	69.2	0.0	0.0	1.8
300	1,903.6	34.8	1,978.6	75.0	87.4	0.0	0.0	46.2
301	1,951.4	56.2	1,978.7	27.3	39.6	0.0	0.0	15.2
402	1,955.5	0.0	1,956.1	0.6	35.5	0.0	0.0	0.2
403	1,954.4	0.0	1,955.3	0.9	36.6	0.0	0.0	0.4
404	1,953.8	0.0	1,954.8	1.0	37.2	0.0	0.0	0.4
405	1,952.5	0.0	1,953.8	1.3	38.5	0.0	0.0	0.6
406	1,951.8	0.0	1,953.3	1.5	39.2	0.0	0.0	0.6
407	1,951.3	0.0	1,953.0	1.7	39.7	0.0	0.0	0.7
408	1,950.7	0.0	1,952.5	1.8	40.3	0.0	0.0	0.8
409	1,950.0	0.0	1,952.0	2.0	41.0	0.0	0.0	0.9
410	1,947.8	0.0	1,950.3	2.5	43.2	0.0	0.0	1.1
411	1,947.4	0.0	1,950.0	2.6	43.6	0.0	0.0	1.2
412	1,946.9	0.0	1,949.6	2.7	44.1	0.0	0.0	1.2
414	1,941.7	0.0	1,945.7	4.0	49.3	0.0	0.0	1.8
415	1,940.8	0.0	1,945.1	4.3	50.2	0.0	0.0	2.0
59	1,900.0	90.3	1,933.5	33.5	91.0	0.0	0.0	19.1
500	1,892.8	18.5	1,926.7	33.9	98.2	0.0	0.0	19.3
501	1,886.6	56.2	1,926.7	40.1	104.4	0.0	0.0	23.2
502	1,885.6	59.2	1,946.7	61.1	105.4	0.0	0.0	36.9

Net Work Analysis Distribution Main A

Node No.	Elevation of Pipe (MSL)	Demand (cum/d)	Dynamic Pressure (MSL)	Dynamic Pressure (m)	Static Pressure (m)			Leakage (cum/d)
503	1,884.2	56.2	1,941.1	56.9	106.8	0.0	0.0	34.1
510	1,914.5	37.7	1,948.9	34.4	76.5	0.0	0.0	19.6
511	1,892.1	14.8	1,916.9	24.8	98.9	0.0	0.0	13.7
520	1,913.6	46.6	1,950.6	37.0	77.4	0.0	0.0	21.2
304	1,900.4	51.8	1,946.8	46.4	90.6	0.0	0.0	27.2
172	1,886.0	37.7,	1,939.2	53.2	105.0	0.0	0.0	31.7
173	1,916.0	37.7	1,925.1	9.1	75.0	0.0	0.0	4.5
521	1,886.0	37.7	1,941.1	55.1	105.0	0.0	0.0	32.9
522	1,880.0	37.7	1,942.4	62.4	111.0	0.0	0.0	37.7
523	1,903.0	37.7	1,928.2	25.2	88.0	0.0	0.0	13.9
524	1,887.0	37.7	1,946.8	59.8	104.0	0.0	0.0	36.0
525	1,881.0	37.7	1,945.1	64.1	110.0	0.0	0.0	38.9
526	1,882.0	37.7	1,942.2	60.2	109.0	0.0	0.0	36.3
527	1,931.0	22.2	1,958.0	27.0	60.0	0.0	0.0	15.0
528	1,943.0	22.2	1,953.5	10.5	48.0	0.0	0.0	5.3
33	1,867.0	37.7	1,926.7	59.6	124.0	0.0	0.0	35.9
35	1,870.0	45.1	1,926.6	56.6	121.0	0.0	0.0	33.9
40	1,920.0	29.6	1,925.9	5.9	71.0	0.0	0.0	2.8
54	1,886.0	37.7	1,939.4	53.4	105.0	0.0	0.0	31.8
540	1,930.0	486.9	1,935.3	5.3	61.0	0.0	0.0	2.5
541	1,980.0	669.7	1,985.0	5.0	11.0	0.0	0.0	2.3

Net Work Analysis

Distribution Main

Pipe No.	Node A	Node B	Length (m)	Diameter (mm)	C	Flow (cum/d)	Velocity (m/s)	Pressure Gradient (o/oo)	Loss (m)
1	139	510	800.00	225.00	120.00	37.00	0.00	0.00	0.00
2	139	304	374.00	44.00	130.00	51.00	0.40	5.70	2.10
3	139	140	162.00	150.00	120.00	-211.00	-0.10	-0.20	0.00
4	140	161	222.00	65.00	120.00	8.00	0.00	0.00	0.00
5	51	140	228.00	150.00	120.00	242.00	0.20	0.30	0.10
6	162	163	143.00	44.00	130.00	5.00	0.00	0.10	0.00
7	51	162	20.00	150.00	120.00	33.00	0.00	0.00	0.00
8	51	135	690.00	100.00	120.00	-310.00	-0.50	-3.30	-2.30
9	134	135	178.00	65.00	130.00	123.00	0.40	4.20	0.80
12	134	164	84.00	44.00	130.00	3.00	0.00	0.00	0.00
13	66	135	265.00	150.00	120.00	230.00	0.10	0.30	0.10
14	50	66	530.00	100.00	120.00	259.00	0.40	2.40	1.30
15	50	67	583.00	100.00	120.00	-366.00	-0.50	-4.50	-2.60
16	67	188	165.00	100.00	120.00	-394.00	-0.60	-5.20	-0.80
20	21	54	59.00	150.00	120.00	-655.00	-0.40	-1.80	-0.10
21	21	23	88.00	100.00	120.00	263.00	0.40	2.50	0.20
22	23	24	55.00	150.00	120.00	39.00	0.00	0.00	0.00
23	20	24	90.00	100.00	120.00	239.00	0.30	2.00	0.20
24	20	21	66.00	150.00	120.00	-319.00	-0.20	-0.50	0.00
25	25	174	569.00	100.00	120.00	77.00	0.10	0.30	0.10
26	25	52	110.00	100.00	120.00	240.00	0.30	2.10	0.20
27	52	53	176.00	100.00	120.00	429.00	0.60	6.00	1.10
28	53	60	100.00	100.00	120.00	-318.00	-0.50	-3.50	-0.30
29	18	60	134.00	100.00	120.00	503.00	0.70	8.10	1.10
30	18	19	54.00	150.00	120.00	211.00	0.10	0.20	0.00
31	19	52	151.00	100.00	120.00	260.00	0.40	2.40	0.40
32	19	55	133.00	100.00	120.00	-111.00	-0.20	-0.50	-0.10
33	54	172	100.00	100.00	120.00	195.00	0.30	1.40	0.10
34	9	18	315.00	225.00	120.00	794.00	0.20	0.40	0.10
35	9	48	47.00	100.00	120.00	-1,652.00	-2.40	-73.50	-3.50
36	1	48	265.00	225.00	120.00	1,683.00	0.50	1.50	0.40
37	48	49	201.00	100.00	120.00	-43.00	-0.10	-0.10	0.00
38	22	49	672.00	150.00	120.00	-946.00	-0.60	-3.60	-2.40
40	49	148	536.00	100.00	120.00	-210.00	-0.30	-1.60	-0.90
41	148	171	372.00	50.00	120.00	14.00	0.10	0.30	0.10
42	69	148	325.00	100.00	120.00	271.00	0.40	2.60	0.80
43	46	69	90.00	150.00	120.00	328.00	0.20	0.50	0.10
44	69	149	551.00	100.00	120.00	20.00	0.00	0.00	0.00
45	1	49	264.00	100.00	120.00	195.00	0.30	1.40	0.40
46	1	46	401.00	225.00	120.00	-2,672.00	-0.80	-3.50	-1.40
48	47	64	268.00	100.00	120.00	-79.00	-0.10	-0.30	-0.10
49	63	64	444.00	300.00	120.00	260.00	0.00	0.00	0.00
51	63	158	47.00	300.00	120.00	-288.00	-0.10	0.00	0.00
52	158	166	358.00	50.00	120.00	13.00	0.10	0.30	0.10
53	157	158	77.00	300.00	120.00	319.00	0.10	0.00	0.00
54	157	170	264.00	44.00	130.00	9.00	0.10	0.30	0.10
55	156	157	300.00	300.00	120.00	347.00	0.10	0.00	0.00
56	2	156	100.00	300.00	120.00	1,062.00	0.20	0.10	0.00
59	156	169	440.00	44.00	130.00	16.00	0.10	0.70	0.30
61	2	203	704.00	350.00	120.00	-2,189.00	-0.30	-0.30	-0.20
62	2	4	442.00	225.00	120.00	1,075.00	0.30	0.60	0.30
63	4	5	65.00	225.00	120.00	981.00	0.30	0.50	0.00
64	4	61	972.00	65.00	130.00	37.00	0.10	0.50	0.40
65	5	6	221.00	150.00	120.00	469.00	0.30	1.00	0.20
66	6	27	150.00	150.00	120.00	413.00	0.30	0.80	0.10
67	27	37	216.00	100.00	120.00	-20.00	0.00	0.00	0.00
68	36	37	400.00	150.00	120.00	343.00	0.20	0.60	0.20
69	36	38	563.00	100.00	120.00	101.00	0.10	0.40	0.20
70	37	38	30.00	150.00	120.00	288.00	0.20	0.40	0.00
71	38	178	452.00	150.00	120.00	275.00	0.20	0.40	0.20
72	27	181	1,106.00	150.00	120.00	378.00	0.30	0.70	0.70
73	38	39	300.00	150.00	120.00	82.00	0.10	0.00	0.00
74	39	173	320.00	44.00	130.00	37.00	0.30	3.10	1.00
75	181	189	400.00	150.00	120.00	-354.00	-0.20	-0.60	-0.20
76	102	181	92.00	150.00	120.00	-673.00	-0.40	-1.90	-0.20
80	39	179	125.00	150.00	120.00	-376.00	-0.30	-0.70	-0.10
81	39	41	100.00	150.00	120.00	213.00	0.10	0.20	0.00
82	179	208	104.00	65.00	130.00	-394.00	-1.40	-36.40	-3.80
83	102	103	350.00	150.00	120.00	652.00	0.40	1.80	0.60
84	101	102	120.00	44.00	130.00	6.00	0.10	0.10	0.00
86	41	100	120.00	44.00	130.00	49.00	0.40	5.20	0.60
87	100	101	312.00	37.00	130.00	10.00	0.10	0.70	0.20
88	42	43	257.00	100.00	120.00	51.00	0.10	0.10	0.00
89	42	43	257.00	100.00	120.00	51.00	0.10	0.10	0.00
90	43	44	268.00	150.00	120.00	74.00	0.10	0.00	0.00
91	44	177	391.00	100.00	120.00	17.00	0.00	0.00	0.00
92	44	176	391.00	100.00	120.00	17.00	0.00	0.00	0.00

Net Work Analysis

Distribution Main

Pipe No.	Node A	Node B	Length (m)	Diameter (mm)	C	Flow (cum/d)	Velocity (m/s)	Pressure Gradient (o/oo)	Loss (m)
93	176	177	90.00	100.00	120.00	0.00	0.00	0.00	0.00
99	29	112	251.00	65.00	130.00	-9.00	0.00	0.00	0.00
100	109	511	400.00	100.00	120.00	511.00	0.80	8.40	3.40
101	108	109	120.00	100.00	120.00	526.00	0.80	8.80	1.10
102	108	183	228.00	44.00	130.00	8.00	0.10	0.20	0.10
103	107	108	200.00	100.00	120.00	557.00	0.80	9.80	2.00
104	107	182	253.00	44.00	130.00	9.00	0.10	0.30	0.10
105	28	107	40.00	100.00	120.00	590.00	0.90	10.90	0.40
106	28	113	66.00	150.00	120.00	-52.00	0.00	0.00	0.00
107	113	114	265.00	65.00	130.00	-73.00	-0.30	-1.60	-0.40
108	114	117	500.00	65.00	130.00	-116.00	-0.40	-3.80	-1.90
109	117	118	318.00	44.00	130.00	-159.00	-1.20	-45.60	-14.50
111	118	119	248.00	75.00	120.00	-28.00	-0.10	-0.20	0.00
113	28	106	250.00	150.00	120.00	-557.00	-0.40	-1.40	-0.30
114	103	106	400.00	150.00	120.00	587.00	0.40	1.50	0.60
115	105	106	250.00	44.00	130.00	1.00	0.00	0.00	0.00
116	104	105	300.00	44.00	130.00	14.00	0.10	0.50	0.20
117	103	104	239.00	44.00	130.00	28.00	0.20	1.90	0.40
118	30	526	210.00	100.00	120.00	-273.00	-0.40	-2.60	-0.60
120	155	500	175.00	140.00	130.00	-37.00	0.00	0.00	0.00
121	150	185	300.00	75.00	120.00	22.00	0.10	0.10	0.00
122	31	150	300.00	150.00	120.00	-99.00	-0.10	-0.10	0.00
125	132	133	363.00	44.00	130.00	13.00	0.10	0.50	0.20
126	31	132	616.00	150.00	120.00	51.00	0.00	0.00	0.00
127	31	64	167.00	225.00	120.00	-148.00	0.00	0.00	0.00
128	31	70	662.00	150.00	120.00	127.00	0.10	0.10	0.10
129	70	144	284.00	100.00	120.00	30.00	0.00	0.00	0.00
130	144	145	121.00	44.00	130.00	4.00	0.00	0.10	0.00
131	45	144	368.00	100.00	120.00	3.00	0.00	0.00	0.00
132	45	47	162.00	150.00	120.00	-52.00	0.00	0.00	0.00
134	9	57	25.00	100.00	120.00	759.00	1.10	17.40	0.40
135	57	58	120.00	100.00	120.00	482.00	0.70	7.50	0.90
136	58	60	262.00	100.00	120.00	-111.00	-0.20	-0.50	-0.10
137	56	58	330.00	100.00	120.00	-465.00	-0.70	-7.00	-2.30
140	58	143	168.00	100.00	120.00	40.00	0.10	0.10	0.00
141	142	143	264.00	50.00	120.00	40.00	0.20	2.20	0.60
142	57	142	202.00	100.00	120.00	208.00	0.30	1.60	0.30
143	141	142	99.00	100.00	120.00	-91.00	-0.10	-0.30	0.00
145	11	12	388.00	100.00	120.00	248.00	0.40	2.20	0.90
146	12	150	360.00	150.00	120.00	209.00	0.10	0.20	0.10
147	12	151	163.00	150.00	120.00	-9.00	0.00	0.00	0.00
148	13	151	35.00	150.00	120.00	265.00	0.20	0.30	0.00
149	151	186	450.00	140.00	130.00	199.00	0.10	0.30	0.10
151	154	155	132.00	100.00	120.00	-20.00	0.00	0.00	0.00
160	153	154	165.00	100.00	120.00	14.00	0.00	0.00	0.00
161	14	153	236.00	150.00	120.00	67.00	0.00	0.00	0.00
162	13	14	475.00	150.00	120.00	247.00	0.20	0.30	0.10
163	13	146	35.00	150.00	120.00	-551.00	-0.40	-1.30	-0.10
164	146	147	137.00	150.00	120.00	-591.00	-0.40	-1.50	-0.20
165	11	147	313.00	150.00	120.00	663.00	0.40	1.90	0.60
168	14	152	66.00	100.00	120.00	131.00	0.20	0.70	0.00
170	33	152	150.00	100.00	120.00	-82.00	-0.10	-0.30	0.00
176	68	136	726.00	44.00	130.00	-31.00	-0.20	-2.20	-1.60
177	136	137	512.00	44.00	130.00	-12.00	-0.10	-0.40	-0.20
178	137	187	277.00	140.00	130.00	-99.00	-0.10	-0.10	0.00
181	71	122	400.00	225.00	120.00	-860.00	-0.30	-0.40	-0.20
182	71	124	400.00	225.00	120.00	796.00	0.20	0.40	0.10
183	15	124	441.00	225.00	120.00	-778.00	-0.20	-0.30	-0.10
184	15	16	177.00	150.00	120.00	733.00	0.50	2.30	0.40
185	16	121	286.00	100.00	120.00	734.00	1.10	16.40	4.70
186	120	121	1,210.00	75.00	120.00	-235.00	-0.60	-8.10	-9.80
187	16	125	850.00	100.00	120.00	-64.00	-0.10	-0.20	-0.10
188	123	125	764.00	100.00	120.00	152.00	0.20	0.90	0.70
189	123	124	120.00	44.00	130.00	32.00	0.20	2.30	0.30
190	122	123	160.00	140.00	130.00	192.00	0.10	0.20	0.00
191	122	209	120.00	225.00	120.00	-1,312.00	-0.40	-0.90	-0.10
193	125	126	396.00	100.00	120.00	161.00	0.20	1.00	0.40
194	126	128	668.00	65.00	130.00	42.00	0.10	0.60	0.40
195	126	127	1,047.00	65.00	130.00	40.00	0.10	0.50	0.60
196	128	129	90.00	65.00	130.00	14.00	0.10	0.10	0.00
197	129	130	60.00	44.00	130.00	8.00	0.10	0.20	0.00
198	130	131	88.00	37.00	130.00	3.00	0.00	0.10	0.00
199	62	520	569.00	100.00	120.00	-371.00	-0.60	-4.60	-2.60
200	41	42	237.00	100.00	120.00	27.00	0.00	0.00	0.00
203	5	36	105.00	150.00	120.00	482.00	0.30	1.00	0.10
179	187	300	500.00	150.00	120.00	-156.00	-0.10	-0.10	-0.10
250	136	301	215.00	65.00	130.00	-71.00	-0.30	-1.50	-0.30

Net Work Analysis

Distribution Main

Pipe No.	Node A	Node B	Length (m)	Diameter (mm)	C	Flow (cum/d)	Velocity (m/s)	Pressure Gradient (o/oo)	Loss (m)
209	160	300	152.00	150.00	120.00	-14.00	0.00	0.00	0.00
210	185	186	250.00	140.00	130.00	-26.00	0.00	0.00	0.00
211	53	56	150.00	100.00	120.00	675.00	1.00	14.00	2.10
213	62	524	334.00	97.00	130.00	315.00	0.50	3.40	1.10
214	30	503	334.00	100.00	120.00	214.00	0.30	1.70	0.60
215	112	511	132.00	75.00	120.00	-496.00	-1.30	-32.20	-4.30
216	500	501	100.00	140.00	130.00	-55.00	0.00	0.00	0.00
217	154	501	104.00	65.00	130.00	-13.00	-0.10	-0.10	0.00
218	186	501	221.00	140.00	130.00	125.00	0.10	0.10	0.00
219	121	520	656.00	100.00	120.00	418.00	0.60	5.80	3.80
110	118	503	167.00	75.00	120.00	-158.00	-0.40	-3.90	-0.70
300	215	301	554.00	100.00	120.00	127.00	0.20	0.60	0.30
208	215	300	250.00	100.00	120.00	205.00	0.30	1.50	0.40
17	205	527	250.00	100.00	120.00	501.00	0.70	8.10	2.00
303	10	141	442.00	100.00	120.00	-18.00	0.00	0.00	0.00
304	24	25	55.00	100.00	120.00	192.00	0.30	1.40	0.10
305	55	172	50.00	100.00	120.00	-177.00	-0.30	-1.20	-0.10
306	20	172	50.00	100.00	120.00	19.00	0.00	0.00	0.00
307	23	25	75.00	100.00	120.00	163.00	0.20	1.00	0.10
308	40	178	150.00	150.00	120.00	-235.00	-0.10	-0.30	0.00
77	39	40	180.00	100.00	120.00	170.00	0.30	1.10	0.20
78	40	189	60.00	100.00	120.00	375.00	0.60	4.70	0.30

Net Work Analysis   Distribution Main

File Name   NuwaExistYear2015   B
Season   All
Network Type   Existing

Demand   Year 2015
    Hourly Max
Reserver   Water Level Fix   All
    Discharge Fix   None

Magnification of Demand   1.622

Reservoir Data

Node		HWL (MSL)	LWL (MSL)	Reservoir
203	1	1,927.0	1,927.0	Haddon Hill
205	1	1,960.0	1,960.0	New Water Field
206	1	1,958.0	1,958.0	Old Water Field
208	1	1,930.0	1,930.0	Bonavista
209	1	1,960.0	1,960.0	Lovers Leap
215	1	1,979.0	1,979.0	Gamunu/Brewery
600	1	1,946.0	1,946.0	Naseby
601	1	1,991.0	1,991.0	Piyatissapura
602	1	1,958.0	1,958.0	Pedro Intake

Node Data

Node		Ground Elev (MSL)	Demand (cum/d)		
1	1	1,881.7	122.0	0	0
2	1	1,885.1	70.0	0	0
4	1	1,881.8	76.0	0	0
5	1	1,881.3	40.0	0	0
6	1	1,883.7	76.0	0	0
9	1	1,881.2	133.0	0	0
10	1	1,903.4	25.0	0	0
11	1	1,902.1	86.0	0	0
12	1	1,880.5	66.0	0	0
13	1	1,874.2	51.0	0	0
14	1	1,865.6	66.0	0	0
15	1	1,860.5	61.0	0	0
16	1	1,860.5	85.0	0	0
18	1	1,885.1	107.0	0	0
19	1	1,885.8	85.0	0	0
22	1	1,889.4	79.0	0	0
23	1	1,887.3	82.0	0	0
24	1	1,887.7	117.0	0	0
25	1	1,887.0	51.0	0	0
27	1	1,882.3	75.0	0	0
28	1	1,879.2	26.0	0	0
29	1	1,892.4	13.0	0	0
30	1	1,882.6	80.0	0	0
31	1	1,882.0	93.0	0	0
36	1	1,889.3	51.0	0	0
37	1	1,891.4	47.0	0	0
38	1	1,893.9	42.0	0	0
39	1	1,914.9	50.0	0	0
41	1	1,899.2	44.0	0	0
42	1	1,896.1	38.0	0	0
43	1	1,894.8	40.0	0	0
44	1	1,893.4	54.0	0	0
45	1	1,884.9	67.0	0	0
46	1	1,878.2	127.0	0	0
47	1	1,880.7	36.0	0	0
48	1	1,880.2	101.0	0	0
49	1	1,881.1	160.0	0	0
50	1	1,886.3	144.0	0	0
51	1	1,895.4	47.0	0	0
52	1	1,889.1	97.0	0	0
55	1	1,886.2	89.0	0	0
56	1	1,902.7	49.0	0	0
57	1	1,884.1	93.0	0	0
58	1	1,890.9	119.0	0	0
60	1	1,889.9	100.0	0	0

61	1	1,885.4	50.0	0	0
62	1	1,890.2	76.0	0	0
63	1	1,878.7	38.0	0	0
64	1	1,876.5	44.0	0	0
66	1	1,910.0	40.0	0	0
67	1	1,921.5	38.0	0	0
68	1	1,918.6	42.0	0	0
69	1	1,879.5	50.0	0	0
70	1	1,904.5	132.0	0	0
71	1	1,894.5	87.0	0	0
100	1	1,896.6	33.0	0	0
101	1	1,885.9	25.0	0	0
102	1	1,876.7	37.0	0	0
103	1	1,883.1	50.0	0	0
104	1	1,916.3	19.0	0	0
105	1	1,903.9	17.0	0	0
106	1	1,881.3	43.0	0	0
107	1	1,880.1	32.0	0	0
108	1	1,884.1	30.0	0	0
109	1	1,884.6	20.0	0	0
112	1	1,900.7	0.0	0	0
113	1	1,878.5	29.0	0	0
114	1	1,897.3	57.0	0	0
117	1	1,907.5	59.0	0	0
118	1	1,889.0	37.0	0	0
119	1	1,889.1	64.0	0	0
120	1	1,871.2	113.0	0	0
121	1	1,862.6	109.0	0	0
122	1	1,950.0	89.0	0	0
123	1	1,927.3	65.0	0	0
124	1	1,879.6	68.0	0	0
125	1	1,886.2	108.0	0	0
126	1	1,894.1	107.0	0	0
127	1	1,874.9	54.0	0	0
128	1	1,896.4	38.0	0	0
129	1	1,896.0	8.0	0	0
130	1	1,886.4	7.0	0	0
131	1	1,875.8	4.0	0	0
132	1	1,886.8	51.0	0	0
133	1	1,898.7	18.0	0	0
134	1	1,924.5	54.0	0	0
135	1	1,915.7	58.0	0	0
136	1	1,944.8	71.0	0	0
137	1	1,905.0	118.0	0	0
139	1	1,905.8	165.0	0	0
140	1	1,899.4	31.0	0	0
141	1	1,890.2	99.0	0	0
142	1	1,883.9	103.0	0	0
143	1	1,888.7	110.0	0	0
144	1	1,907.4	39.0	0	0
145	1	1,909.3	6.0	0	0
146	1	1,876.5	54.0	0	0
147	1	1,878.9	98.0	0	0
148	1	1,889.6	63.0	0	0
149	1	1,901.1	28.0	0	0
150	1	1,899.4	118.0	0	0
151	1	1,874.4	76.0	0	0
152	1	1,865.9	66.0	0	0
153	1	1,862.7	71.0	0	0
154	1	1,864.7	66.0	0	0
155	1	1,867.6	22.0	0	0
156	1	1,884.8	40.0	0	0
157	1	1,881.9	24.0	0	0
158	1	1,880.3	24.0	0	0
160	1	1,903.2	19.0	0	0
161	1	1,905.3	11.0	0	0
162	1	1,891.8	38.0	0	0
163	1	1,899.3	7.0	0	0
164	1	1,919.8	4.0	0	0
165	1	1,962.5	101.0	0	0
166	1	1,899.0	18.0	0	0
169	1	1,917.8	22.0	0	0
170	1	1,893.3	13.0	0	0
171	1	1,909.7	19.0	0	0
21	1	1,885.1	97.0	0	0

20	1	1,885.9	83.0	0	0
174	1	1,902.4	104.0	0	0
53	1	1,895.7	97.0	0	0
176	1	1,895.0	23.0	0	0
177	1	1,897.3	23.0	0	0
178	1	1,912.8	55.0	0	0
179	1	1,917.5	25.0	0	0
181	1	1,881.0	80.0	0	0
182	1	1,891.9	13.0	0	0
183	1	1,899.2	12.0	0	0
185	1	1,902.8	66.0	0	0
186	1	1,885.4	66.0	0	0
187	1	1,903.2	76.0	0	0
188	1	1,931.7	8.0	0	0
189	1	1,921.8	29.0	0	0
300	1	1,903.6	47.0	0	0
301	1	1,951.4	76.0	0	0
402	1	1,955.5	0.0	0	0
403	1	1,954.4	0.0	0	0
404	1	1,953.8	0.0	0	0
405	1	1,952.5	0.0	0	0
406	1	1,951.8	0.0	0	0
407	1	1,951.3	0.0	0	0
408	1	1,950.7	0.0	0	0
409	1	1,950.0	0.0	0	0
410	1	1,947.8	0.0	0	0
411	1	1,947.4	0.0	0	0
412	1	1,946.9	0.0	0	0
414	1	1,941.7	0.0	0	0
415	1	1,940.8	0.0	0	0
59	1	1,900.0	122.0	0	0
500	1	1,892.8	25.0	0	0
501	1	1,886.6	76.0	0	0
502	1	1,885.6	80.0	0	0
503	1	1,884.2	76.0	0	0
510	1	1,914.5	51.0	0	0
511	1	1,892.1	20.0	0	0
520	1	1,913.6	63.0	0	0
304	1	1,900.4	70.0	0	0
172	1	1,886.0	51.0	0	0
173	1	1,916.0	51.0	0	0
521	1	1,886.0	51.0	0	0
522	1	1,880.0	51.0	0	0
523	1	1,903.0	51.0	0	0
524	1	1,887.0	51.0	0	0
525	1	1,881.0	51.0	0	0
526	1	1,882.0	51.0	0	0
527	1	1,931.0	30.0	0	0
528	1	1,943.0	30.0	0	0
33	1	1,867.0	51.0	0	0
35	1	1,870.0	61.0	0	0
40	1	1,920.0	40.0	0	0
54	1	1,886.0	51.0	0	0
540	1	1,930.0	406.0	0	0
541	1	1,980.0	558.0	0	0

Booster Pump Data

No.	Type	Node A	Node B	Pipe No.	Pressure (m)
1	B	156	541	330	82.0
2	B	112	540	331	47.0

Pipe Data

Pipe No.	Node A	Node B	Diameter (mm)	Length (m)	C Value
1	139	510	225.0	800.0	120.0
2	139	304	44.0	374.0	130.0
3	139	140	150.0	162.0	120.0
4	140	161	65.0	222.0	120.0
5	51	140	150.0	228.0	120.0
6	162	163	44.0	143.0	130.0
7	51	162	150.0	20.0	120.0
8	51	135	100.0	690.0	120.0
9	134	135	65.0	178.0	130.0
12	134	164	44.0	84.0	130.0
13	66	135	150.0	265.0	120.0
14	50	66	100.0	530.0	120.0
15	50	67	100.0	583.0	120.0
16	67	188	100.0	165.0	120.0
20	21	54	150.0	59.0	120.0
21	21	23	100.0	88.0	120.0
22	23	24	150.0	55.0	120.0
23	20	24	100.0	90.0	120.0
24	20	21	150.0	66.0	120.0
25	25	174	100.0	569.0	120.0
26	25	52	100.0	110.0	120.0
27	52	53	100.0	176.0	120.0
28	53	60	100.0	100.0	120.0
29	18	60	100.0	134.0	120.0
30	18	19	150.0	54.0	120.0
31	19	52	100.0	151.0	120.0
32	19	55	100.0	133.0	120.0
33	54	172	100.0	100.0	120.0
34	9	18	225.0	315.0	120.0
35	9	48	100.0	47.0	120.0
36	1	48	225.0	265.0	120.0
37	48	49	100.0	201.0	120.0
38	22	49	150.0	672.0	120.0
40	49	148	100.0	536.0	120.0
41	148	171	50.0	372.0	120.0
42	69	148	100.0	325.0	120.0
43	46	69	150.0	90.0	120.0
44	69	149	100.0	551.0	120.0
45	1	49	100.0	264.0	120.0
46	1	46	225.0	401.0	120.0
48	47	64	100.0	268.0	120.0
49	63	64	300.0	444.0	120.0
51	63	158	300.0	47.0	120.0
52	158	166	50.0	358.0	120.0
53	157	158	300.0	77.0	120.0
54	157	170	44.0	264.0	130.0
55	156	157	300.0	300.0	120.0
56	2	156	300.0	100.0	120.0
59	156	169	44.0	440.0	130.0
61	2	203	350.0	704.0	120.0
62	2	4	225.0	442.0	120.0
63	4	5	225.0	65.0	120.0
64	4	61	65.0	972.0	130.0
65	5	6	150.0	221.0	120.0
66	6	27	150.0	150.0	120.0
67	27	37	100.0	216.0	120.0
68	36	37	150.0	400.0	120.0
69	36	38	100.0	563.0	120.0
70	37	38	150.0	30.0	120.0
71	38	178	150.0	452.0	120.0
72	27	181	150.0	1,106.0	120.0
73	38	39	150.0	300.0	120.0
74	39	173	44.0	320.0	130.0
75	181	189	150.0	400.0	120.0
76	102	181	150.0	92.0	120.0
80	39	179	150.0	125.0	120.0
81	39	41	150.0	100.0	120.0
82	179	208	65.0	104.0	130.0
83	102	103	150.0	350.0	120.0
84	101	102	44.0	120.0	130.0
86	41	100	44.0	120.0	130.0
87	100	101	37.0	312.0	130.0

88	42	43	100.0	257.0	120.0
89	42	43	100.0	257.0	120.0
90	43	44	150.0	268.0	120.0
91	44	177	100.0	391.0	120.0
92	44	176	100.0	391.0	120.0
93	176	177	100.0	90.0	120.0
99	29	112	65.0	251.0	130.0
100	109	511	100.0	400.0	120.0
101	108	109	100.0	120.0	120.0
102	108	183	44.0	228.0	130.0
103	107	108	100.0	200.0	120.0
104	107	182	44.0	253.0	130.0
105	28	107	100.0	40.0	120.0
106	28	113	150.0	66.0	120.0
107	113	114	65.0	265.0	130.0
108	114	117	65.0	500.0	130.0
109	117	118	44.0	318.0	130.0
111	118	119	75.0	248.0	120.0
113	28	106	150.0	250.0	120.0
114	103	106	150.0	400.0	120.0
115	105	106	44.0	250.0	130.0
116	104	105	44.0	300.0	130.0
117	103	104	44.0	239.0	130.0
118	30	526	100.0	210.0	120.0
120	155	500	140.0	175.0	130.0
121	150	185	75.0	300.0	120.0
122	31	150	150.0	300.0	120.0
125	132	133	44.0	363.0	130.0
126	31	132	150.0	616.0	120.0
127	31	64	225.0	167.0	120.0
128	31	70	150.0	662.0	120.0
129	70	144	100.0	284.0	120.0
130	144	145	44.0	121.0	130.0
131	45	144	100.0	368.0	120.0
132	45	47	150.0	162.0	120.0
134	9	57	100.0	25.0	120.0
135	57	58	100.0	120.0	120.0
136	58	60	100.0	262.0	120.0
137	56	58	100.0	330.0	120.0
140	58	143	100.0	168.0	120.0
141	142	143	50.0	264.0	120.0
142	57	142	100.0	202.0	120.0
143	141	142	100.0	99.0	120.0
145	11	12	100.0	388.0	120.0
146	12	150	150.0	360.0	120.0
147	12	151	150.0	163.0	120.0
148	13	151	150.0	35.0	120.0
149	151	186	140.0	450.0	130.0
151	154	155	100.0	132.0	120.0
160	153	154	100.0	165.0	120.0
161	14	153	150.0	236.0	120.0
162	13	14	150.0	475.0	120.0
163	13	146	150.0	35.0	120.0
164	146	147	150.0	137.0	120.0
165	11	147	150.0	313.0	120.0
168	14	152	100.0	66.0	120.0
170	33	152	100.0	150.0	120.0
176	68	136	44.0	726.0	130.0
177	136	137	44.0	512.0	130.0
178	137	187	140.0	277.0	130.0
181	71	122	225.0	400.0	120.0
182	71	124	225.0	400.0	120.0
183	15	124	225.0	441.0	120.0
184	15	16	150.0	177.0	120.0
185	16	121	100.0	286.0	120.0
186	120	121	75.0	1,210.0	120.0
187	16	125	100.0	850.0	120.0
188	123	125	100.0	764.0	120.0
189	123	124	44.0	120.0	130.0
190	122	123	140.0	160.0	130.0
191	122	209	225.0	120.0	120.0
193	125	126	100.0	396.0	120.0
194	126	128	65.0	668.0	130.0
195	126	127	65.0	1,047.0	130.0
196	128	129	65.0	90.0	130.0

197	129	130	44.0	60.0	130.0
198	130	131	37.0	88.0	130.0
199	62	520	100.0	569.0	120.0
200	41	42	100.0	237.0	120.0
203	5	36	150.0	105.0	120.0
179	187	300	150.0	500.0	120.0
250	136	301	65.0	215.0	130.0
209	160	300	150.0	152.0	120.0
210	185	186	140.0	250.0	130.0
211	53	56	100.0	150.0	120.0
213	62	524	97.0	334.0	130.0
214	30	503	100.0	334.0	120.0
215	112	511	75.0	132.0	120.0
216	500	501	140.0	100.0	130.0
217	154	501	65.0	104.0	130.0
218	186	501	140.0	221.0	130.0
219	121	520	100.0	656.0	120.0
110	118	503	75.0	167.0	120.0
300	215	301	100.0	554.0	120.0
208	215	300	100.0	250.0	120.0
17	205	527	100.0	250.0	120.0
303	10	141	100.0	442.0	120.0
304	24	25	100.0	55.0	120.0
305	55	172	100.0	50.0	120.0
306	20	172	100.0	50.0	120.0
307	23	25	100.0	75.0	120.0
308	40	178	150.0	150.0	120.0
77	39	40	100.0	180.0	120.0
78	40	189	100.0	60.0	120.0
79	100	101	44.0	450.0	130.0
309	41	42	150.0	150.0	120.0
310	119	521	65.0	350.0	130.0
311	521	522	65.0	350.0	130.0
312	120	522	65.0	350.0	130.0
313	33	35	100.0	150.0	120.0
301	11	523	150.0	120.0	120.0
314	59	523	100.0	180.0	120.0
315	502	524	75.0	150.0	120.0
316	525	600	75.0	450.0	120.0
317	524	600	97.0	450.0	130.0
318	525	600	97.0	450.0	130.0
319	525	526	75.0	210.0	120.0
321	527	528	65.0	480.0	130.0
322	134	528	65.0	200.0	130.0
11	165	601	65.0	75.0	130.0
324	188	527	65.0	50.0	130.0
325	122	123	140.0	160.0	130.0
326	123	125	97.0	764.0	130.0
327	56	59	140.0	352.0	130.0
328	1	49	158.0	264.0	130.0
329	206	527	150.0	215.0	120.0
330	156	541	100.0	931.0	120.0
331	112	540	97.0	434.0	130.0
212	22	54	150.0	275.0	120.0
401	402	602	200.0	234.0	120.0
402	402	403	200.0	101.0	120.0
403	403	404	200.0	61.0	120.0
404	404	405	200.0	122.0	120.0
405	405	406	200.0	65.0	120.0
406	406	407	200.0	42.0	120.0
407	407	408	200.0	61.0	120.0
408	408	409	200.0	61.0	120.0
409	409	410	200.0	215.0	120.0
410	410	411	250.0	90.0	120.0
411	411	412	250.0	152.0	120.0
413	412	414	200.0	488.0	120.0
414	414	415	200.0	80.0	120.0
415	46	415	200.0	75.0	120.0

Net Work Analysis   Distribution Main

Node No.	Elevation of Pipe (MSL)	Demand (cum/d)	Dynamic Pressure (MSL)	Dynamic Pressure (m)	Static Pressure (m)	B		Leakage (cum/d)
1	1,881.7	197.6	1,925.9	44.2	109.3	0.0	0.0	
2	1,885.1	113.4	1,925.6	40.5	105.9	0.0	0.0	
4	1,881.8	123.1	1,924.3	42.5	109.2	0.0	0.0	
5	1,881.3	64.8	1,924.1	42.8	109.7	0.0	0.0	
6	1,883.7	123.1	1,923.1	39.4	107.3	0.0	0.0	
9	1,881.2	215.5	1,918.9	37.7	109.8	0.0	0.0	
10	1,903.4	40.5	1,917.2	13.8	87.6	0.0	0.0	
11	1,902.1	139.3	1,917.0	14.9	88.9	0.0	0.0	
12	1,880.5	106.9	1,917.7	37.2	110.5	0.0	0.0	
13	1,874.2	82.6	1,917.0	42.8	116.8	0.0	0.0	
14	1,865.6	106.9	1,916.5	50.9	125.4	0.0	0.0	
15	1,860.5	98.8	1,958.7	98.2	130.5	0.0	0.0	
16	1,860.5	137.7	1,957.9	97.4	130.5	0.0	0.0	
18	1,885.1	173.3	1,918.7	33.6	105.9	0.0	0.0	
19	1,885.8	137.7	1,918.6	32.8	105.2	0.0	0.0	
22	1,889.4	128.0	1,920.4	31.0	101.6	0.0	0.0	
23	1,887.3	132.8	1,918.3	31.0	103.7	0.0	0.0	
24	1,887.7	189.5	1,918.3	30.6	103.3	0.0	0.0	
25	1,887.0	82.6	1,918.2	31.2	104.0	0.0	0.0	
27	1,882.3	121.5	1,922.6	40.3	108.7	0.0	0.0	
28	1,879.2	42.1	1,914.4	35.2	111.8	0.0	0.0	
29	1,892.4	21.1	1,893.8	1.4	98.6	0.0	0.0	
30	1,882.6	129.6	1,930.1	47.5	108.4	0.0	0.0	
31	1,882.0	150.7	1,924.2	42.2	109.0	0.0	0.0	
36	1,889.3	82.6	1,923.6	34.3	101.7	0.0	0.0	
37	1,891.4	76.1	1,922.6	31.2	99.6	0.0	0.0	
38	1,893.9	68.0	1,922.5	28.6	97.1	0.0	0.0	
39	1,914.9	81.0	1,922.3	7.4	76.1	0.0	0.0	
41	1,899.2	71.3	1,922.2	23.0	91.8	0.0	0.0	
42	1,896.1	61.6	1,922.1	26.0	94.9	0.0	0.0	
43	1,894.8	64.8	1,922.0	27.2	96.2	0.0	0.0	
44	1,893.4	87.5	1,922.0	28.6	97.6	0.0	0.0	
45	1,884.9	108.5	1,924.1	39.2	106.1	0.0	0.0	
46	1,878.2	205.7	1,928.7	50.5	112.8	0.0	0.0	
47	1,880.7	58.3	1,924.1	43.4	110.3	0.0	0.0	
48	1,880.2	163.6	1,925.1	44.9	110.8	0.0	0.0	
49	1,881.1	259.2	1,925.1	44.0	109.9	0.0	0.0	
50	1,886.3	233.3	1,934.6	48.3	104.7	0.0	0.0	
51	1,895.4	76.1	1,919.2	23.8	95.6	0.0	0.0	
52	1,889.1	157.1	1,918.1	29.0	101.9	0.0	0.0	
55	1,886.2	144.2	1,918.6	32.4	104.8	0.0	0.0	
56	1,902.7	79.4	1,917.4	14.7	88.3	0.0	0.0	
57	1,884.1	150.7	1,918.3	34.2	106.9	0.0	0.0	
58	1,890.9	192.8	1,917.7	26.8	100.1	0.0	0.0	
60	1,889.9	162.0	1,917.8	27.9	101.1	0.0	0.0	
61	1,885.4	81.0	1,922.4	37.0	105.6	0.0	0.0	
62	1,890.2	123.1	1,946.2	56.0	100.8	0.0	0.0	
63	1,878.7	61.6	1,925.0	46.3	112.3	0.0	0.0	
64	1,876.5	71.3	1,924.6	48.1	114.5	0.0	0.0	
66	1,910.0	64.8	1,929.2	19.2	81.0	0.0	0.0	
67	1,921.5	61.6	1,945.8	24.4	69.5	0.0	0.0	
68	1,918.6	68.0	1,969.3	50.7	72.4	0.0	0.0	
69	1,879.5	81.0	1,928.6	49.1	111.5	0.0	0.0	
70	1,904.5	213.8	1,924.0	19.5	86.5	0.0	0.0	
71	1,894.5	140.9	1,959.3	64.8	96.5	0.0	0.0	
100	1,896.6	53.5	1,920.0	23.4	94.4	0.0	0.0	
101	1,885.9	40.5	1,919.4	33.5	105.1	0.0	0.0	
102	1,876.7	59.9	1,919.4	42.7	114.3	0.0	0.0	
103	1,883.1	81.0	1,917.3	34.3	107.9	0.0	0.0	
104	1,916.3	30.8	1,915.8	-0.5	74.7	0.0	0.0	
105	1,903.9	27.5	1,915.4	11.5	87.1	0.0	0.0	
106	1,881.3	69.7	1,915.5	34.1	109.7	0.0	0.0	
107	1,880.1	51.8	1,913.5	33.4	110.9	0.0	0.0	
108	1,884.1	48.6	1,909.6	25.4	106.9	0.0	0.0	
109	1,884.6	32.4	1,907.5	22.9	106.4	0.0	0.0	
112	1,900.7	0.0	1,893.8	-6.9	90.3	0.0	0.0	
113	1,878.5	47.0	1,914.4	35.9	112.5	0.0	0.0	
114	1,897.3	92.3	1,914.2	16.9	93.7	0.0	0.0	
117	1,907.5	95.6	1,914.6	7.1	83.5	0.0	0.0	
118	1,889.0	59.9	1,926.1	37.1	102.0	0.0	0.0	
119	1,889.1	103.7	1,925.8	36.7	101.9	0.0	0.0	
120	1,871.2	183.1	1,929.5	58.3	119.8	0.0	0.0	
121	1,862.6	176.6	1,950.9	88.3	128.4	0.0	0.0	
122	1,950.0	144.2	1,959.7	9.7	41.0	0.0	0.0	
123	1,927.3	105.3	1,959.6	32.3	63.7	0.0	0.0	
124	1,879.6	110.2	1,959.0	79.4	111.4	0.0	0.0	
125	1,886.2	175.0	1,957.8	71.7	104.8	0.0	0.0	

Net Work Analysis   Distribution Main

Node No.	Elevation of Pipe (MSL)	Demand (cum/d)	Dynamic Pressure (MSL)	Dynamic Pressure (m)	Static Pressure (m)	B	Leakage (cum/d)
126	1,894.1	173.3	1,956.2	62.1	96.9	0.0	0.0
127	1,874.9	87.5	1,953.8	78.9	116.1	0.0	0.0
128	1,896.4	61.6	1,954.5	58.1	94.6	0.0	0.0
129	1,896.0	13.0	1,954.5	58.5	95.0	0.0	0.0
130	1,886.4	11.3	1,954.5	68.0	104.6	0.0	0.0
131	1,875.8	6.5	1,954.4	78.6	115.2	0.0	0.0
132	1,886.8	82.6	1,924.2	37.4	104.2	0.0	0.0
133	1,898.7	29.2	1,923.4	24.7	92.3	0.0	0.0
134	1,924.5	87.5	1,932.2	7.7	66.5	0.0	0.0
135	1,915.7	94.0	1,928.9	13.2	75.3	0.0	0.0
136	1,944.8	115.0	1,976.1	31.3	46.2	0.0	0.0
137	1,905.0	191.2	1,977.0	72.0	86.0	0.0	0.0
139	1,905.8	267.3	1,918.7	12.9	85.2	0.0	0.0
140	1,899.4	50.2	1,918.9	19.5	91.6	0.0	0.0
141	1,890.2	160.4	1,917.3	27.1	100.8	0.0	0.0
142	1,883.9	166.9	1,917.4	33.5	107.1	0.0	0.0
143	1,888.7	178.2	1,917.4	28.7	102.3	0.0	0.0
144	1,907.4	63.2	1,924.0	16.6	83.6	0.0	0.0
145	1,909.3	9.7	1,924.0	14.7	81.7	0.0	0.0
146	1,876.5	87.5	1,917.0	40.5	114.5	0.0	0.0
147	1,878.9	158.8	1,917.0	38.1	112.1	0.0	0.0
148	1,889.6	102.1	1,926.7	37.1	101.4	0.0	0.0
149	1,901.1	45.4	1,928.5	27.4	89.9	0.0	0.0
150	1,899.4	191.2	1,920.4	21.0	91.6	0.0	0.0
151	1,874.4	123.1	1,917.0	42.6	116.6	0.0	0.0
152	1,865.9	106.9	1,916.3	50.4	125.1	0.0	0.0
153	1,862.7	115.0	1,916.5	53.8	128.3	0.0	0.0
154	1,864.7	106.9	1,916.5	51.8	126.3	0.0	0.0
155	1,867.6	35.6	1,916.6	49.0	123.4	0.0	0.0
156	1,884.8	64.8	1,925.4	40.6	106.2	0.0	0.0
157	1,881.9	38.9	1,925.1	43.2	109.1	0.0	0.0
158	1,880.3	38.9	1,925.1	44.8	110.7	0.0	0.0
160	1,903.2	30.8	1,977.4	74.2	87.8	0.0	0.0
161	1,905.3	17.8	1,918.8	13.5	85.7	0.0	0.0
162	1,891.8	61.6	1,919.1	27.3	99.2	0.0	0.0
163	1,899.3	11.3	1,919.1	19.8	91.7	0.0	0.0
164	1,919.8	6.5	1,932.2	12.4	71.2	0.0	0.0
165	1,962.5	163.6	1,990.5	28.0	28.5	0.0	0.0
166	1,899.0	29.2	1,924.6	25.6	92.0	0.0	0.0
169	1,917.8	35.6	1,924.2	6.4	73.2	0.0	0.0
170	1,893.3	21.1	1,924.8	31.5	97.7	0.0	0.0
171	1,909.7	30.8	1,926.2	16.5	81.3	0.0	0.0
21	1,885.1	157.1	1,918.7	33.5	105.9	0.0	0.0
20	1,885.9	134.5	1,918.6	32.7	105.1	0.0	0.0
174	1,902.4	168.5	1,917.6	15.2	88.6	0.0	0.0
53	1,895.7	157.1	1,917.7	22.0	95.3	0.0	0.0
176	1,895.0	37.3	1,921.9	26.9	96.0	0.0	0.0
177	1,897.3	37.3	1,921.9	24.6	93.7	0.0	0.0
178	1,912.8	89.1	1,921.8	9.1	78.2	0.0	0.0
179	1,917.5	40.5	1,922.4	4.9	73.5	0.0	0.0
181	1,881.0	129.6	1,920.0	39.0	110.0	0.0	0.0
182	1,891.9	21.1	1,913.2	21.3	99.1	0.0	0.0
183	1,899.2	19.4	1,909.3	10.1	91.8	0.0	0.0
185	1,902.8	106.9	1,916.8	14.1	88.2	0.0	0.0
186	1,885.4	106.9	1,916.8	31.4	105.6	0.0	0.0
187	1,903.2	123.1	1,977.1	73.9	87.8	0.0	0.0
188	1,931.7	13.0	1,949.5	17.8	59.3	0.0	0.0
189	1,921.8	47.0	1,920.8	-1.0	69.2	0.0	0.0
300	1,903.6	76.1	1,977.4	73.8	87.4	0.0	0.0
301	1,951.4	123.1	1,977.5	26.1	39.6	0.0	0.0
402	1,955.5	0.0	1,953.9	-1.6	35.5	0.0	0.0
403	1,954.4	0.0	1,952.2	-2.2	36.6	0.0	0.0
404	1,953.8	0.0	1,951.1	-2.7	37.2	0.0	0.0
405	1,952.5	0.0	1,949.0	-3.5	38.5	0.0	0.0
406	1,951.8	0.0	1,947.9	-3.9	39.2	0.0	0.0
407	1,951.3	0.0	1,947.2	-4.2	39.7	0.0	0.0
408	1,950.7	0.0	1,946.1	-4.6	40.3	0.0	0.0
409	1,950.0	0.0	1,945.0	-5.0	41.0	0.0	0.0
410	1,947.8	0.0	1,941.3	-6.5	43.2	0.0	0.0
411	1,947.4	0.0	1,940.8	-6.6	43.6	0.0	0.0
412	1,946.9	0.0	1,939.9	-7.0	44.1	0.0	0.0
414	1,941.7	0.0	1,931.4	-10.3	49.3	0.0	0.0
415	1,940.8	0.0	1,930.0	-10.8	50.2	0.0	0.0
59	1,900.0	197.6	1,917.1	17.1	91.0	0.0	0.0
500	1,892.8	40.5	1,916.6	23.8	98.2	0.0	0.0
501	1,886.6	123.1	1,916.6	30.0	104.4	0.0	0.0
502	1,885.6	129.6	1,945.5	59.9	105.4	0.0	0.0

Net Work Analysis   Distribution Main   B

Node No.	Elevation of Pipe (MSL)	Demand (cum/d)	Dynamic Pressure (MSL)	Dynamic Pressure (m)	Static Pressure (m)			Leakage (cum/d)
503	1,884.2	123.1	1,928.2	44.0	106.8	0.0	0.0	
510	1,914.5	82.6	1,918.7	4.2	76.5	0.0	0.0	
511	1,892.1	32.4	1,901.4	9.3	98.9	0.0	0.0	
520	1,913.6	102.1	1,947.7	34.1	77.4	0.0	0.0	
304	1,900.4	113.4	1,909.7	9.3	90.6	0.0	0.0	
172	1,886.0	82.6	1,918.6	32.6	105.0	0.0	0.0	
173	1,916.0	82.6	1,918.0	2.0	75.0	0.0	0.0	
521	1,886.0	82.6	1,925.8	39.8	105.0	0.0	0.0	
522	1,880.0	82.6	1,926.7	46.7	111.0	0.0	0.0	
523	1,903.0	82.6	1,917.0	14.0	88.0	0.0	0.0	
524	1,887.0	82.6	1,945.9	58.9	104.0	0.0	0.0	
525	1,881.0	82.6	1,942.6	61.6	110.0	0.0	0.0	
526	1,882.0	82.6	1,932.1	50.1	109.0	0.0	0.0	
527	1,931.0	48.6	1,957.5	26.5	60.0	0.0	0.0	
528	1,943.0	48.6	1,938.5	-4.5	48.0	0.0	0.0	
33	1,867.0	82.6	1,916.1	49.1	124.0	0.0	0.0	
35	1,870.0	98.8	1,916.1	46.1	121.0	0.0	0.0	
40	1,920.0	64.8	1,921.7	1.7	71.0	0.0	0.0	
54	1,886.0	82.6	1,918.8	32.8	105.0	0.0	0.0	
540	1,930.0	657.7	1,935.0	5.0	61.0	0.0	0.0	
541	1,980.0	904.0	1,985.0	5.0	11.0	0.0	0.0	

Net Work Analysis Distribution Main

Pipe No.	Node A	Node B	Length (m)	Diameter (mm)	C	Flow (cum/d)	Velocity (m/s)	Pressure Gradient (o/oo)	Loss (m)
1	139	510	800.00	225.00	120.00	82.00	0.00	0.00	0.00
2	139	304	374.00	44.00	130.00	113.00	0.90	24.20	9.00
3	139	140	162.00	150.00	120.00	-463.00	-0.30	-1.00	-0.20
4	140	161	222.00	65.00	120.00	17.00	0.10	0.10	0.00
5	51	140	228.00	150.00	120.00	531.00	0.30	1.30	0.30
6	162	163	143.00	44.00	130.00	11.00	0.10	0.30	0.10
7	51	162	20.00	150.00	120.00	72.00	0.10	0.00	0.00
8	51	135	690.00	100.00	120.00	-680.00	-1.00	-14.20	-9.80
9	134	135	178.00	65.00	130.00	270.00	0.90	18.10	3.20
12	134	164	84.00	44.00	130.00	6.00	0.10	0.10	0.00
13	66	135	265.00	150.00	120.00	503.00	0.30	1.10	0.30
14	50	66	530.00	100.00	120.00	568.00	0.80	10.20	5.40
15	50	67	583.00	100.00	120.00	-801.00	-1.20	-19.20	-11.20
16	67	188	165.00	100.00	120.00	-863.00	-1.30	-22.10	-3.60
20	21	54	59.00	150.00	120.00	-887.00	-0.60	-3.20	-0.20
21	21	23	88.00	100.00	120.00	354.00	0.50	4.30	0.40
22	23	24	55.00	150.00	120.00	55.00	0.00	0.00	0.00
23	20	24	90.00	100.00	120.00	328.00	0.50	3.70	0.30
24	20	21	66.00	150.00	120.00	-375.00	-0.30	-0.70	0.00
25	25	174	569.00	100.00	120.00	168.00	0.30	1.10	0.60
26	25	52	110.00	100.00	120.00	110.00	0.20	0.50	0.10
27	52	53	176.00	100.00	120.00	260.00	0.40	2.40	0.40
28	53	60	100.00	100.00	120.00	-159.00	-0.20	-1.00	-0.10
29	18	60	134.00	100.00	120.00	448.00	0.70	6.60	0.90
30	18	19	54.00	150.00	120.00	512.00	0.30	1.20	0.10
31	19	52	151.00	100.00	120.00	307.00	0.50	3.30	0.50
32	19	55	133.00	100.00	120.00	67.00	0.10	0.20	0.00
33	54	172	100.00	100.00	120.00	247.00	0.40	2.20	0.20
34	9	18	315.00	225.00	120.00	1,133.00	0.30	0.70	0.20
35	9	48	47.00	100.00	120.00	-2,265.00	-3.30	-131.70	-6.20
36	1	48	265.00	225.00	120.00	2,420.00	0.70	2.90	0.80
37	48	49	201.00	100.00	120.00	-8.00	0.00	0.00	0.00
38	22	49	672.00	150.00	120.00	-1,345.00	-0.90	-7.00	-4.70
40	49	148	536.00	100.00	120.00	-289.00	-0.40	-2.90	-1.60
41	148	171	372.00	50.00	120.00	30.00	0.20	1.30	0.50
42	69	148	325.00	100.00	120.00	422.00	0.60	5.90	1.90
43	46	69	90.00	150.00	120.00	549.00	0.40	1.30	0.10
44	69	149	551.00	100.00	120.00	45.00	0.10	0.10	0.10
45	1	49	264.00	100.00	120.00	287.00	0.40	2.90	0.80
46	1	46	401.00	225.00	120.00	-3,941.00	-1.10	-7.10	-2.80
48	47	64	268.00	100.00	120.00	-232.00	-0.30	-1.90	-0.50
49	63	64	444.00	300.00	120.00	2,650.00	0.40	0.80	0.40
51	63	158	47.00	300.00	120.00	-2,712.00	-0.40	-0.90	0.00
52	158	166	358.00	50.00	120.00	29.00	0.20	1.20	0.40
53	157	158	77.00	300.00	120.00	2,780.00	0.50	0.90	0.10
54	157	170	264.00	44.00	130.00	21.00	0.20	1.10	0.30
55	156	157	300.00	300.00	120.00	2,840.00	0.50	0.90	0.30
56	2	156	100.00	300.00	120.00	3,844.00	0.60	1.70	0.20
59	156	169	440.00	44.00	130.00	35.00	0.30	2.80	1.30
61	2	203	704.00	350.00	120.00	-6,401.00	-0.80	-2.00	-1.40
62	2	4	442.00	225.00	120.00	2,443.00	0.70	2.90	1.30
63	4	5	65.00	225.00	120.00	2,239.00	0.70	2.50	0.20
64	4	61	972.00	65.00	130.00	81.00	0.30	1.90	1.90
65	5	6	221.00	150.00	120.00	1,060.00	0.70	4.50	1.00
66	6	27	150.00	150.00	120.00	937.00	0.60	3.60	0.50
67	27	37	216.00	100.00	120.00	67.00	0.10	0.20	0.00
68	36	37	400.00	150.00	120.00	795.00	0.50	2.60	1.10
69	36	38	563.00	100.00	120.00	236.00	0.30	2.00	1.10
70	37	38	30.00	150.00	120.00	786.00	0.50	2.60	0.10
71	38	178	452.00	150.00	120.00	565.00	0.40	1.40	0.60
72	27	181	1,106.00	150.00	120.00	748.00	0.50	2.40	2.60
73	38	39	300.00	150.00	120.00	389.00	0.30	0.70	0.20
74	39	173	320.00	44.00	130.00	82.00	0.60	13.40	4.30
75	181	189	400.00	150.00	120.00	-667.00	-0.40	-1.90	-0.80
76	102	181	92.00	150.00	120.00	-1,286.00	-0.80	-6.40	-0.60
80	39	179	125.00	150.00	120.00	-533.00	-0.30	-1.30	-0.20
81	39	41	100.00	150.00	120.00	455.00	0.30	0.90	0.10
82	179	208	104.00	65.00	130.00	-573.00	-2.00	-72.80	-7.60
83	102	103	350.00	150.00	120.00	1,229.00	0.80	5.90	2.10
84	101	102	120.00	44.00	130.00	2.00	0.00	0.00	0.00
86	41	100	120.00	44.00	130.00	96.00	0.70	17.90	2.10
87	100	101	312.00	37.00	130.00	18.00	0.20	2.00	0.60
88	42	43	257.00	100.00	120.00	113.00	0.20	0.50	0.10
89	42	43	257.00	100.00	120.00	113.00	0.20	0.50	0.10
90	43	44	268.00	150.00	120.00	162.00	0.10	0.10	0.00
91	44	177	391.00	100.00	120.00	37.00	0.10	0.10	0.00
92	44	176	391.00	100.00	120.00	37.00	0.10	0.10	0.00

Net Work Analysis

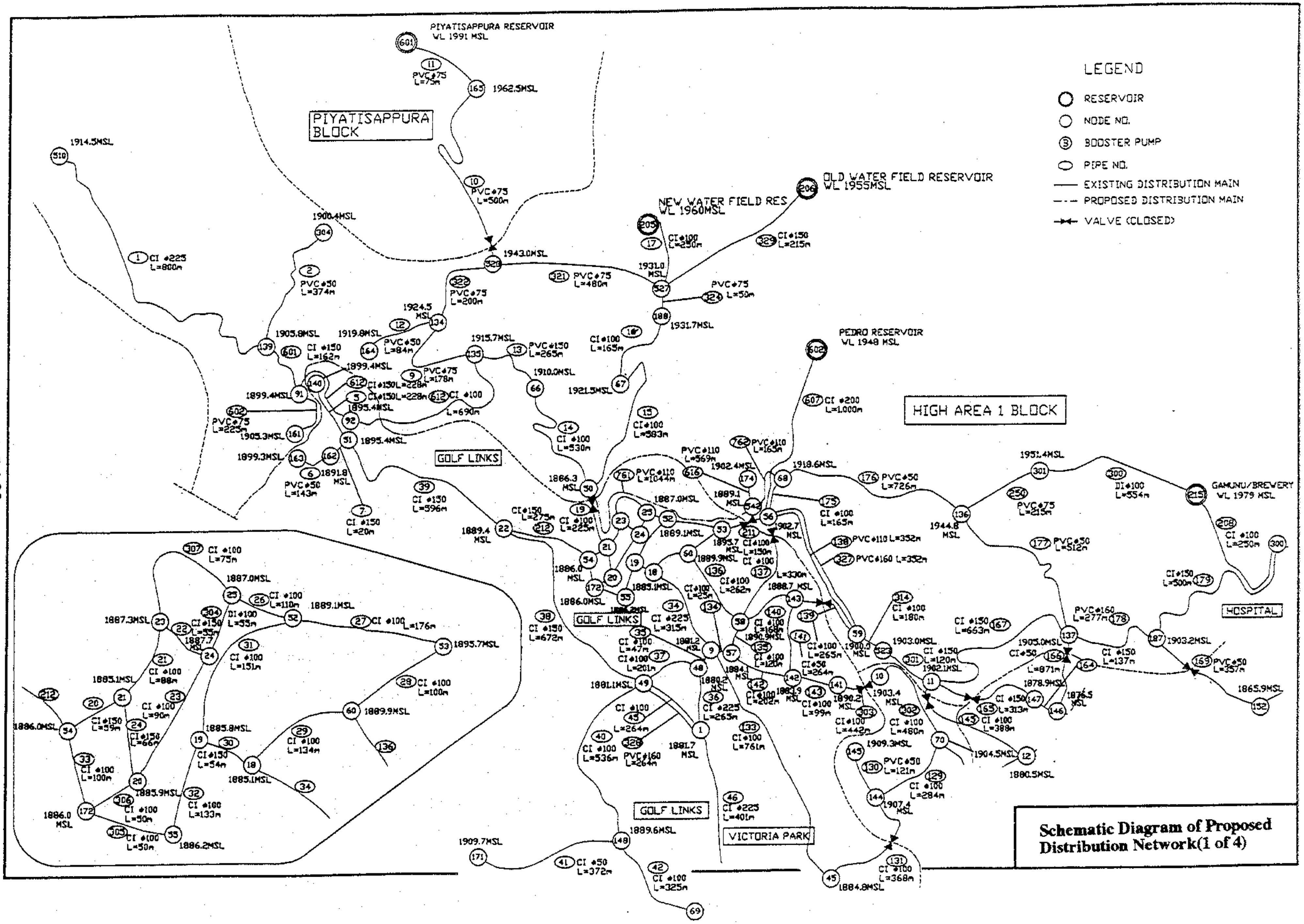
Distribution Main

Pipe No.	Node A	Node B	Length (m)	Diameter (mm)	C	Flow (cum/d)	Velocity (m/s)	Pressure Gradient (o/oo)	Loss (m)
93	176	177	90.00	100.00	120.00	0.00	0.00	0.00	0.00
99	29	112	251.00	65.00	130.00	-21.00	-0.10	-0.20	0.00
100	109	511	400.00	100.00	120.00	711.00	1.10	15.40	6.20
101	108	109	120.00	100.00	120.00	743.00	1.10	16.70	2.00
102	108	183	228.00	44.00	130.00	19.00	0.10	0.90	0.20
103	107	108	200.00	100.00	120.00	811.00	1.20	19.70	3.90
104	107	182	253.00	44.00	130.00	21.00	0.20	1.10	0.30
105	28	107	40.00	100.00	120.00	884.00	1.30	23.10	0.90
106	28	113	66.00	150.00	120.00	93.00	0.10	0.10	0.00
107	113	114	265.00	65.00	130.00	46.00	0.20	0.70	0.20
108	114	117	500.00	65.00	130.00	-45.00	-0.20	-0.70	-0.30
109	117	118	318.00	44.00	130.00	-141.00	-1.10	-36.40	-11.60
111	118	119	248.00	75.00	120.00	93.00	0.20	1.50	0.40
113	28	106	250.00	150.00	120.00	-1,020.00	-0.70	-4.20	-1.00
114	103	106	400.00	150.00	120.00	1,093.00	0.70	4.70	1.90
115	105	106	250.00	44.00	130.00	-3.00	0.00	0.00	0.00
116	104	105	300.00	44.00	130.00	24.00	0.20	1.40	0.40
117	103	104	239.00	44.00	130.00	54.00	0.40	6.30	1.50
118	30	526	210.00	100.00	120.00	-547.00	-0.80	-9.50	-2.00
120	155	500	175.00	140.00	130.00	-142.00	-0.10	-0.10	0.00
121	150	185	300.00	75.00	120.00	288.00	0.80	11.70	3.50
122	31	150	300.00	150.00	120.00	1,863.00	1.20	12.70	3.80
125	132	133	363.00	44.00	130.00	29.00	0.20	2.00	0.70
126	31	132	616.00	150.00	120.00	111.00	0.10	0.10	0.00
127	31	64	167.00	225.00	120.00	-2,346.00	-0.70	-2.70	-0.50
128	31	70	662.00	150.00	120.00	221.00	0.10	0.30	0.20
129	70	144	284.00	100.00	120.00	7.00	0.00	0.00	0.00
130	144	145	121.00	44.00	130.00	9.00	0.10	0.30	0.00
131	45	144	368.00	100.00	120.00	65.00	0.10	0.20	0.10
132	45	47	162.00	150.00	120.00	-174.00	-0.10	-0.20	0.00
134	9	57	25.00	100.00	120.00	916.00	1.40	24.60	0.60
135	57	58	120.00	100.00	120.00	404.00	0.60	5.40	0.70
136	58	60	262.00	100.00	120.00	-126.00	-0.20	-0.60	-0.20
137	56	58	330.00	100.00	120.00	-153.00	-0.20	-0.90	-0.30
140	58	143	168.00	100.00	120.00	185.00	0.30	1.30	0.20
141	142	143	264.00	50.00	120.00	-6.00	0.00	-0.10	0.00
142	57	142	202.00	100.00	120.00	360.00	0.50	4.40	0.90
143	141	142	99.00	100.00	120.00	-200.00	-0.30	-1.50	-0.10
145	11	12	388.00	100.00	120.00	-230.00	-0.30	-1.90	-0.70
146	12	150	360.00	150.00	120.00	-1,384.00	-0.90	-7.30	-2.60
147	12	151	163.00	150.00	120.00	1,046.00	0.70	4.40	0.70
148	13	151	35.00	150.00	120.00	-635.00	-0.40	-1.70	-0.10
149	151	186	450.00	140.00	130.00	288.00	0.20	0.50	0.20
151	154	155	132.00	100.00	120.00	-106.00	-0.20	-0.50	-0.10
160	153	154	165.00	100.00	120.00	-56.00	-0.10	-0.10	0.00
161	14	153	236.00	150.00	120.00	58.00	0.00	0.00	0.00
162	13	14	475.00	150.00	120.00	454.00	0.30	0.90	0.40
163	13	146	35.00	150.00	120.00	99.00	0.10	0.10	0.00
164	146	147	137.00	150.00	120.00	11.00	0.00	0.00	0.00
165	11	147	313.00	150.00	120.00	147.00	0.10	0.10	0.00
168	14	152	66.00	100.00	120.00	288.00	0.40	2.90	0.20
170	33	152	150.00	100.00	120.00	-181.00	-0.30	-1.20	-0.20
176	68	136	726.00	44.00	130.00	-68.00	-0.50	-9.40	-6.80
177	136	137	512.00	44.00	130.00	-27.00	-0.20	-1.80	-0.90
178	137	187	277.00	140.00	130.00	-218.00	-0.20	-0.30	-0.10
181	71	122	400.00	225.00	120.00	-1,368.00	-0.40	-1.00	-0.40
182	71	124	400.00	225.00	120.00	1,227.00	0.40	0.80	0.30
183	15	124	441.00	225.00	120.00	-1,166.00	-0.30	-0.70	-0.30
184	15	16	177.00	150.00	120.00	1,067.00	0.70	4.50	0.80
185	16	121	286.00	100.00	120.00	912.00	1.40	24.50	7.00
186	120	121	1,210.00	75.00	120.00	-358.00	-0.90	-17.60	-21.30
187	16	125	850.00	100.00	120.00	17.00	0.00	0.00	0.00
188	123	125	764.00	100.00	120.00	255.00	0.40	2.30	1.80
189	123	124	120.00	44.00	130.00	49.00	0.40	5.20	0.60
190	122	123	160.00	140.00	130.00	332.00	0.30	0.60	0.10
191	122	209	120.00	225.00	120.00	-2,178.00	-0.60	-2.40	-0.30
193	125	126	396.00	100.00	120.00	353.00	0.50	4.20	1.70
194	126	128	668.00	65.00	130.00	92.00	0.30	2.50	1.60
195	126	127	1,047.00	65.00	130.00	87.00	0.30	2.20	2.30
196	128	129	90.00	65.00	130.00	30.00	0.10	0.30	0.00
197	129	130	60.00	44.00	130.00	17.00	0.10	0.80	0.10
198	130	131	88.00	37.00	130.00	6.00	0.10	0.30	0.00
199	62	520	569.00	100.00	120.00	-275.00	-0.40	-2.70	-1.50
200	41	42	237.00	100.00	120.00	61.00	0.10	0.20	0.00
203	5	36	105.00	150.00	120.00	1,114.00	0.70	4.90	0.50
179	187	300	500.00	150.00	120.00	-341.00	-0.20	-0.60	-0.30
250	136	301	215.00	65.00	130.00	-155.00	-0.50	-6.50	-1.40

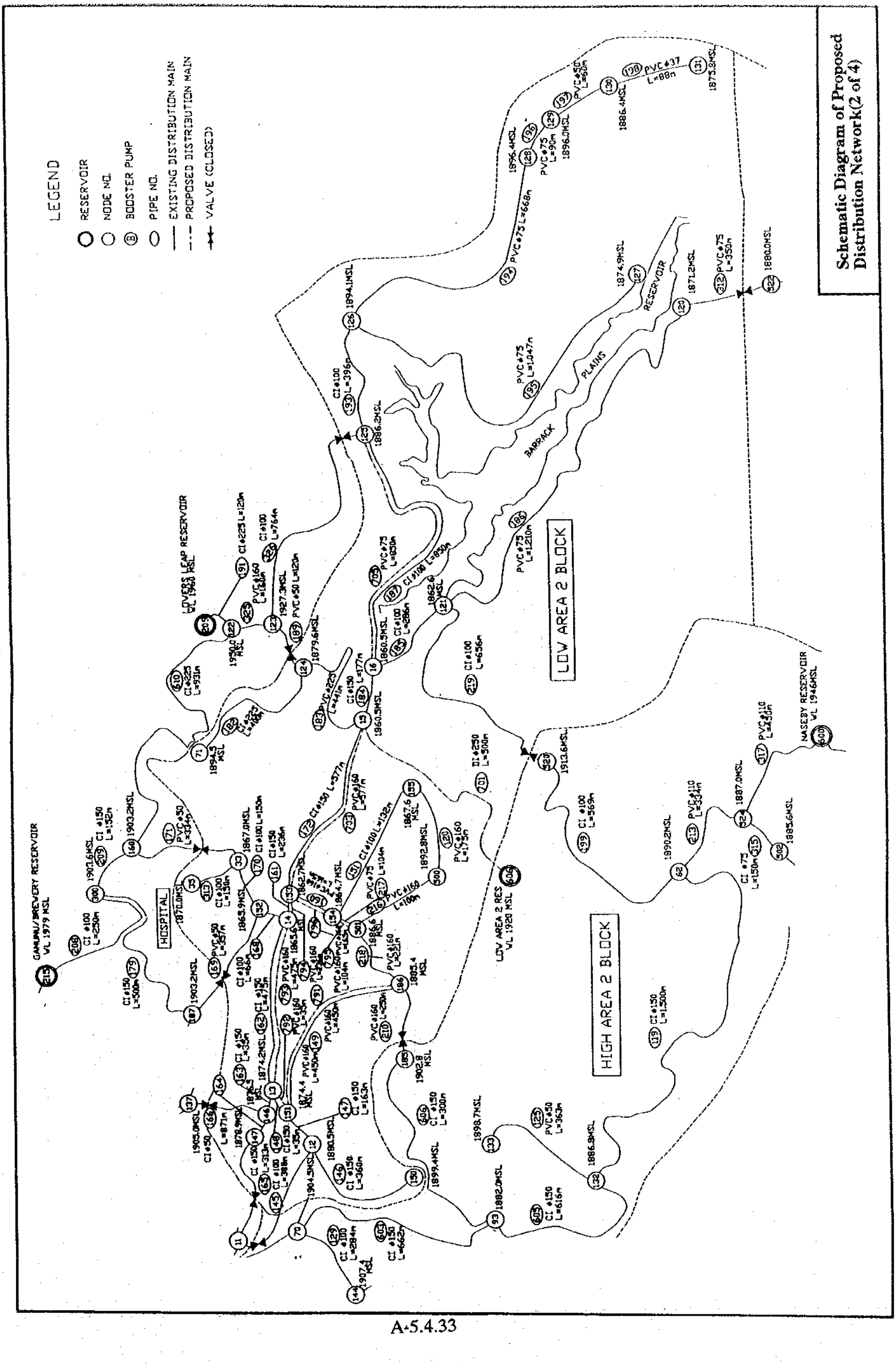
Net Work Analysis

Distribution Main

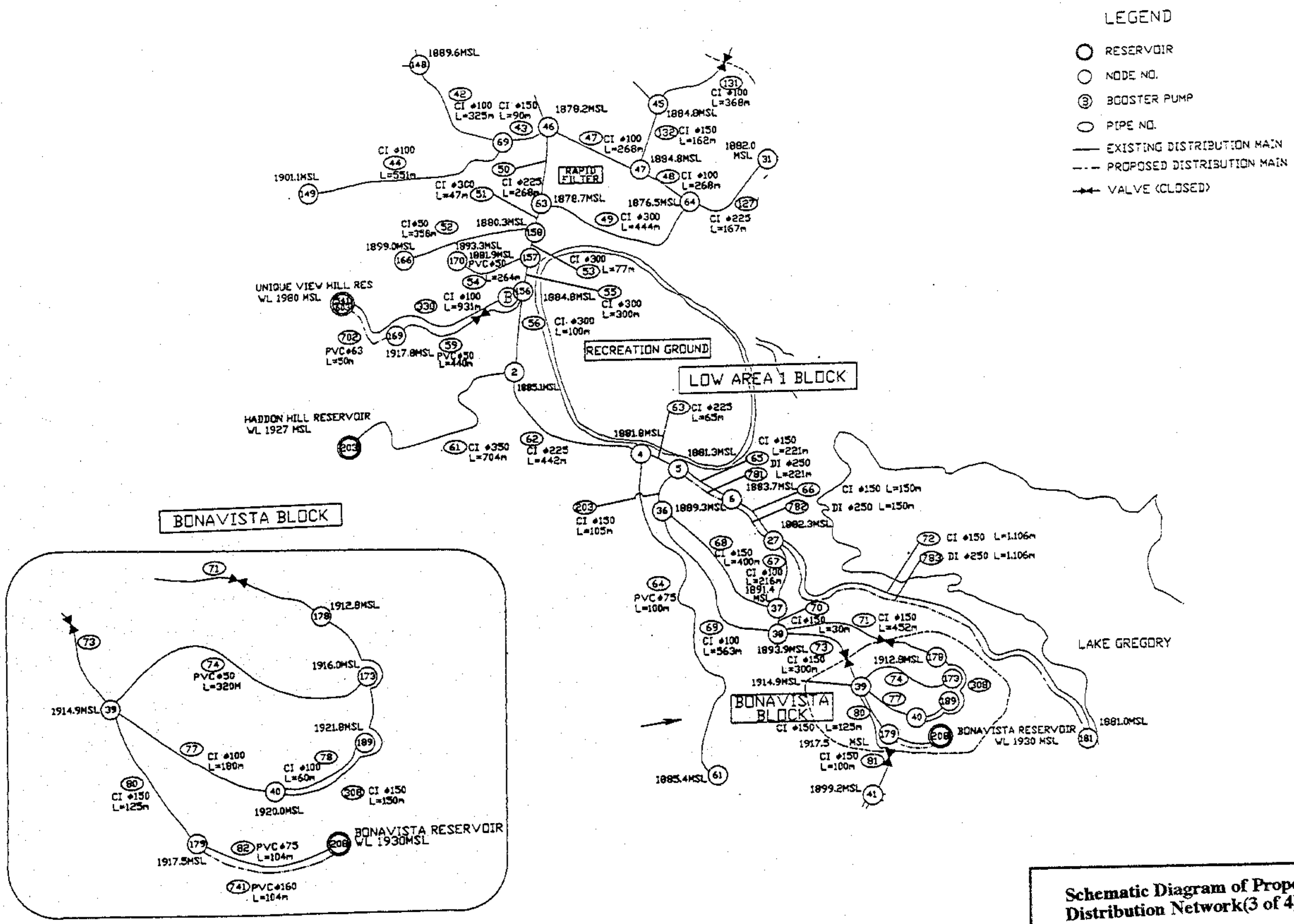
Pipe No.	Node A	Node B	Length (m)	Diameter (mm)	C	Flow (cum/d)	Velocity (m/s)	Pressure Gradient (o/oo)	Loss (m)
209	160	300	152.00	150.00	120.00	-30.00	0.00	0.00	0.00
210	185	186	250.00	140.00	130.00	181.00	0.10	0.20	0.10
211	53	56	150.00	100.00	120.00	262.00	0.40	2.40	0.40
213	62	524	334.00	97.00	130.00	152.00	0.20	0.90	0.30
214	30	503	334.00	100.00	120.00	417.00	0.60	5.80	1.90
215	112	511	132.00	75.00	120.00	-678.00	-1.80	-57.40	-7.60
216	500	501	100.00	140.00	130.00	-182.00	-0.10	-0.20	0.00
217	154	501	104.00	65.00	130.00	-56.00	-0.20	-1.00	-0.10
218	186	501	221.00	140.00	130.00	362.00	0.30	0.70	0.20
219	121	520	656.00	100.00	120.00	377.00	0.60	4.80	3.10
110	118	503	167.00	75.00	120.00	-294.00	-0.80	-12.20	-2.00
300	215	301	554.00	100.00	120.00	278.00	0.40	2.70	1.50
208	215	300	250.00	100.00	120.00	448.00	0.70	6.60	1.60
17	205	527	250.00	100.00	120.00	567.00	0.80	10.10	2.50
303	10	141	442.00	100.00	120.00	-40.00	-0.10	-0.10	0.00
304	24	25	55.00	100.00	120.00	195.00	0.30	1.40	0.10
305	55	172	50.00	100.00	120.00	-77.00	-0.10	-0.30	0.00
306	20	172	50.00	100.00	120.00	-87.00	-0.10	-0.30	0.00
307	23	25	75.00	100.00	120.00	166.00	0.20	1.00	0.10
308	40	178	150.00	150.00	120.00	-476.00	-0.30	-1.00	-0.10
77	39	40	180.00	100.00	120.00	303.00	0.50	3.20	0.60
78	40	189	60.00	100.00	120.00	714.00	1.10	15.60	0.90
79	100	101	450.00	44.00	130.00	24.00	0.20	1.40	0.60
309	41	42	150.00	150.00	120.00	227.00	0.10	0.30	0.00
310	119	521	350.00	65.00	130.00	-10.00	0.00	0.00	0.00
311	521	522	350.00	65.00	130.00	-93.00	-0.30	-2.50	-0.90
312	120	522	350.00	65.00	130.00	175.00	0.60	8.10	2.90
313	33	35	150.00	100.00	120.00	98.00	0.10	0.40	0.10
301	11	523	120.00	150.00	120.00	-56.00	0.00	0.00	0.00
314	59	523	180.00	100.00	120.00	139.00	0.20	0.80	0.10
315	502	524	150.00	75.00	120.00	-129.00	-0.30	-2.70	-0.40
316	525	600	450.00	75.00	120.00	-227.00	-0.60	-7.60	-3.40
317	524	600	450.00	97.00	130.00	-60.00	-0.10	-0.20	-0.10
318	525	600	450.00	97.00	130.00	-484.00	-0.80	-7.60	-3.40
319	525	526	210.00	75.00	120.00	629.00	1.60	50.00	10.50
321	527	528	480.00	65.00	130.00	413.00	1.40	39.60	19.00
322	134	528	200.00	65.00	130.00	-364.00	-1.30	-31.40	-6.30
11	165	601	75.00	65.00	130.00	-163.00	-0.60	-7.10	-0.50
324	188	527	50.00	65.00	130.00	-876.00	-3.10	-159.40	-8.00
325	122	123	160.00	140.00	130.00	332.00	0.30	0.60	0.10
326	123	125	764.00	97.00	130.00	255.00	0.40	2.30	1.80
327	56	59	352.00	140.00	130.00	336.00	0.30	0.70	0.20
328	1	49	264.00	158.00	130.00	1,036.00	0.60	2.90	0.80
329	206	527	215.00	150.00	120.00	770.00	0.50	2.50	0.50
330	156	541	931.00	100.00	120.00	904.00	1.30	24.00	22.40
331	112	540	434.00	97.00	130.00	657.00	1.00	13.30	5.80
212	22	54	275.00	150.00	120.00	1,217.00	0.80	5.80	1.60
401	402	602	234.00	200.00	120.00	-4,696.00	-1.70	-17.40	-4.10
402	402	403	101.00	200.00	120.00	4,696.00	1.70	17.40	1.80
403	403	404	61.00	200.00	120.00	4,696.00	1.70	17.40	1.10
404	404	405	122.00	200.00	120.00	4,696.00	1.70	17.40	2.10
405	405	406	65.00	200.00	120.00	4,696.00	1.70	17.40	1.10
406	406	407	42.00	200.00	120.00	4,696.00	1.70	17.40	0.70
407	407	408	61.00	200.00	120.00	4,696.00	1.70	17.40	1.10
408	408	409	61.00	200.00	120.00	4,696.00	1.70	17.40	1.10
409	409	410	215.00	200.00	120.00	4,696.00	1.70	17.40	3.70
410	410	411	90.00	250.00	120.00	4,696.00	1.10	5.90	0.50
411	411	412	152.00	250.00	120.00	4,696.00	1.10	5.90	0.90
413	412	414	488.00	200.00	120.00	4,696.00	1.70	17.40	8.50
414	414	415	80.00	200.00	120.00	4,696.00	1.70	17.40	1.40
415	46	415	75.00	200.00	120.00	-4,696.00	-1.70	-17.40	-1.30



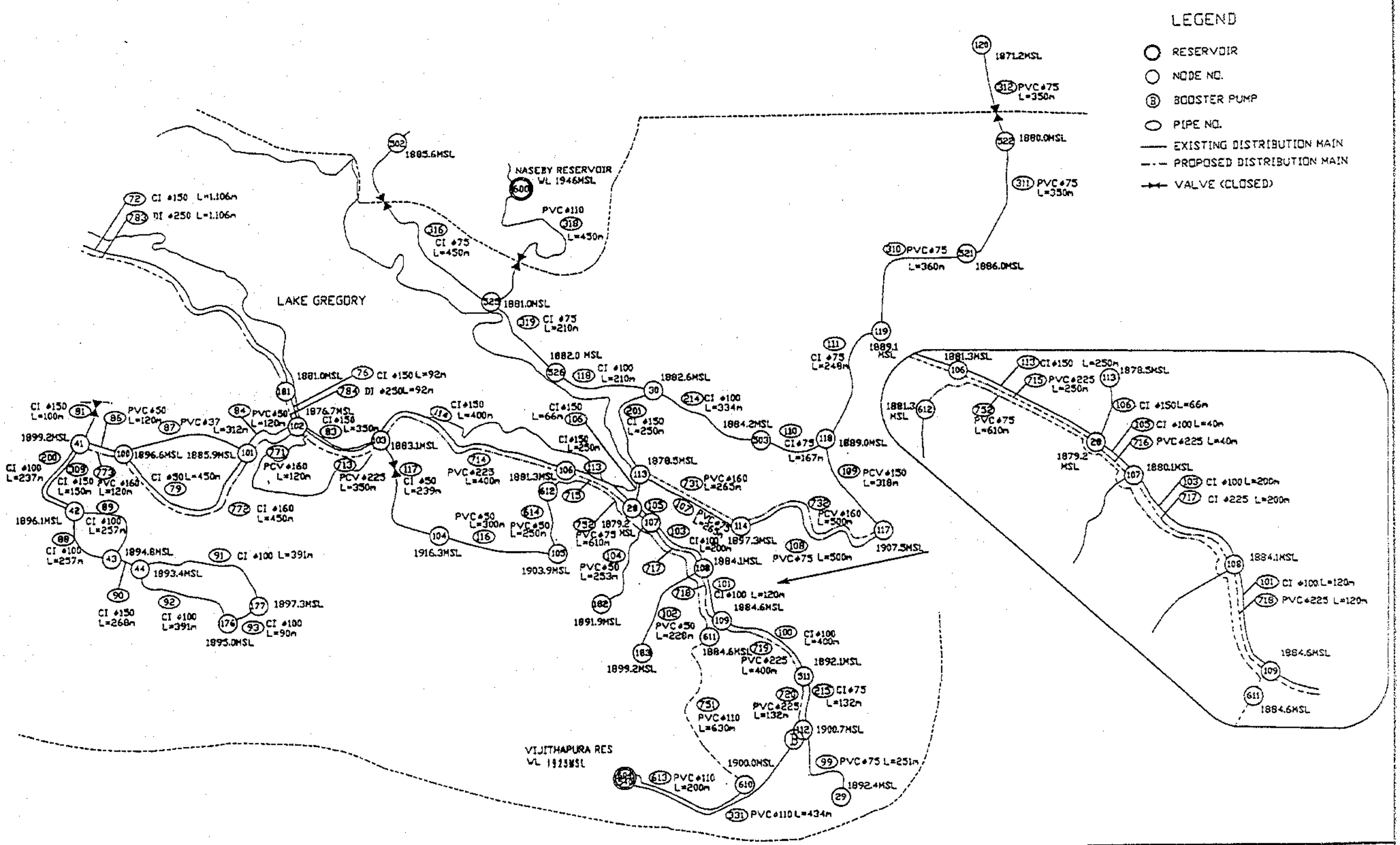
Schematic Diagram of Proposed Distribution Network(1 of 4)



Schematic Diagram of Proposed Distribution Network(2 of 4)



Schematic Diagram of Proposed Distribution Network(3 of 4)



Schematic Diagram of Proposed Distribution Network(4 of 4)

Net Work Analysis   Distribution Main

File Name	Nuwara201Year1995(2)	C
Season	Dry	
Network Type	Proposed	
Demand	Year 1995	
	Day Mean	
Reserver	Water Level Fix	Except for Follows
	Discharge Fix	No.205,206,215,209

Magnification of Demand 0.739

Reservoir Data

Node		HWL (MSL)	LWL (MSL)	Reservoir
203	1	1,927.0	1,927.0	Haddon Hill
208	1	1,930.0	1,930.0	Bonavista
600	1	1,946.0	1,946.0	Naseby
601	1	1,991.0	1,991.0	Piyatisappura
602	1	1,948.0	1,948.0	New Pedro Reserver
603	1	1,980.0	1,980.0	Unique View
604	1	1,925.0	1,925.0	Vijithapura
606	1	1,920.0	1,920.0	New Loe Area 2

Node Data

Node		Ground Elev (MSL)	Demand (cum/d)		
1	1	1,881.7	122.0	0	0
2	1	1,885.1	70.0	0	0
4	1	1,881.8	76.0	0	0
5	1	1,881.3	40.0	0	0
6	1	1,883.7	76.0	0	0
9	1	1,881.2	133.0	0	0
10	1	1,903.4	25.0	0	0
11	1	1,902.1	86.0	0	0
12	1	1,880.5	66.0	0	0
13	1	1,874.2	51.0	0	0
14	1	1,865.6	66.0	0	0
15	1	1,860.5	61.0	0	0
16	1	1,860.5	85.0	0	0
18	1	1,885.1	107.0	0	0
19	1	1,885.8	85.0	0	0
22	1	1,889.4	79.0	0	0
23	1	1,887.3	82.0	0	0
24	1	1,887.7	117.0	0	0
25	1	1,887.0	51.0	0	0
27	1	1,882.3	75.0	0	0
28	1	1,879.2	26.0	0	0
29	1	1,892.4	13.0	0	0
30	1	1,882.6	80.0	0	0
31	1	1,882.0	93.0	0	0
36	1	1,889.3	51.0	0	0
37	1	1,891.4	47.0	0	0
38	1	1,893.9	42.0	0	0
39	1	1,914.9	50.0	0	0
41	1	1,899.2	44.0	0	0
42	1	1,896.1	38.0	0	0
43	1	1,894.8	40.0	0	0
44	1	1,893.4	54.0	0	0
45	1	1,884.9	67.0	0	0
46	1	1,878.2	127.0	0	0
47	1	1,880.7	36.0	0	0
48	1	1,880.2	101.0	0	0
49	1	1,881.1	160.0	0	0
50	1	1,886.3	144.0	0	0
51	1	1,895.4	47.0	0	0
52	1	1,889.1	97.0	0	0
55	1	1,886.2	89.0	0	0
56	1	1,902.7	49.0	0	0
57	1	1,884.1	93.0	0	0
58	1	1,890.9	119.0	0	0
60	1	1,889.9	100.0	0	0
61	1	1,885.4	50.0	0	0

62	1	1,890.2	76.0	0	0
63	1	1,878.7	38.0	0	0
64	1	1,876.5	44.0	0	0
66	1	1,910.0	40.0	0	0
67	1	1,921.5	38.0	0	0
68	1	1,918.6	42.0	0	0
69	1	1,879.5	50.0	0	0
70	1	1,904.5	132.0	0	0
71	1	1,894.5	87.0	0	0
100	1	1,896.6	33.0	0	0
101	1	1,885.9	25.0	0	0
102	1	1,876.7	37.0	0	0
103	1	1,883.1	50.0	0	0
104	1	1,916.3	19.0	0	0
105	1	1,903.9	17.0	0	0
106	1	1,881.3	43.0	0	0
107	1	1,880.1	32.0	0	0
108	1	1,884.1	30.0	0	0
109	1	1,884.6	20.0	0	0
112	1	1,900.7	0.0	0	0
113	1	1,878.5	29.0	0	0
114	1	1,897.3	57.0	0	0
117	1	1,907.5	59.0	0	0
118	1	1,889.0	37.0	0	0
119	1	1,889.1	64.0	0	0
120	1	1,871.2	113.0	0	0
121	1	1,862.6	109.0	0	0
122	1	1,950.0	89.0	0	0
123	1	1,927.3	65.0	0	0
124	1	1,879.6	68.0	0	0
125	1	1,886.2	108.0	0	0
126	1	1,894.1	107.0	0	0
127	1	1,874.9	54.0	0	0
128	1	1,896.4	38.0	0	0
129	1	1,896.0	8.0	0	0
130	1	1,886.4	7.0	0	0
131	1	1,875.8	4.0	0	0
132	1	1,886.8	51.0	0	0
133	1	1,898.7	18.0	0	0
134	1	1,924.5	54.0	0	0
135	1	1,915.7	58.0	0	0
136	1	1,944.8	71.0	0	0
137	1	1,905.0	118.0	0	0
139	1	1,905.8	165.0	0	0
140	1	1,899.4	31.0	0	0
141	1	1,890.2	99.0	0	0
142	1	1,883.9	103.0	0	0
143	1	1,888.7	110.0	0	0
144	1	1,907.4	39.0	0	0
145	1	1,909.3	6.0	0	0
146	1	1,876.5	54.0	0	0
147	1	1,878.9	98.0	0	0
148	1	1,889.6	63.0	0	0
149	1	1,901.1	28.0	0	0
150	1	1,899.4	118.0	0	0
151	1	1,874.4	76.0	0	0
152	1	1,865.9	66.0	0	0
153	1	1,862.7	71.0	0	0
154	1	1,864.7	66.0	0	0
155	1	1,867.6	22.0	0	0
156	1	1,884.8	40.0	0	0
157	1	1,881.9	24.0	0	0
158	1	1,880.3	24.0	0	0
160	1	1,903.2	19.0	0	0
161	1	1,905.3	11.0	0	0
162	1	1,891.8	38.0	0	0
163	1	1,899.3	7.0	0	0
164	1	1,919.8	4.0	0	0
165	1	1,962.5	101.0	0	0
166	1	1,899.0	18.0	0	0
169	1	1,917.8	22.0	0	0
170	1	1,893.3	13.0	0	0
171	1	1,909.7	19.0	0	0
21	1	1,885.1	97.0	0	0
20	1	1,885.9	83.0	0	0

174	1	1,902.4	104.0	0	0
53	1	1,895.7	97.0	0	0
176	1	1,895.0	23.0	0	0
177	1	1,897.3	23.0	0	0
178	1	1,912.8	55.0	0	0
179	1	1,917.5	25.0	0	0
181	1	1,881.0	80.0	0	0
182	1	1,891.9	13.0	0	0
183	1	1,899.2	12.0	0	0
185	1	1,902.8	66.0	0	0
186	1	1,885.4	66.0	0	0
187	1	1,903.2	76.0	0	0
188	1	1,931.7	8.0	0	0
189	1	1,921.8	29.0	0	0
300	1	1,903.6	47.0	0	0
301	1	1,951.4	76.0	0	0
59	1	1,900.0	122.0	0	0
500	1	1,892.8	25.0	0	0
501	1	1,886.6	76.0	0	0
502	1	1,885.6	80.0	0	0
503	1	1,884.2	76.0	0	0
510	1	1,914.5	51.0	0	0
511	1	1,892.1	20.0	0	0
520	1	1,913.6	63.0	0	0
304	1	1,900.4	70.0	0	0
172	1	1,886.0	51.0	0	0
173	1	1,916.0	51.0	0	0
521	1	1,886.0	51.0	0	0
522	1	1,880.0	51.0	0	0
523	1	1,903.0	51.0	0	0
524	1	1,887.0	51.0	0	0
525	1	1,881.0	51.0	0	0
526	1	1,882.0	51.0	0	0
527	1	1,931.0	30.0	0	0
528	1	1,943.0	30.0	0	0
33	1	1,867.0	51.0	0	0
35	1	1,870.0	61.0	0	0
40	1	1,920.0	40.0	0	0
54	1	1,886.0	51.0	0	0
91	1	1,899.4	0.0	0	0
92	1	1,895.4	0.0	0	0
93	1	1,882.0	0.0	0	0
540	1	1,930.0	694.0	0	0
541	1	1,980.0	928.0	0	0
542	1	1,889.1	0.0	0	0
610	1	1,900.0	0.0	0	0
611	1	1,884.6	0.0	0	0
612	1	1,881.3	0.0	0	0
205	1	1,947.0	-51.0	0	0
206	1	1,947.0	-291.0	0	0
215	1	1,947.0	-197.0	0	0
209	1	1,947.0	-82.0	0	0

Booster Pump Data

No.	Type	Node A	Node B	Pipe No.	Pressure (m)
1	B	156	541	330	72.4
2	B	112	540	331	14.7

Pipe Data

Pipe No.	Node A	Node B	Diameter (mm)	Length (m)	C Value
1	139	510	225.0	800.0	120.0
2	139	304	44.0	374.0	130.0
5	51	140	150.0	228.0	120.0
6	162	163	44.0	143.0	130.0
7	51	162	150.0	20.0	120.0
9	134	135	65.0	178.0	130.0
12	134	164	44.0	84.0	130.0
13	66	135	150.0	265.0	120.0
14	50	66	100.0	530.0	120.0
15	50	67	100.0	583.0	120.0
16	67	188	100.0	165.0	120.0
20	21	54	150.0	59.0	120.0
21	21	23	100.0	88.0	120.0
22	23	24	150.0	55.0	120.0
23	20	24	100.0	90.0	120.0
24	20	21	150.0	66.0	120.0
26	25	52	100.0	110.0	120.0
27	52	53	100.0	176.0	120.0
28	53	60	100.0	100.0	120.0
29	18	60	100.0	134.0	120.0
30	18	19	150.0	54.0	120.0
31	19	52	100.0	151.0	120.0
32	19	55	100.0	133.0	120.0
33	54	172	100.0	100.0	120.0
34	9	18	225.0	315.0	120.0
35	9	48	100.0	47.0	120.0
36	1	48	225.0	265.0	120.0
37	48	49	100.0	201.0	120.0
38	22	49	150.0	672.0	120.0
39	22	51	150.0	596.0	120.0
40	49	148	100.0	536.0	120.0
41	148	171	50.0	372.0	120.0
42	69	148	100.0	325.0	120.0
43	46	69	150.0	90.0	120.0
44	69	149	100.0	551.0	120.0
45	1	49	100.0	264.0	120.0
46	1	46	225.0	401.0	120.0
47	46	47	100.0	268.0	120.0
48	47	64	100.0	268.0	120.0
49	63	64	300.0	444.0	120.0
50	46	63	225.0	268.0	120.0
51	63	158	300.0	47.0	120.0
52	158	166	50.0	358.0	120.0
53	157	158	300.0	77.0	120.0
54	157	170	44.0	264.0	130.0
55	156	157	300.0	300.0	120.0
56	2	156	300.0	100.0	120.0
61	2	203	350.0	704.0	120.0
62	2	4	225.0	442.0	120.0
63	4	5	225.0	65.0	120.0
64	4	61	65.0	972.0	130.0
65	5	6	150.0	221.0	120.0
66	6	27	150.0	150.0	120.0
67	27	37	100.0	216.0	120.0
68	36	37	150.0	400.0	120.0
69	36	38	100.0	563.0	120.0
70	37	38	150.0	30.0	120.0
72	27	181	150.0	1,106.0	120.0
74	39	173	44.0	320.0	130.0
76	102	181	150.0	92.0	120.0
80	39	179	150.0	125.0	120.0
82	179	208	65.0	104.0	130.0
83	102	103	150.0	350.0	120.0
84	101	102	44.0	120.0	130.0
86	41	100	44.0	120.0	130.0
87	100	101	37.0	312.0	130.0
88	42	43	100.0	257.0	120.0
89	42	43	100.0	257.0	120.0
90	43	44	150.0	268.0	120.0
91	44	177	100.0	391.0	120.0
92	44	176	100.0	391.0	120.0
93	176	177	100.0	90.0	120.0

99	29	112	65.0	251.0	130.0
100	109	511	100.0	400.0	120.0
101	108	109	100.0	120.0	120.0
102	108	183	44.0	228.0	130.0
103	107	108	100.0	200.0	120.0
104	107	182	44.0	253.0	130.0
105	28	107	100.0	40.0	120.0
106	28	113	150.0	66.0	120.0
107	113	114	65.0	265.0	130.0
108	114	117	65.0	500.0	130.0
109	117	118	44.0	318.0	130.0
111	118	119	75.0	248.0	120.0
113	28	106	150.0	250.0	120.0
114	103	106	150.0	400.0	120.0
116	104	105	44.0	300.0	130.0
118	30	526	100.0	210.0	120.0
119	62	132	150.0	1,500.0	120.0
120	155	500	140.0	175.0	130.0
125	132	133	44.0	363.0	130.0
127	31	64	225.0	167.0	120.0
129	70	144	100.0	284.0	120.0
130	144	145	44.0	121.0	130.0
132	45	47	150.0	162.0	120.0
133	9	45	100.0	761.0	120.0
134	9	57	100.0	25.0	120.0
135	57	58	100.0	120.0	120.0
136	58	60	100.0	262.0	120.0
138	56	59	97.0	352.0	130.0
140	58	143	100.0	168.0	120.0
141	142	143	50.0	264.0	120.0
142	57	142	100.0	202.0	120.0
143	141	142	100.0	99.0	120.0
146	12	150	150.0	360.0	120.0
147	12	151	150.0	163.0	120.0
148	13	151	150.0	35.0	120.0
149	151	186	140.0	450.0	130.0
151	154	155	100.0	132.0	120.0
160	153	154	100.0	165.0	120.0
161	14	153	150.0	236.0	120.0
162	13	14	150.0	475.0	120.0
163	13	146	150.0	35.0	120.0
164	146	147	150.0	137.0	120.0
167	11	137	150.0	663.0	120.0
168	14	152	100.0	66.0	120.0
170	33	152	100.0	150.0	120.0
175	56	68	100.0	165.0	120.0
176	68	136	44.0	726.0	130.0
177	136	137	44.0	512.0	130.0
178	137	187	140.0	277.0	130.0
182	71	124	225.0	400.0	120.0
183	15	124	225.0	441.0	120.0
184	15	16	150.0	177.0	120.0
185	16	121	100.0	286.0	120.0
186	120	121	75.0	1,210.0	120.0
187	16	125	100.0	850.0	120.0
191	122	209	225.0	120.0	120.0
193	125	126	100.0	396.0	120.0
194	126	128	65.0	668.0	130.0
195	126	127	65.0	1,047.0	130.0
196	128	129	65.0	90.0	130.0
197	129	130	44.0	60.0	130.0
198	130	131	37.0	88.0	130.0
199	62	520	100.0	569.0	120.0
200	41	42	100.0	237.0	120.0
201	30	113	150.0	250.0	120.0
203	5	36	150.0	105.0	120.0
179	187	300	150.0	500.0	120.0
250	136	301	65.0	215.0	130.0
209	160	300	150.0	152.0	120.0
213	62	524	97.0	334.0	130.0
214	30	503	100.0	334.0	120.0
215	112	511	75.0	132.0	120.0
216	500	501	140.0	100.0	130.0
217	154	501	65.0	104.0	130.0
218	186	501	140.0	221.0	130.0

110	118	503	75.0	167.0	120.0
300	215	301	100.0	554.0	120.0
208	215	300	100.0	250.0	120.0
17	205	527	100.0	250.0	120.0
172	15	153	150.0	577.0	120.0
302	10	70	150.0	480.0	120.0
304	24	25	100.0	55.0	120.0
305	55	172	100.0	50.0	120.0
306	20	172	100.0	50.0	120.0
307	23	25	100.0	75.0	120.0
308	40	178	150.0	150.0	120.0
77	39	40	100.0	180.0	120.0
78	40	189	100.0	60.0	120.0
79	100	101	44.0	450.0	130.0
309	41	42	150.0	150.0	120.0
310	119	521	65.0	350.0	130.0
311	521	522	65.0	350.0	130.0
313	33	35	100.0	150.0	120.0
301	11	523	150.0	120.0	120.0
314	59	523	100.0	180.0	120.0
315	502	524	75.0	150.0	120.0
317	524	600	97.0	450.0	130.0
319	525	526	75.0	210.0	120.0
321	527	528	65.0	480.0	130.0
322	134	528	65.0	200.0	130.0
11	165	601	65.0	75.0	130.0
324	188	527	65.0	50.0	130.0
325	122	123	140.0	160.0	130.0
327	56	59	140.0	352.0	130.0
328	1	49	158.0	264.0	130.0
329	206	527	150.0	215.0	120.0
330	156	541	100.0	931.0	120.0
331	112	540	97.0	434.0	130.0
601	91	139	150.0	162.0	120.0
602	91	161	65.0	225.0	130.0
603	70	93	150.0	662.0	120.0
605	93	132	150.0	616.0	120.0
606	93	185	150.0	300.0	120.0
607	56	602	200.0	1,000.0	120.0
212	22	54	150.0	275.0	120.0
610	122	160	225.0	931.0	120.0
611	91	92	150.0	228.0	120.0
612	92	135	100.0	690.0	120.0
613	604	610	97.0	200.0	130.0
614	105	612	44.0	250.0	130.0
616	174	542	97.0	569.0	130.0
701	15	606	250.0	500.0	120.0
702	169	603	55.0	50.0	130.0
703	15	153	140.0	577.0	130.0
705	16	125	65.0	850.0	130.0
713	102	103	198.0	350.0	130.0
714	103	106	198.0	400.0	130.0
715	28	106	198.0	250.0	130.0
716	28	107	198.0	40.0	130.0
717	107	108	198.0	200.0	130.0
718	108	109	198.0	120.0	130.0
719	109	511	198.0	400.0	130.0
720	112	511	198.0	132.0	130.0
731	113	114	140.0	265.0	130.0
732	114	117	140.0	500.0	130.0
741	179	208	140.0	104.0	130.0
751	610	611	97.0	630.0	130.0
752	611	612	65.0	610.0	130.0
761	50	542	97.0	1,044.0	130.0
762	68	542	97.0	165.0	130.0
771	101	102	140.0	120.0	130.0
772	100	101	140.0	450.0	130.0
773	41	100	140.0	120.0	130.0
781	5	6	250.0	221.0	120.0
782	6	27	250.0	150.0	120.0
783	27	181	250.0	1,106.0	120.0
784	102	181	250.0	92.0	120.0
791	151	186	140.0	450.0	130.0
792	13	151	140.0	35.0	130.0
793	13	14	140.0	475.0	130.0

794	14	153	140.0	236.0	130.0
795	154	501	140.0	104.0	130.0
796	153	154	140.0	165.0	130.0

Net Work Analysis   Distribution Main   C

Node No.	Elevation of Pipe (MSL)	Demand (cum/d)	Dynamic Pressure (MSL)	Dynamic Pressure (m)	Static Pressure (m)			Leakage (cum/d)
1	1,881.7	90.3	1,924.9	43.2	109.3	0.0	0.0	25.2
2	1,885.1	51.8	1,926.2	41.1	105.9	0.0	0.0	23.8
4	1,881.8	56.2	1,925.5	43.6	109.2	0.0	0.0	25.5
5	1,881.3	29.6	1,925.4	44.1	109.7	0.0	0.0	25.7
6	1,883.7	56.2	1,925.3	41.6	107.3	0.0	0.0	24.1
9	1,881.2	98.4	1,924.0	42.8	109.8	0.0	0.0	24.9
10	1,903.4	18.5	1,941.0	37.6	87.6	0.0	0.0	21.6
11	1,902.1	63.6	1,946.6	44.5	88.9	0.0	0.0	26.0
12	1,880.5	48.8	1,919.2	38.6	110.5	0.0	0.0	22.3
13	1,874.2	37.7	1,919.2	45.0	116.8	0.0	0.0	26.3
14	1,865.6	48.8	1,919.2	53.6	125.4	0.0	0.0	31.9
15	1,860.5	45.1	1,919.7	59.2	130.5	0.0	0.0	35.6
16	1,860.5	62.9	1,919.5	59.0	130.5	0.0	0.0	35.5
18	1,885.1	79.2	1,924.0	38.9	105.9	0.0	0.0	22.4
19	1,885.8	62.9	1,924.0	38.2	105.2	0.0	0.0	22.0
22	1,889.4	58.5	1,924.1	34.7	101.6	0.0	0.0	19.8
23	1,887.3	60.7	1,923.9	36.6	103.7	0.0	0.0	21.0
24	1,887.7	86.6	1,923.9	36.2	103.3	0.0	0.0	20.7
25	1,887.0	37.7	1,923.9	36.9	104.0	0.0	0.0	21.2
27	1,882.3	55.5	1,925.2	42.9	108.7	0.0	0.0	25.0
28	1,879.2	19.2	1,924.1	44.9	111.8	0.0	0.0	26.3
29	1,892.4	9.6	1,923.9	31.5	98.6	0.0	0.0	17.8
30	1,882.6	59.2	1,924.0	41.4	108.4	0.0	0.0	24.0
31	1,882.0	68.8	1,925.8	43.8	109.0	0.0	0.0	25.6
36	1,889.3	37.7	1,925.3	36.0	101.7	0.0	0.0	20.6
37	1,891.4	34.8	1,925.3	33.9	99.6	0.0	0.0	19.3
38	1,893.9	31.1	1,925.3	31.4	97.1	0.0	0.0	17.7
39	1,914.9	37.0	1,930.0	15.1	76.1	0.0	0.0	7.9
41	1,899.2	32.6	1,924.6	25.4	91.8	0.0	0.0	14.0
42	1,896.1	28.1	1,924.6	28.4	94.9	0.0	0.0	15.9
43	1,894.8	29.6	1,924.5	29.7	96.2	0.0	0.0	16.7
44	1,893.4	40.0	1,924.5	31.1	97.6	0.0	0.0	17.6
45	1,884.9	49.6	1,925.3	40.4	106.1	0.0	0.0	23.4
46	1,878.2	94.0	1,925.4	47.2	112.8	0.0	0.0	27.7
47	1,880.7	26.6	1,925.3	44.6	110.3	0.0	0.0	26.1
48	1,880.2	74.7	1,924.8	44.6	110.8	0.0	0.0	26.1
49	1,881.1	118.4	1,924.8	43.7	109.9	0.0	0.0	25.5
50	1,886.3	106.6	1,943.2	56.9	104.7	0.0	0.0	34.1
51	1,895.4	34.8	1,924.1	28.7	95.6	0.0	0.0	16.0
52	1,889.1	71.8	1,923.9	34.8	101.9	0.0	0.0	19.8
55	1,886.2	65.9	1,923.9	37.7	104.8	0.0	0.0	21.7
56	1,902.7	36.3	1,947.3	44.6	88.3	0.0	0.0	26.1
57	1,884.1	68.8	1,923.9	39.8	106.9	0.0	0.0	23.0
58	1,890.9	88.1	1,923.9	33.0	100.1	0.0	0.0	18.7
60	1,889.9	74.0	1,923.9	34.0	101.1	0.0	0.0	19.3
61	1,885.4	37.0	1,925.0	39.6	105.6	0.0	0.0	22.9
62	1,890.2	56.2	1,941.6	51.4	100.8	0.0	0.0	30.5
63	1,878.7	28.1	1,925.8	47.1	112.3	0.0	0.0	27.7
64	1,876.5	32.6	1,925.8	49.3	114.5	0.0	0.0	29.1
66	1,910.0	29.6	1,942.0	32.0	81.0	0.0	0.0	18.1
67	1,921.5	28.1	1,943.4	21.9	69.5	0.0	0.0	11.9
68	1,918.6	31.1	1,946.5	27.9	72.4	0.0	0.0	15.6
69	1,879.5	37.0	1,925.4	45.9	111.5	0.0	0.0	26.9
70	1,904.5	97.7	1,941.0	36.5	86.5	0.0	0.0	20.9
71	1,894.5	64.4	1,919.7	25.2	96.5	0.0	0.0	13.9
100	1,896.6	24.4	1,924.6	28.0	94.4	0.0	0.0	15.6
101	1,885.9	18.5	1,924.7	38.8	105.1	0.0	0.0	22.4
102	1,876.7	27.4	1,924.7	48.0	114.3	0.0	0.0	28.3
103	1,883.1	37.0	1,924.5	41.4	107.9	0.0	0.0	24.0
104	1,916.3	14.1	1,929.3	12.9	74.7	0.0	0.0	6.7
105	1,903.9	12.6	1,929.4	25.5	87.1	0.0	0.0	14.1
106	1,881.3	31.8	1,924.3	43.0	109.7	0.0	0.0	25.0
107	1,880.1	23.7	1,924.1	44.0	110.9	0.0	0.0	25.7
108	1,884.1	22.2	1,924.1	40.0	106.9	0.0	0.0	23.1
109	1,884.6	14.8	1,924.0	39.4	106.4	0.0	0.0	22.8
112	1,900.7	0.0	1,923.9	23.2	90.3	0.0	0.0	12.7
113	1,878.5	21.5	1,924.1	45.6	112.5	0.0	0.0	26.7
114	1,897.3	42.2	1,924.1	26.8	93.7	0.0	0.0	14.9
117	1,907.5	43.7	1,924.0	16.5	83.5	0.0	0.0	8.8
118	1,889.0	27.4	1,923.2	34.2	102.0	0.0	0.0	19.5
119	1,889.1	47.4	1,922.6	33.5	101.9	0.0	0.0	19.1
120	1,871.2	83.6	1,917.8	46.6	119.8	0.0	0.0	27.4
121	1,862.6	80.7	1,919.2	56.6	128.4	0.0	0.0	33.9
122	1,950.0	65.9	1,946.4	-3.6	41.0	0.0	0.0	0.0
123	1,927.3	48.1	1,946.4	19.1	63.7	0.0	0.0	10.3
124	1,879.6	50.3	1,919.7	40.1	111.4	0.0	0.0	23.2
125	1,886.2	79.9	1,918.5	32.3	104.8	0.0	0.0	18.3

Net Work Analysis Distribution Main C

Node No.	Elevation of Pipe (MSL)	Demand (cum/d)	Dynamic Pressure (MSL)	Dynamic Pressure (m)	Static Pressure (m)			Leakage (cum/d)
126	1,894.1	79.2	1,918.1	24.0	96.9	0.0	0.0	13.2
127	1,874.9	40.0	1,917.6	42.7	116.1	0.0	0.0	24.8
128	1,896.4	28.1	1,917.7	21.3	94.6	0.0	0.0	11.6
129	1,896.0	5.9	1,917.7	21.7	95.0	0.0	0.0	11.8
130	1,886.4	5.2	1,917.7	31.3	104.6	0.0	0.0	17.7
131	1,875.8	3.0	1,917.7	41.9	115.2	0.0	0.0	24.4
132	1,886.8	37.7	1,941.2	54.4	104.2	0.0	0.0	32.4
133	1,898.7	13.3	1,941.0	42.3	92.3	0.0	0.0	24.6
134	1,924.5	40.0	1,942.0	17.5	66.5	0.0	0.0	9.3
135	1,915.7	42.9	1,941.9	26.2	75.3	0.0	0.0	14.5
136	1,944.8	52.5	1,946.2	1.4	46.2	0.0	0.0	0.6
137	1,905.0	87.3	1,946.4	41.4	86.0	0.0	0.0	24.1
139	1,905.8	122.1	1,940.6	34.8	85.2	0.0	0.0	19.9
140	1,899.4	22.9	1,924.1	24.7	91.6	0.0	0.0	13.6
141	1,890.2	73.3	1,923.8	33.6	100.8	0.0	0.0	19.1
142	1,883.9	76.2	1,923.8	39.9	107.1	0.0	0.0	23.1
143	1,888.7	81.4	1,923.8	35.1	102.3	0.0	0.0	20.0
144	1,907.4	28.9	1,941.0	33.6	83.6	0.0	0.0	19.1
145	1,909.3	4.4	1,941.0	31.6	81.7	0.0	0.0	17.9
146	1,876.5	40.0	1,919.2	42.7	114.5	0.0	0.0	24.8
147	1,878.9	72.5	1,919.2	40.3	112.1	0.0	0.0	23.3
148	1,889.6	46.6	1,925.0	35.4	101.4	0.0	0.0	20.3
149	1,901.1	20.7	1,925.3	24.2	89.9	0.0	0.0	13.3
150	1,899.4	87.3	1,919.1	19.7	91.6	0.0	0.0	10.6
151	1,874.4	56.2	1,919.2	44.8	116.6	0.0	0.0	26.2
152	1,865.9	48.8	1,919.2	53.3	125.1	0.0	0.0	31.7
153	1,862.7	52.5	1,919.3	56.6	128.3	0.0	0.0	33.9
154	1,864.7	48.8	1,919.2	54.5	126.3	0.0	0.0	32.5
155	1,867.6	16.3	1,919.2	51.6	123.4	0.0	0.0	30.6
156	1,884.8	29.6	1,926.1	41.3	106.2	0.0	0.0	23.9
157	1,881.9	17.8	1,925.9	44.0	109.1	0.0	0.0	25.7
158	1,880.3	17.8	1,925.8	45.5	110.7	0.0	0.0	26.7
160	1,903.2	14.1	1,946.4	43.2	87.8	0.0	0.0	25.2
161	1,905.3	8.1	1,940.6	35.3	85.7	0.0	0.0	20.2
162	1,891.8	28.1	1,924.1	32.3	99.2	0.0	0.0	18.3
163	1,899.3	5.2	1,924.1	24.8	91.7	0.0	0.0	13.6
164	1,919.8	3.0	1,942.0	22.2	71.2	0.0	0.0	12.1
165	1,962.5	74.7	1,990.9	28.4	28.5	0.0	0.0	15.9
166	1,899.0	13.3	1,925.8	26.8	92.0	0.0	0.0	14.9
169	1,917.8	16.3	1,980.0	62.2	73.2	0.0	0.0	37.6
170	1,893.3	9.6	1,925.8	32.5	97.7	0.0	0.0	18.4
171	1,909.7	14.1	1,924.9	15.2	81.3	0.0	0.0	8.0
21	1,885.1	71.8	1,923.9	38.8	105.9	0.0	0.0	22.4
20	1,885.9	61.4	1,923.9	38.0	105.1	0.0	0.0	21.9
174	1,902.4	77.0	1,945.7	43.3	88.6	0.0	0.0	25.2
53	1,895.7	71.8	1,923.9	28.2	95.3	0.0	0.0	15.7
176	1,895.0	17.0	1,924.5	29.5	96.0	0.0	0.0	16.6
177	1,897.3	17.0	1,924.5	27.2	93.7	0.0	0.0	15.1
178	1,912.8	40.7	1,929.9	17.1	78.2	0.0	0.0	9.1
179	1,917.5	18.5	1,930.0	12.5	73.5	0.0	0.0	6.4
181	1,881.0	59.2	1,924.7	43.7	110.0	0.0	0.0	25.5
182	1,891.9	9.6	1,924.1	32.1	99.1	0.0	0.0	18.2
183	1,899.2	8.9	1,924.0	24.8	91.8	0.0	0.0	13.7
185	1,902.8	48.8	1,941.1	38.3	88.2	0.0	0.0	22.0
186	1,885.4	48.8	1,919.2	33.8	105.6	0.0	0.0	19.2
187	1,903.2	56.2	1,946.4	43.2	87.8	0.0	0.0	25.2
188	1,931.7	5.9	1,943.5	11.8	59.3	0.0	0.0	6.1
189	1,921.8	21.5	1,929.9	8.1	69.2	0.0	0.0	4.0
300	1,903.6	34.8	1,946.4	42.8	87.4	0.0	0.0	24.9
301	1,951.4	56.2	1,946.3	-5.1	39.6	0.0	0.0	0.0
59	1,900.0	90.3	1,947.2	47.2	91.0	0.0	0.0	27.7
500	1,892.8	18.5	1,919.2	26.4	98.2	0.0	0.0	14.7
501	1,886.6	56.2	1,919.2	32.6	104.4	0.0	0.0	18.5
502	1,885.6	59.2	1,942.9	57.3	105.4	0.0	0.0	34.4
503	1,884.2	56.2	1,923.6	39.4	106.8	0.0	0.0	22.7
510	1,914.5	37.7	1,940.6	26.1	76.5	0.0	0.0	14.5
511	1,892.1	14.8	1,924.0	31.9	98.9	0.0	0.0	18.0
520	1,913.6	46.6	1,941.6	28.0	77.4	0.0	0.0	15.6
304	1,900.4	51.8	1,938.5	38.1	90.6	0.0	0.0	21.9
172	1,886.0	37.7	1,923.9	37.9	105.0	0.0	0.0	21.8
173	1,916.0	37.7	1,929.0	13.0	75.0	0.0	0.0	6.7
521	1,886.0	37.7	1,922.0	36.0	105.0	0.0	0.0	20.6
522	1,880.0	37.7	1,921.8	41.9	111.0	0.0	0.0	24.3
523	1,903.0	37.7	1,946.6	43.6	88.0	0.0	0.0	25.4
524	1,887.0	37.7	1,943.0	56.0	104.0	0.0	0.0	33.5
525	1,881.0	37.7	1,923.8	42.9	110.0	0.0	0.0	24.9
526	1,882.0	37.7	1,923.9	41.9	109.0	0.0	0.0	24.4

Net Work Analysis

Distribution Main C

Node No.	Elevation of Pipe (MSL)	Demand (cum/d)	Dynamic Pressure (MSL)	Dynamic Pressure (m)	Static Pressure (m)			Leakage (cum/d)
527	1,931.0	22.2	1,943.8	12.8	60.0	0.0	0.0	6.6
528	1,943.0	22.2	1,942.4	-0.6	48.0	0.0	0.0	0.0
33	1,867.0	37.7	1,919.1	52.1	124.0	0.0	0.0	31.0
35	1,870.0	45.1	1,919.1	49.1	121.0	0.0	0.0	29.0
40	1,920.0	29.6	1,929.9	9.9	71.0	0.0	0.0	5.0
54	1,886.0	37.7	1,923.9	37.9	105.0	0.0	0.0	21.8
91	1,899.4	0.0	1,940.7	41.3	91.6	0.0	0.0	23.9
92	1,895.4	0.0	1,940.7	45.3	95.6	0.0	0.0	26.5
93	1,882.0	0.0	1,941.1	59.0	109.0	0.0	0.0	35.5
540	1,930.0	513.6	1,935.0	5.0	61.0	0.0	0.0	2.3
541	1,980.0	686.7	1,985.0	5.0	11.0	0.0	0.0	2.4
542	1,889.1	0.0	1,945.8	56.7	101.9	0.0	0.0	34.0
610	1,900.0	0.0	1,930.0	30.0	91.0	0.0	0.0	16.9
611	1,884.6	0.0	1,930.0	45.4	106.4	0.0	0.0	26.6
612	1,881.3	0.0	1,929.8	48.5	109.7	0.0	0.0	28.6
205	1,947.0	-37.7	1,943.8	-3.2	44.0	0.0	0.0	0.0
206	1,947.0	-215.3	1,943.8	-3.2	44.0	0.0	0.0	0.0
215	1,947.0	-145.8	1,946.5	-0.5	44.0	0.0	0.0	0.0
209	1,947.0	-60.7	1,946.4	-0.6	44.0	0.0	0.0	0.0