CHAPTER 6 - CONCLUSIONS & RECOMMENDATIONS

Overall system operation and reliability is excellent. Storage capacity meets the system requirements and the District has enough supply to meet system demands.

RECOMMENDED IMPROVEMENTS

Several areas need improvements in order to meet the minimum pressure criteria established in Chapter 5. Primarily, these improvements are related to fire flow requirements throughout the District.

The area around Larson Circle was identified as having low system pressures and is currently augmented with a small pressure reducing valve. While this solution works well under low flow conditions it will not maintain pressures under fire flow conditions. It is recommended that this area be converted to Zone I using a new 12" pipeline in Taft Avenue from Leatrice Drive.

Recommended improvements also included replacing all 4-inch diameter pipes as well as increasing the pipeline in Taft Avenue where the Smith Pump Station discharges to Zone II.

Prioritizing pipeline improvements is useful tool for budgeting and scheduling construction activities. Improvements necessary to provide fire flow are all critical and should be given top priority. However, the number of fire flow improvements may dictate that not all improvements can be executed at one time.

Table 6-1 summarizes the recommended pipeline improvements described above and groups these improvements into one of four priority groups. The first group represents the most critical fire flow improvements including the pipelines necessary to provide fire flow for the schools. The second group includes the remaining fire flow improvements. The third group contains critical operational improvements and the final group includes lower priority operational improvements.

Table 6.1 Pipeline Improvements

Pipe	Street Name	Length (ft)	Diameter (in)	Unit Cost* ($/LF)	Total*
Priority 1					
P-1064	Santiago Boulevard	1,200	12	140	$168,000
P-1066	Santiago Boulevard	900	12	140	$126,000
Priority 2					
P-4	Jocotal Avenue	300	8	110	$33,000
P-6	Timothy Drive	560	8	110	$61,600
P-204	Radec Court	390	8	110	$42,900
P-316	Dodson Way	710	8	110	$78,100
P-384	Phelan Drive	210	8	110	$23,100
P-388	Phelan Drive	360	8	110	$39,600
P-398	Sharon Lane	380	8	110	$41,800
P-470	Via Corta	560	8	110	$61,600
P-476	Old Lamplighter Circle	420	8	110	$46,200
P-492	Windsor Drive	690	8	110	$75,900
P-548	Christine Circle	440	8	110	$48,400
P-658	Hillside Avenue	260	8	110	$28,600
P-660	Hillside Avenue	130	8	110	$14,300
P-662	Lakeside Avenue	340	8	110	$37,400
P-664	Lakeside Avenue	70	8	110	$7,700
P-802	Ragan Circle	380	8	110	$41,800
P-1068	Taft Avenue	800	8	110	$88,000
Priority 3					
P-290	Nichols Avenue	490	8	110	$53,900
P-370	Villa Park High School	500	8	110	$55,000
P-374	Villa Park High School	140	8	110	$15,400
P-594	Ludwig Street	710	8	110	$78,100
P-790	Verde Lomas	470	8	110	$51,700
P-796	Briley Way	100	8	110	$11,000
P-296	Serrano Avenue	140	12	140	$19,600
P-298	Serrano Avenue	510	12	140	$71,400
P-300	Serrano Avenue	400	12	140	$56,000
P-772	Taft Avenue	130	12	140	$18,200
P-776	Taft Avenue	140	12	140	$19,600
P-1022	Taft Avenue	260	12	140	$36,400
Priority 4					
P-84	Collins Avenue	460	8	110	$50,600
P-220	Stratford Circle	230	8	110	$25,300
P-303	Santiago Boulevard	920	8	110	$101,200
P-308	Meats Avenue	1,100	8	110	$121,000
P-324	Florence Circle	90	8	110	$9,900
P-330	Mary Circle	150	8	110	$16,500
P-334	Sandra Circle	215	8	110	$23,650
P-350	Haninger Way	200	8	110	$22,000
P-622	Workman Circle	230	8	110	$25,300

P-626	Knuth Circle	165	8	110	$18,150
P-816	Villa Woods Drive	180	8	110	$19,800
P-956	Hunting Circle	130	8	110	$14,300
P-960	San Ramon Circle	240	8	110	$26,400
P-1070	Meats Avenue	780	8	110	$85,800
Subtotals					
Priority 1		**2,100**	**-**	**-**	**$294,000**
Priority 2		**7,000**	**-**	**-**	**$770,000**
Priority 3		**3,990**	**-**	**-**	**$486,300**
Priority 4		**5,090**	**-**	**-**	**$559,900**
				Total =	**$2,110,200**

*Based in ENRCCI June 2006 of 7700

Figure 6-1 on the following page presents a graphical depiction of the recommended replacements. The priority groups are colored coded for clarity with red and orange representing the fire flow improvements and green and blue representing operational improvements.

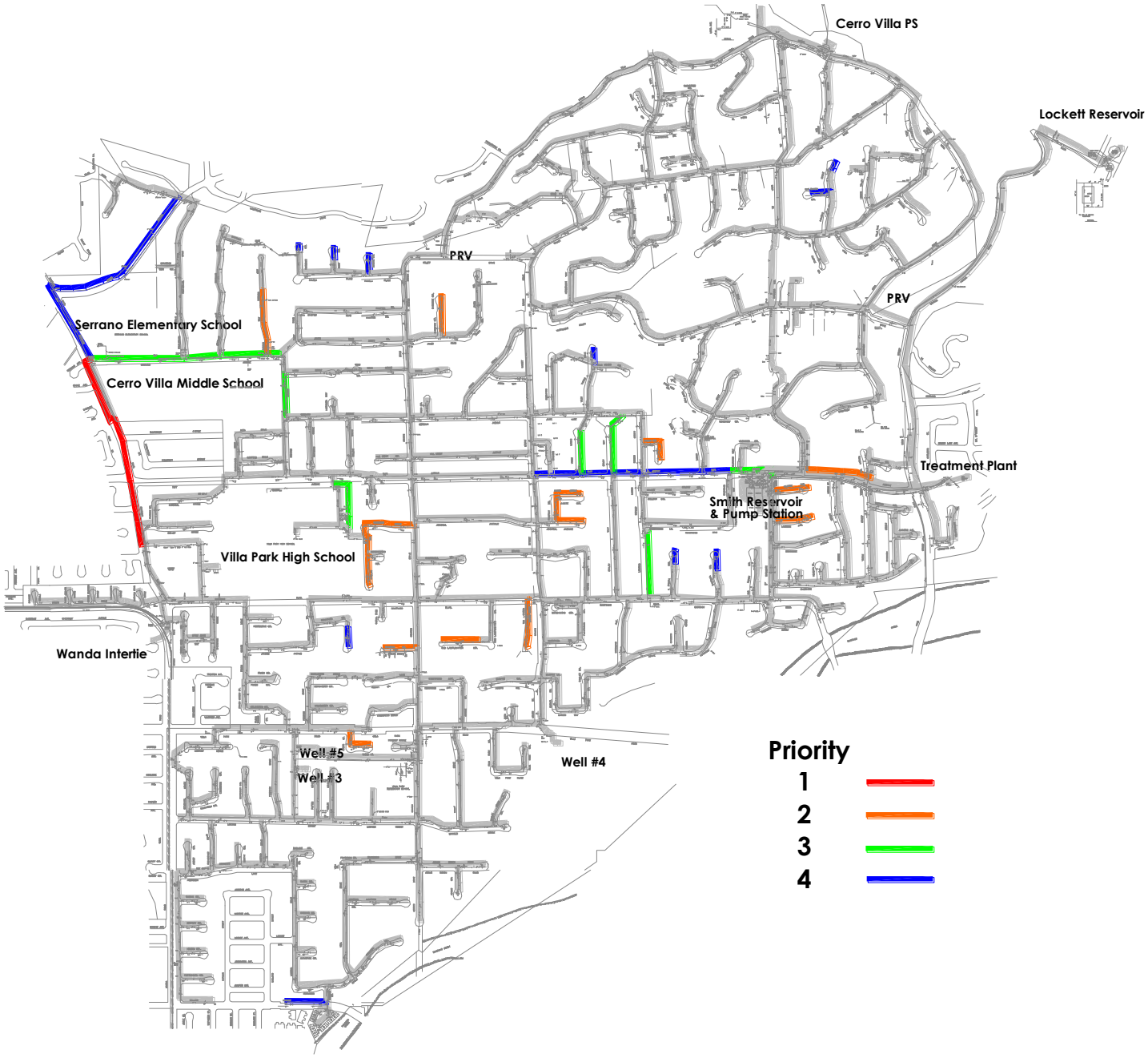

Figure 6-1 – Recommended Pipeline Improvements

AGING PIPELINES

Pipelines do not have an indefinite life span. Estimates for the useful age of a pipeline are variable but it can be assumed to be no more than 50 years. In order to determine the precise replacements necessary on an annual basis the age and condition of each pipe would have to be reviewed. A less intensive analysis can be done by performing an inventory of the system and assuming a pipe life span to determine the amount of pipe replacement necessary annually.

Table 6-2 provides an inventory and present worth of the District's pipelines.

Table 6.2 Pipeline Present Worth

Diameter	Length (ft)	Unit* ($/ft)	Present Worth*
2	1,410	50	$70,500
4	8,420	60	$505,200
6	24,750	80	$1,980,000
8	138,460	110	$15,230,600
10	31,220	120	$3,746,400
12	9,630	140	$1,348,200
14	2,270	150	$340,500
18	3,820	170	$649,400
Totals =	**220,000**	**-**	**$23,870,800**

*Based in ENRCCI June 2006 of 7700

In order to replace the entire distribution system over 50 years, approximately $480,000 of pipelines must be replaced per year in today's dollars.

WATER QUALITY

The ongoing water quality study being performed by Dr. Issam Najm of Water Quality Solutions was not complete during preparation of this report. Recommendations regarding system water quality will be included as part of Dr. Najm's report.

HYDRAULIC MODEL MAPS

-HYDRAULIC MODEL PIPE NUMBERS

-HYDRAULIC MODEL NODE NUMBERS

HYDRAULIC MODEL OUTPUT

CALIBRATION DATA