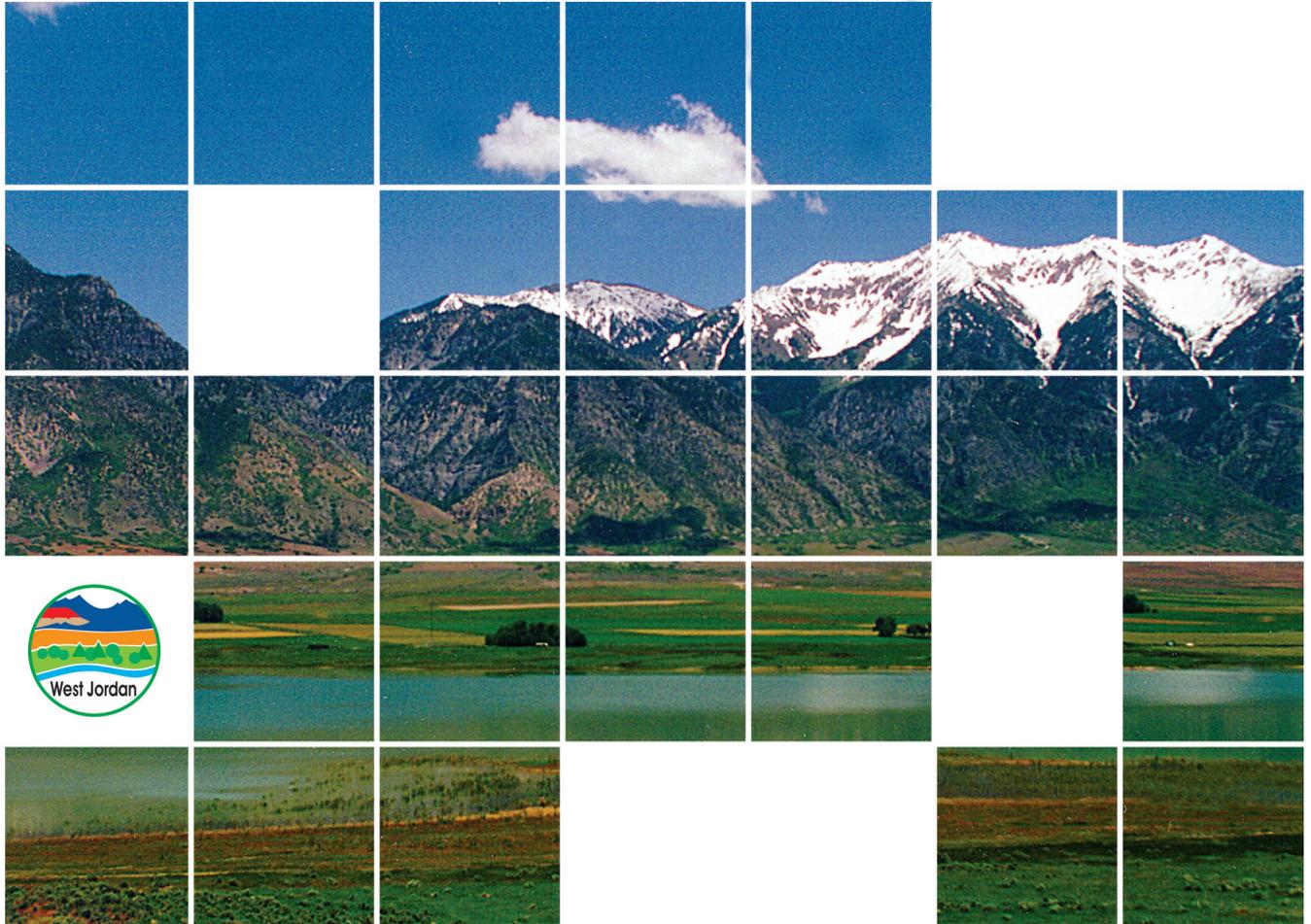


CITY OF WEST JORDAN



Final
2006 Water Master Plan Update
Technical Memorandum

City of West Jordan
September 2007

**CITY OF WEST JORDAN, UTAH
FINAL**

**2006 MASTER PLAN UPDATE
TECHNICAL MEMORANDUM**

September 2007

MWH Project No.: 1710655

**Prepared For:
City of West Jordan
8000 South Redwood Road
West Jordan, Utah**

**Prepared By:
MWH Americas, Inc.
10619 South Jordan Gateway, Suite 100
Salt Lake City, Utah 84106**

OBJECTIVE STATEMENT

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The attached technical memorandum is an addendum to the City of West Jordan's 2003 Water Master Plan Report. The technical memorandum provides a summary of the future model development and analysis. It also provides a summary of the proposed projects that will be constructed by the City of West Jordan as part of the Capital Improvement Plan (CIP) and those projects that will be constructed by developers.

The memorandum was developed to revise and update the recommendations of the City of West Jordan's October 2003 Water Master Plan. The City of West Jordan's Model and the Master Plan Figures were updated to reflect the completion of Capital Improvement (CIP) projects proposed in the 2003 Water Master Plan Report, to modify timing and alignment of CIP projects, and to add new CIP projects as required to accommodate future growth. The alignments of the pipe lines on the West Side were changed to display the pipe along the new road alignments. The demands in the model were also updated to incorporate new planned developments and the West Jordan West Side Specific Landuse Plan. Proposed pipelines and facilities were then reevaluated and sized so that the recommended system would meet the future demands in compliance with the City's hydraulic criteria.

CIP project costs were developed for each project. These costs were used to determine the impact fees and the user fees that will be required to fund each project. Project costs that are eligible for impact fee funds include projects that are required to meet growth related issues such as providing increased water storage, additional water and transmission or distribution due to increase in demand, and increased fire flows. Project costs not eligible for impact fee funding include projects that are required to correct a deficiency in the existing system such as high velocities in transmission mains or distribution pipes, deficient water storage for current uses, or replacement of aging infrastructure.

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PLATE NO.	TITLE
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LIST OF ACRONYMS

CIP	Capital Improvement Plan
JVWCD	Jordan Valley Water Conservancy District
PRV	pressure reducing valve

**2006 MASTER PLAN UPDATE
TECHNICAL MEMORANDUM**



MWH
MONTGOMERY WATSON HARZA

To:	Roger Payne, Engineering Manager for Utilities City of West Jordan	Date:	September 20, 2007
Subject:	2006 Water Master Plan Update Technical Memorandum		
From:	Gracelyn NeVille	Job No:	1710655

PURPOSE

The 2006 Water Master Plan Update Technical Memorandum is an addendum to the City of West Jordan’s 2003 Water Master Plan Update Report. The purpose of this memorandum is to provide a summary of the future model development and analysis for the 2006 Water Master Plan Update. The memo also summarizes proposed projects that will be constructed by the City of West Jordan as part of their Capital Improvement Plan (CIP) and those projects that will be constructed as part of proposed developments. Figure 1 shows the projects that will be included in the City’s CIP. Figure 2 shows the projects that will be constructed as part of proposed developments. Cost tables are provided for the CIP Projects.

The City of West Jordan’s model and the Master Plan Figures were updated to reflect the completion of CIP projects proposed in the 2003 Water Master Plan Report, to modify timing and alignment of CIP projects, and to add new CIP projects as required to accommodate future growth.. The alignments of the pipe lines on the West Side were changed to display the pipe along the new road alignments. The demands in the model were also updated to incorporate new planned developments and the West Jordan West Side Specific Landuse Plan. Proposed pipelines and facilities were then reevaluated and sized so that the recommended system would meet the future demands in compliance with the City’s hydraulic criteria.

2006 HYDRAULIC MODEL UPDATE

The City requested that several infrastructure updates be made to the hydraulic model presented in the 2003 Water Master Plan Update Report. The demands were also updated according to the West Jordan West Side Specific Landuse Plan.

A 2006 scenario was added to the model to update the existing system model to include current demands, operations, and facilities constructed and abandoned since the completion of the 2003 Water Master Plan Update. The infrastructure updates were made based on construction drawings, GIS files, and markups provided by the City and Jordan Valley Water Conservancy District (JVWCD). The 2006 demand scenario includes the new developments that have come on line since 2003.

There is also a 2010 Scenario and a Buildout Scenario that show the future pipes and future demands in the system. The infrastructure in these Scenarios was modified to reflect the proposed road alignments in the West Side. The City provided the road alignments and new development locations. The proposed pipelines were also revised to show dual pipes in collector and arterial roads. The model was modified to show the

JVWCD construction of Zone D 30-inch transmission piping along 10200 South, a new pump station at the Existing Zone C tank at 10200 South and 7000 West, and new storage facilities at 10200 South and 8000 West. The Pressure Zone 7 transmission piping and storage locations were modified to show Zone 7 having two supply sources and to reflect the new road alignments.

The updates included analyzing the effects of abandoning JVWCD 16” transmission main along 9000 South and replacing the 16” transmission main along 3200 West with a 30” transmission main. The recommendations show new distribution system pipe that will be required, locations of two new meter stations, and the abandonment of four meter stations.

Future Demand Updates

Future demands were updated based on the West Jordan West Side Specific Area Plan or proposed development acreage and landuse provided by the City. Table 1 shows the unit use rates that were used to update the demand allocation in the 2006, 2010, and buildout scenarios. The unit use rates were taken from the 2003 Master Plan Update Report.

Table 1. Unit Water Use Rates

Land use Type	Unit Rate (gpad)	Unit Rate (gpm/ac)
Residential		
Rural	1032	0.72
Low Density	1873	1.30
Medium Density	2809	1.95
High Density /Multi-family Residential	3517	2.44
Commercial	1325	0.92
Professional Office	1325	0.92
Public	3705	2.57
Enterprise Park	1281	0.89
Industrial	1281	0.89
Open Space	0	0
Park	n/a	1.24
Vacant	0	0

A “polygon processing” procedure was used to combine the land use data, the unit area water use rates, and the model nodes into an average day demand for the West Side Area nodes. This procedure is described in Section 3 of the Master Plan Update Report. It involves four steps:

- Allocate a service area (service area polygon) to each West Side Demand Node.
- Identify the types of land use within each service area polygon
- Identify the area of each type of land use within each service area polygon
- The area of each landuse type is multiplied by the unit use rate for each land use and allocated to the corresponding node.

The average demand was then multiplied by 2.4 to assign the maximum day demand to each node in the model.

The 2006 demand scenario includes the new developments that have come one line since 2003 as shown in the City’s GIS files. The 2006 demand was allocated based on acreages of the developments and the landuse of the developments. Table 2 shows the developments on the West Side that were added to the 2006 scenario. There were also a few small developments throughout the existing system shown in the GIS files that were added to the 2006 Demand. The demands were allocated to the model nodes using unit area water use rates. The gross acreage of each development was multiplied by the applicable unit water use factor and assigned to the corresponding nodes.

Table 2. 2006 West Side Developments

Bloomfield Farms
Bloomfield Heights
Cayden Meadows I
Copperfield I
Maples I
Oaks
Siena Vista I
Sycamores
Existing Jr. High School
Existing Elementary School
Central Village Commercial
Oaks Commercial

The 2010 Scenario demands include all the 2006 demands plus any new developments that have been approved by the City. The demands were again allocated to the model using unit water use rates. The gross acreage of each development was multiplied by the applicable unit water use factor and assigned to the corresponding nodes. Table 3 shows the developments on the West Side that were added to the 2010 scenario.

Table 3. 2010 West Side Developments

Bloomfield Estates
Copperfield II
Discovery
Maples II
Parkcrest
Perry Bawden
Serengeti
Siena Vista II & III
Three Forks

The buildout demands were updated based on the West Jordan West Side Specific Area Plan. A summary of the 2010 and buildout maximum day demand projections by pressure zone are shown in Table 4.

Table 4. 2010 and Buildout Maximum Day Demand (mgd)

Zone	2010 MDD (mgd)	Buildout MDD (mgd)
1	15.56	18.14
2	8.98	9.85
3	10.36	13.39
3a	0.34	0.37
4	5.95	9.38
	10.26	12.93
6	2.88	9.04
7	0.00	4.28
Total	54.34	77.38

Future Supply and Operations

The transmission system along 7800 South will continue to be the source of much of the water serving future demands in the growing western parts of the City. During the analysis it was noted that two pumps must operate at the U-111 4 MG tank and booster pump station located at SR-111 and 7800 South and operational changes at the Airport Tank and Grizzly Tank are required to increase supply to the Zone 6 tank located in the foothills above the KUCC Railroad at the west end of 7800 South. The U-111 pumps currently have two large pumps and one jockey pump. The jockey pump will need to be replaced with a larger pump by the end of 2007. Also, it needs to be verified that the Grizzly pumps and Airport pumps can provide adequate flow up to the U-111 tank.

There were also a few zone boundary changes recommended in the 2003 Master Plan Update. These boundary changes have not been modified in this update.

Aside from Zones 1 and 5, every pressure zone in the buildout system is planned to operate independently from the pressure zone above (i.e. no flow from PRVs under normal conditions, this would be accomplished by setting the existing PRVs to 40 psi). At the request of the City, Zone 5 will be served through PRVS from Zone 6, with pressure settings ranging from 50 psi to 67 psi. Zone 1 relies on PRVs to provide a small portion of maximum day and peak hour demands. As a result of this self-sufficiency built into the infrastructure of each pressure zone, the buildout system utilizes less JVWCD transmission facilities capacity for peaking than the existing system. Furthermore, all pressure zones have multiple sources and tank locations, which increases reliability and decreases the need for large diameter piping. In this update, an additional tank and transmission main were added in Pressure Zone 7 so that this zone has multiple sources.

JVWCD is planning on replacing their 16” pipe along 3200 West with a 30” or a 36” pipe North of 9000 South. The JVWCD will then abandon their transmission main along 9000 South from 3200 West to 1300 West. JVWCD is not planning on completing this project until the City replaces the street in 3200 West. At this time four meters will be abandoned. Three will be abandoned along 9000 South at 3200 West, 2700 West, and Redwood Road. One will be abandoned at 3200 West and 8600 South. Two new meters will be added at 8750 South and 3200 West and at 9000 south and 1300 West.

JVWCD is also constructing an RO Plant at 1300 West and 8200 South by the spring of 2009. This plant will connect to a 24” pipeline that runs from 1300 West to 3200 West along 7800 South and will supplement flow to the existing West Jordan meter at 7800 South and 3200 West.

Three new sources are anticipated that will deliver water to the new Zone 6 tanks: Kennecott membrane treatment plant, a JVWCD connection at 10200 South and 8000 West (JVWCD Zone D Tanks), and a JVWCD connection at 10200 South and SR-111. These sources will serve Zone 5, 6 & 7.

JVWCD plans on completing the construction of their booster pump station at their Zone C Tank and completing one Zone D tank by the summer of 2008. The Zone C Tank booster pump station will supplement the flow from the KUCC Treatment Plant to their New Zone D Tank on 8000 West. The City plans on constructing two 3-MG tanks at the same site as the Zone D tanks. One storage tank will be constructed by the end of 2009. West Jordan City is planning on using the storage at the JVWCD Zone D tank until their own tank(s) are built on this site.

When the City completes the construction of the first 3-MG tank at New Bingham Highway and 8000 South, the City will be converting Pressure Zone 5a to Zone 5. The City will move their connection at the Zone C Tank to the discharge side of the booster pump station (Zone 6). A PRV will be constructed along 10200 South to feed Zone 5 from Zone 6. The link along Wells Park Road from 6000 W and 6300 West will be closed. Then the temporary PRV along New Bingham Highway and 6400 West will be removed. In order to better serve the fire flow needs of Bagely Industrial Park, a separate pressure zone, Zone 5a, was recommended in the 2003 Master Plan Update. The new pressure zone would be served from the Dannon PRV. The area lies between 5200 West and 6000 West, and between 9200 South and 10200 South.

Future Storage

A storage analysis was completed for the buildout system to identify additional storage required to meet the system criteria. The results of this analysis and the proposed storage volumes are shown in Table 5. Storage for Zone 5 has been included in Zone 6, the amount of proposed storage has been rounded to the next higher million gallon. Some excess capacity has been added, at the City’s request, to provide operational flexibility and reliability, particularly for the 7800 South Transmission System.

This update only reevaluated storage required for Pressure Zones 5, 6, & 7. All other pressure zone storage requirements were taken from the 2003 Master Plan.

Table 5. Future Storage Requirements Table

Zone	Indoor Component (Mgal)	Irrigation Component (Mgal)	Fire Component (Mgal)	Total Required (Mgal)	Total Existing (Mgal)	Deficiency (Mgal)	New (Mgal)
2010 Plan					(as of 2005)		
1	4.79	3.59	1.2	9.58	4.5	5.08	4
2	2.65	1.92	1.2	5.77	6	-0.23	0
3/3a	2.83	2.74	1.44	7.01	6	1.01	0
4	1.07	0.95	0.96	2.98	7	-4.02	0
5 & 6	1.56	1.48	0.96	4.00	3	1.00	3
Total	12.90	10.68	5.76	29.34	26.50	2.84	7.00
Buildout Plan					(as of 2010)		
1	5.36	4.28	1.2	10.84	8.5	2.34	2*
2	2.87	2.14	1.2	6.21	6	0.21	7
3/3a	3.8	3.33	1.44	8.57	6	2.57	3
4	2.74	2.52	0.96	6.22	7	-0.78	7
5 & 6	5.42	4.99	1.20	11.62	6	5.62	6
7	0.92	1.77	0.96	3.65	0	3.65	4
Total	21.11	19.03	6.96	47.10	33.50	13.60	29.00

*Existing 2 MG tank will be abandoned and a 4 MG tank will be constructed.

The only West Jordan City storage currently available to Pressure Zone 5 and 6 is the 3-MG water tank located in the foothills above the KUCC Railroad at the west end of 7800 South. Table 5 shows the storage required to accommodate the 2010 developments is 4 MG. Therefore, one of the 3 MG proposed storage tanks located at 10200 South and 8000 West should be constructed to accommodate the 2010 developments.

The City plans on constructing two 3-MG tanks at this site with one storage tank being constructed by the end of 2009. The JVWCD is currently constructing one of several storage tanks (Zone D tanks) at this location and it will be completed in the summer of 2008. West Jordan City is planning on using the storage at the JVWCD Zone D tank until their own tank(s) are built on this site. Once one of the West Jordan tanks is constructed, West Jordan will have adequate storage in their own water storage tanks to meet 2010 storage requirements

The other tank that is proposed by the year 2010 is a 4 MG tank to be constructed at the Airport Tank Site. Zone 3/3a will still have a storage deficiency in the year 2010 that will be corrected later.

BUILDOUT SYSTEM AND MODEL RESULTS

The 2010 scenario in the master plan update hydraulic model was originally used to develop the CIP for the 2010 planning horizon, and size the proposed facilities in the 2003 Master Plan Update and at the beginning of the 2006 Update. The system was analyzed and adjusted to make sure the 2010 CIP Projects were adequate to meet the 2010 demands. Figures were then completed for the 2010 CIP Projects and Buildout

Projects. However, the City requested that the infrastructure no longer be split up into 2010 improvements and buildout improvements. Instead one figure was created to include all CIP Projects that the City will be responsible for funding and one figure was created to show the transmission mains developers will be responsible for constructing and funding.

The approximate JWCD maximum day delivery for buildout conditions are shown in Table 6. These are the flows with the current settings in the master plan model. Several supply sources are interconnected. Therefore, the flow from each source can be changed by changing the pressure settings at the supply source and PRV settings throughout the system. New meters are located at 9000 South and 1300 West, 8750 South and 3200 West, 10200 South and New Bingham Highway, and 10200 South SR-111. It should also be noted that in 2010 the flow from the meter at 10200 South and New Bingham Highway will have a maximum day flow of 1200 gpm.

Table 6. Buildout JWCD Supply Assumptions

Approximate Location of Delivery Points	Model ID	City Pressure Zone	Buildout Maximum Day Flow (gpm)
6600 South 1700 West	JV-66-RW	1	1,730
7000 South 3600 West	JV-70-36	1	2,000
7800 South 3600 West	JV78-36	1	3,800
Future 7800 South 3600 West	Fut-JV-78-36	1	17,300
9000 South and 1300 West	NEW1300WMETER	1	1,980
9000 South 3600 West	JV-90-36 Pipe	1	-
7800 South 3200 West	JV78-32-Z1	1	-
6200 South 3600 West	JV62-36	2	970
7000 South 3200 West	JV-70-32	2	3,890
7800 South 3200 West	JV78-32	2	400
8750 South and 3200 West	NEW3200WMETER	2	1,090
10200 South 5600 West	JV-102-56	3	2,620
10200 South 6950 West	JV-102-70	5	4,700
Copperton Tanks	NEWZONE6METER	6	2,800
10200 South SR-111	NEW10200SMETER	6	-
Total JWCD Assumed Supply			42,650

System pressures were reanalyzed with the modified demand and pipe alignments for Pressure Zones 5, 6, and 7. All areas will meet the city’s requirements for operational and fire flow pressures and velocities with the proposed CIP and developer projects for these pressure zones.

RECOMMENDED FACILITIES AND IMPROVEMENTS

The CIP Projects that the City will be responsible for funding are grouped into projects and identified by number on Figure 1 and a summary of the projects is provided in Table 9. At the beginning of this update, the same numbering system was used where possible as the 2003 Master Plan Update. However, City priorities have changed since the 2003 update. Therefore, the City reevaluated each project and reprioritized the projects. The project numbering was provided by the City. The projects are split into four categories and then numbered in order of priority. The four categories are distribution pipelines, transmission pipelines, pump stations, and storage reservoirs.

The 2003 Master Plan CIP only had projects that were to be constructed by the year 2010. The City determined it would be more useful to have a map and a project summary that showed all projects that would be part of their CIP out to Buildout conditions and then a plan that showed what projects developers would be responsible for constructing. Table 7 shows the original project number used in the 2003 Master Plan. It also shows that several projects were added to the CIP so that the CIP contained projects that would be required for the City to construct out to Buildout conditions.

Table 7. Project Number Comparison to 2003 Master Plan Project

New Project No.	2003 Project No.
D-1	19
D-2	24
D-3	16
D-4	17
D-5	
D-6	
D-7	
D-8	10
D-9	2
D-10	6
D-11	11
D-12	11
D-13	13
D-14	
D-15	15
D-16	
D-17	
T-1	14
T-2	3
T-3	12
T-4	23
T-5	18
T-6	
T-7	
T-8	
P-1	
P-2	
P-3	
P-4	
S-1	8
S-2	
S-3	
S-4	
S-5	
S-6	
S-7	
S-8	
S-9	
S-10	
S-11	
S-12	

There are currently thirteen pumps in the West Jordan System. It is proposed that seven new pumps will be added to the system in order to supply adequate flow to the upper zones during Buildout conditions. The recommended pump station improvements are listed in Table 8.

Table 8. Recommended Pump Stations/Improvements

Model ID	Location	Zone	Actual HP ^(a)	Assumed No. of Duty Pumps	Actual HP ^(a) per pump	Project No.
FP-Z4-Z6-78	U-111 Tank	6	315	1	350	P-1
FP-Z4-Z6-NB	Terminal Tank	6	600	2	300	P-2
FP-Z6-Z7-78	Jordan Hills Tanks	7	200	2	100	P-3
FP-Z6-Z7-NB	Copperton Tanks	7	200	2	100	P-4

Notes:

(a) Assumes overall efficiency of 80%.

Pressure reducing valves (PRVs) play a critical role in the City’s distribution system because of excess supply in upper pressure zones and deficit supply in lower pressure zones. PRVs allow flow between upper and lower pressure zones while maintaining appropriate pressures within each zone. There are currently thirty PRVs in the City’s distribution system. It is proposed that the City install 10 new PRVs and developers install 4 new PRVs. Eight PRVs will be removed as part of CIP or developer projects. Table 9 lists the location and project of each of these PRV changes.

Table 9. PRV Improvements

Zone Boundary	Approximate Location	Model ID	Dia. (inch)	Setting (psi)	HGL (ft)	Project No.
Additional PRVs						
Z2 to Z1	7000 S, 2700 W	F-PRV-70-27	8	58	4580	D-11
Z2 to Z1	7800 S, 2700 W	F-PRV-78-27	8	58	4580	D-10
Z2 to Z1	9000 S, 2200 W	F-PRV-90-22	10	60	4584	D-15
Z3 to Z2	Old Bingham, 4000 W	F-PRV-OB-40	12	60	4750	D-8
Z3 to Z2	7800 S, 4000 W	F-PRV-78-40	12	31	4751	D-8
Z3 to Z2	8100 S, 3700 W	F-PRV-81-37	8	70	4705	D-8
Z3 to Z3B	Old Bingham, Bangerter	F-PRV-OBH-BANG	12	75	4721	D-7
Z5 to Z4	9300 S, 6000 W	F-PRV-93-60	8	68	5080	T-5
Z5 to Z4	8600 S, 6200 W	F-PRV-86-62	12	40	5015	Developer
Z5 to Z4	7000 S, 6000 W	F-PRV-70-60	12	45	5010	Developer
Z6 to Z5	New Bingham, 6600 W	F-PRV-NB-66	20	45	5160	T-6
Z6 to Z5	10200 S, 6600 W	F-PRV-102-66	16	50	5181	T-4
Z6 to Z5	8600 S, SR-111	F-PRV-86-US111	10	50	5183	Developer
Z6 to Z5	7000 S, 6400 W	F-PRV-70-64	10	54	5196	Developer
Z6 to Z5	9000 S, 6400 W	F-PRV-90-64	12	50	5159	Developer
PRVs to be removed						
Z2 to Z1	9000 S, 2600 W	PRV-90-26	10	52	4586	D-15
Z2 to Z1	8200 S, 2900 W	PRV-82-29	6	50	4570	D-10
Z2 to Z1	7800 S, 2900 W	PRV-78-29	6	50	4568	D-10
Z2 to Z1	7400 S, 3000 W	PRV-74-30	6	51	4570	D-11
Z2 to Z1	6600 S, 2900 W	PRV-66-29	6	50	4556	D-12
Z2 to Z1	7000 S, 3200 W	PRV-70-32	10	50	4576	D-12
Z3 to Z2	8500 S, 4000 W	PRV-85-40N	6	44	4705	D-8
Z5 to 5A	New Bingham, 6400 W	PRV-TEMP-5A	10	70	5130	Developer

Water is supplied to the distribution system from four city owned wells and from twelve connections to JWCD facilities. As part of the CIP, four new meters will be installed and four existing meters will be removed. Table 10 lists the location and project number for each meter station change.

Table 10. Meter Station Improvements

Model ID	Approximate Location	Zone	Project No.
Additional Meters			
NEW1300WMETER	9000 S and 1300 W	1	D-5
NEW3200WMETER	8750 S and 3200 W	2	D-5
NEW10200SMETER	10200 S SR-111	6	T-7
NEWZONE6METER	Copperton Tanks	6	S-2
Meters to be Removed			
JV90-17	9000 S and 1700 W	1	D-5
JV-90-27	9000 S and 2700 W	2	D-5
JV-88-32	8800 S and 3200 W	2	D-5
JV90-32	9000 S and 3200 W	2	D-5

There are currently eight storage locations within the distribution system and a total of ten existing tanks. The tanks set the hydraulic grade within each pressure zone, and provide emergency and fire storage. The tanks also provide operational storage to assist in meeting fluctuating demands throughout the day. The City has completed one storage tank (The Airport No. 3 Storage Tank) since the 2003 Master Plan and plans on constructing eleven new storage tanks throughout the system to meet buildout demands. A summary of the additional storage tanks are shown in Table 11.

Table 11. Recommended Storage Tanks

Tank	Zone	Tank Vol (gal)	High Water level (ft)	Project No.
Airport No. 3	1	4,000,000	4,592	S-1
Airport No. 1&2 Replacement	1	4,000,000	4,592	S-10
Old Bingham No. 2	2	3,000,000	4,720	S-3
Grizzly No. 2	2	4,000,000	4,720	S-8
Zone 3 Old Bingham	3	3,000,000	4,910	S-9
U-111 No. 2	4	4,000,000	5,050	S-5
Terminal No. 2	4	3,000,000	5,050	S-4
Copperton No. 1	6	3,000,000	5,350	S-2
Copperton No. 2	6	3,000,000	5,350	S-7
Jordan Hills No. 2	6	3,000,000	5,355	S-6
Zone 7 South	7	2,000,000	5,475	S-11
Zone 7 North	7	2,000,000	5,475	S-12
Total Recommended Storage:		38,000,000		

Cost Opinions for Recommended Improvements

The costs developed in this Study are for planning purposes only and are based on unit costs developed from recent planning projects and construction bid information. The opinions include a twenty percent markup for engineering and administration and a twenty-five percent contingency for unknowns such as bidding environment and site specific conditions which are unknown at this planning stage. Guidelines published by American Association of Cost Engineers suggest that the budget level cost opinions developed during the planning phase have a “reconnaissance grade” level of accuracy, which may vary between -30 and +50 percent of actual project cost. The unit costs are shown in Table 12.

The unit cost per linear feet of pipe is about \$9 per diameter inch without contingency or engineering fees. It is about \$13 per diameter inch with the twenty percent markup for engineering and administration and a twenty-five percent contingency for unknowns. The unit cost per linear feet of pipe includes cost of pipe, fittings, valves, excavation, pipe installation, pipe testing, backfilling, compaction, surface restoration.

The unit cost for PRVs include cost of concrete structure, valves, miscellaneous piping, excavation, compaction, backfilling, and surface restoration. The unit cost for pump includes pumps, controls, valves, miscellaneous piping, control panel, and electrical work. The pump station structure includes cost of concrete structure, excavation, backfilling, compaction, and surface restoration. It does not include cost for land acquisition. Land values included in the project costs are based on 2006 land cost and are shown in the appropriate tables.

The connection to the existing system, disconnecting piping, metered delivery points, abandoning meter delivery point, abandoning PRVs, and well drilling are all inclusive. The unit cost for the Canal Crossing and U-111 Crossing is for open cut installation. The unit cost for storage tank includes the cost of the concrete structure, excavation, backfilling, compaction, and surface restoration. It does not include cost for land acquisition. Land values included in the project costs are based on 2006 land cost.

Table 12. Unit Cost Table

Description	Unit	Unit Cost
Pipelines by Diameter (inch)		
6-inch pipeline	LF	\$54
8-inch pipeline	LF	\$72
10-inch pipeline	LF	\$90
12-inch pipeline	LF	\$108
14-inch pipeline	LF	\$125
16-inch pipeline	LF	\$144
18-inch pipeline	LF	\$162
20-inch pipeline	LF	\$180
24-inch pipeline	LF	\$215
30-inch pipeline	LF	\$270
36-inch pipeline	LF	\$325
42-inch pipeline	LF	\$375
48-inch pipeline	LF	\$430
PRV's		
6-inch PRV	LS	\$20,000
8-inch PRV	LS	\$25,000
10-inch PRV	LS	\$30,000
12-inch PRV	LS	\$40,000
16-inch PRV	LS	\$75,000
20-inch PRV	LS	\$100,000
24-inch PRV	LS	\$150,000
Pumping Stations		
Pump (Operational & 1 Standby)	HP	\$1,500
Pump Station Structure, Site Plan	SF	\$150
Miscellaneous		
Connection to Ex. System	EA	\$5,750
Disconnect Piping	EA	\$5,750
Metered Delivery Point	EA	\$160,100
Abandon Metered Delivery Point	EA	\$6,000
Abandon PRV	EA	\$4,500
Canal Crossing	EA	\$25,000
U-111 Crossing	Ea	\$25,000
Storage Tank	MG	\$600,000
Well Drilling	LF	\$300
Contingency		25%
Engineering/Legal/Admin. (After Contingency added in)		20%

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The future infrastructure was categorized into a CIP project or developer funded projects. MWH coordinated with the City of West Jordan's Utility Engineer to determine which projects would be part of the CIP and which projects would be funded by developers. The CIP projects included the following:

- All storage tanks.
- All pumps and pump stations.
- Projects to correct existing deficiencies or to improve existing conditions.
- Transmission mains 16-inch and larger.

In cases where the City requests that a pipe size be increased beyond the size required to serve a specific development the City may be responsible to pay the difference in cost for the increased size. This increased cost would be eligible for reimbursement from Impact Fees because the increase would be justified to serve new growth within the City.

A summary of the budget level cost opinions for the CIP Projects are presented in Table 13. The details of the cost estimate are provided in Appendix A. The project numbers correspond to the numbers shown on Figure 1. Right-of-Way and property acquisition costs were not originally included in the cost opinions. The City calculated the right-of-way and property acquisition costs based on 2006 land cost where possible and the costs were included in the 2006 Master Plan Updates Cost Opinions.

Table 13. Summary of CIP Project Cost Opinions

Project	Cost
Distribution Pipelines	
Project No. D-1 (2700 West Piping 90 So. To 94 So.)	\$408,750
Project No. D-2 (7400 S. 1900 W.- Drake Farm)	\$190,050
Project No. D-3 (7800 S Piping West of 4000 W. Phase 1)	\$ 601,200
Project No. D-4 (Airport Road North Piping)	\$474,330
Project No. D-5 (New JWCD Meters & 90 th So.Pipeline)	\$1,287,900
Project No. D-6 (Wells Park to Axel Park 10-inch waterline)	\$257,280
Project No. D-7 (OBH Feed to Zone 3b)	\$754,890
Project No. D-8 (Pzone 2/3 Boundary Relocation On 4000 W.)	\$1,672,695
Project No. D-9 (Pzone 3/4 Boundary Relocation)	\$612,750
Project No. D-10 (6-Pzone 1/2 Boundary Relocation [South])	\$587,475
Project No. D-11 (Pzone 1/2 Boundary Relocation Phase 1 [North])	\$1,513,305
Project No. D-12 (Pzone 1/2 Boundary Relocation Phase 2 [North])	\$155,490
Project No. D-13 (Replace No. Redwood Rd Connect. Pipe to JWCD)	\$259,170
Project No. D-14 (Zone 6 Piping [Maples Area] from SR-111 to 6800 W.)	\$180,870
Project No. D-15 (9000S. & 2200 W. Loop, Relocate PRV)	\$504,405
Project No. D-16 (10-inch Ranch Road Waterline)	\$261,600
Project No. D-17 (6000 W. Piping from Well 6 to Wells Park Road)	\$384,990
Project No. D-18 (Farm Road Pipe Replacement)	\$231,060

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Project	Cost
Transmission Pipelines	
Project No. T-1 (7800 So. Phase 3 Reconstruction Trans. Pipes)	\$2,590,725
Project No. T-2 (Connect Airport Pump Station to Pzone 3)	\$241,890
Project No. T-3 (Zone 6 Transmission Piping [NBH & SR-111])	\$4,143,465
Project No. T-4 (10200 South Zone 5 PRV & Reconnect)	\$159,750
Project No. T-5 (Wells 4 & 6 Looping, 90 So. To Dannon Way)	\$632,985
Project No. T-6 (9400 S Piping from SR-111 to NBH)	\$2,872,680
Project No. T-7 (16-inch pipe on SR-111, 10200 S. to NBH)	\$1,106,280
Project No. T-8 (16-inch Pipe on SR-111, 7500 S. to 7000 S.)	\$706,305
Project No. T-9 (16-inch Pipe along New Bingham Hwy from Terminal Tank to 9000 S.)	\$1,133,940
Pump Stations & Equipment	
Project No. P-1 (SR-111 Pump Addition)	\$262,500
Project No. P-2 (Terminal Reservoir Pump Station)	\$1,732,500
Project No. P-3 (Pump Station & Piping to Zone 7 North Tank)	\$1,389,420
Project No. P-4 (Pump Station & Piping to Zone South 7 Tank)	\$1,414,200
Storage Reservoirs	
Project No. S-1 (Zone 1- New Airport 4 MG Tank)	\$3,750,000
Project No. S-2 (Zone 6 - Copperton 3 MG Tank)	\$3,615,150
Project No. S-3 (Zone 3 - OBH 3 MG Tank)	\$3,487,500
Project No. S-4 (Zone 4 - NBH Terminal 3 MG Tank 2)	\$3,150,000
Project No. S-5 (Zone 4 - SR-111 4 MG Tank 2)	\$3,680,625
Project No. S-6 (Zone 6 - Jordan Hill 3 MG Tank)	\$2,700,000
Project No. S-7 (Zone 6 - COPPERTON 3 MG TANK 2)	\$2,700,000
Project No. S-8 (Zone 2 - Grizzly 4 MG Tank 2)	\$3,600,000
Project No. S-9 (Zone 2 – Old Bingham Highway 2 MG Tank 2)	\$ 1,800,000
Project No. S-10 (Zone 1 - Airport Tank Replacement)	\$3,900,000
Project No. S-11 (Zone 7 - South 2 MG Tank)	\$ 2,475,000
Project No. S-12 (Zone 7 - North 2 MG Tank)	\$ 2,475,000
Total CIP Plan	\$66,058,125

* Includes 25% contingency as well as 20% engineering and construction management services.

The CIP project cost were used to determine the impact fees and user fees. Project costs that are eligible for impact fee funds include projects that are required to meet growth related issues such as providing increased water storage, additional water and transmission or distribution due to increase in demand, and increased fire flows. Project costs not eligible for impact fee funding include projects that are required to correct a deficiency in the existing system such as high velocities in transmission mains or distribution pipes, deficient water storage for current uses, or replacement of aging infrastructure. Table 14 lists each CIP project and the approximate cost that can be

funded by impact fees (new growth) and the cost that will be funded by user fees. The following criteria was used to determine the percentage of the total cost that can be applied to an impact fee due to new growth.

1. The cost for additional storage was based on the existing storage table found in the West Jordan's 2003 Water Master Plan Update Report. The existing storage deficiencies were compared to the future storage requirements to determine what percentage would be user fee funded.
2. A small portion of the Zone 6 Copperton Reservoir No. 1 was allocated to user fee funded based on the existing demands in Zone 5a that are borrowing storage from JWCD tank.
3. All future pump stations are driven by new growth.
4. The transmission mains were first evaluated by comparing the existing scenario (2001) to the buildout scenario and determining the increase demand in the area each project served.
5. The flow rates during buildout conditions through each transmission or distribution project were compared to the flow rate that would occur if the pipe in the project used a maximum design velocity of 5 fps. This comparison helped determine the extra capacity in the pipe that is available for additional growth not already allocated.

Table 14. Water 2030 Capital Facilities Plan

CIP No.	Project Description	Location	Total Cost	Impact Fee Funded	Impact Fee Allocation	Funded by Other Sources Funded	User Fee Allocation
Distribution Pipelines				%	\$\$	%	\$\$
D-1	2700 West Piping 90 So. To 94 So.	27 W from 90 S to 94 S	\$408,750	0%	\$0	100%	\$408,750
D-2	7400 S. 1900 W.- Drake Farm	74 S @ 19 W	\$190,050	10%	\$19,005	90%	\$171,045
D-3	7800 S Piping West of 4000 W. Phase 1	78 S from 40 W to 48 W	\$601,200	100%	\$601,200	0%	\$-
D-4	Airport Road North Piping	Around Airport	\$474,330	100%	\$474,330	0%	\$-
D-5	New JVWCD Meters & 90th So.Pipeline	90 S from 24 W to 27 W	\$1,287,900	30%	\$386,370	70%	\$901,530
D-6	Wells Park to Axel Park 10-inch waterline	56 W from 94 S to 98 S	\$257,280	100%	\$257,280	0%	\$-
D-7	OBH Feed to Zone 3	OBH from SR 111 to 68 W	\$754,890	100%	\$754,890	0%	\$-
D-8	Pzone 2/3 Boundary Relocation On 4000 W.	PZ 2 & 3 on 40 W	\$1,672,695	20%	\$334,539	80%	\$1,338,156
D-9	Pzone 3/4 Boundary Relocation	PZ 3 & 4	\$612,750	0%	\$0	100%	\$612,750
D-10	6-Pzone 1/2 Boundary Relocation (South)	PZ 1 & 2 82 S to 86 S	\$587,475	20%	\$117,495	80%	\$469,980
D-11	Pzone 1/2 Boundary Relocation Phase 1 (North)	27 W from 78 S to 70 S	\$1,513,305	20%	\$302,661	80%	\$1,210,644
D-12	Pzone 1/2 Boundary Relocation Phase 2 (North)	27 W from 70 S to 66 S	\$155,490	20%	\$31,098	80%	\$124,392
D-13	Replace No. Redwood Rd Connect. Pipe to JVWCD	N Redwood Road	\$259,170	20%	\$51,834	80%	\$207,336
D-14	Zone 6 Piping (Maples Area) from SR-111 to 6800 W.	SR 111 to 68 W	\$180,870	100%	\$180,870	0%	\$-
D-15	9000S. & 2200 W. Loop, Relocate PRV	90 S @ 22 W	\$504,405	80%	\$403,524	20%	\$100,881
D-16	10-inch Ranch Road Waterline	West of Grizzly Way at 80 S	\$261,600	100%	\$261,600	0%	\$-
D-17	6000 W. Piping from Well 6 to Wells Park Road	Wells Park Road to Dannon Way	\$384,990	100%	\$384,990	0%	\$-
D-18	Farm Road Pipe Replacement	Farm Road Near 4000 W	\$231,060	0%	\$0	100%	\$231,060
Transmission Pipelines							
T-1	7800 So. Phase 3 Reconstruction Trans. Pipes	78 S from 17 W to 27 W	\$2,590,725	20%	\$518,145	80%	\$2,072,580

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CIP No.	Project Description	Location	Total Cost	Impact Fee Funded	Impact Fee Allocation	Funded by Other Sources Funded	User Fee Allocation
T-2	Connect Airport Pump Station to Zone 3	78 S from 38 W to 40 W	\$241,890	10%	\$24,189	90%	\$217,701
T-3	Zone 6 Transmission Piping (NBH & SR111)	NBH @ 81 W	\$4,143,465	100%	\$4,143,465	0%	\$0
T-4	10200 South Zone 5 PRV & Reconnect	OBH @ 64 W	\$159,750	100%	\$159,750	0%	\$0
T-5	Wells 4 & 6 Looping, 90 So. To Dannon Way	NBH @ 60 W	\$632,985	60%	\$379,791	40%	\$253,194
T-6	9400 S Piping from SR-111 to NBH	94 S from SR-111 to NBH	\$2,872,680	100%	\$2,872,680	0%	\$0
T-7	16-inch pipe on SR-111, 10200 S. to NBH	SR 111 from 102 S to NBH	\$1,106,280	100%	\$1,106,280	0%	\$0
T-8	16-inch Pipe on SR-111, 7500 S. to 7000 S.	SR 111 from 7500 S to 7000 S	\$706,305	100%	\$706,305	0%	\$0
T-9	16-inch Pipe along New Bingham Hwy from Terminal Tank to 9000 S.	NBH from 67 W to 90 S	\$1,133,940	100%	\$1,133,940	0%	\$0
Pump Stations & Equipment							
P-1	SR-111 Pump Addition	78 S @ SR-111	\$262,500	100%	\$262,500	0%	\$0
P-2	Terminal Reservoir Pump Station	NBH @ 67 W	\$1,732,500	100%	\$1,732,500	0%	\$0
P-3	Pump Station & Piping to Zone 7 North Tank	76 S @ 76 W	\$1,389,420	100%	\$1,389,420	0%	\$0
P-4	Pump Station & Piping to Zone 7 South Tank	NBH @ 81 W	\$1,414,200	100%	\$1,414,200	0%	\$0
Storage Reservoirs							
S-1	Zone 1- New Airport 4 MG Tank	78 S @ 41 W	\$3,750,000	50%	\$1,875,000	50%	\$1,875,000
S-2	Zone 6 - Copperton 3 MG Tank	NBH @ 81 W	\$3,615,150	85%	\$3,072,878	15%	\$542,273
S-3	Zone 3 - OBH 3 MG Tank	OBH @ 56 W	\$3,487,500	100%	\$3,487,500	0%	\$0
S-4	Zone 4 - NBH Terminal 3 MG Tank 2	NBH @ 67 W	\$3,150,000	100%	\$3,150,000	0%	\$0
S-5	Zone 4 - SR-111 4 MG Tank 2	78 S @ SR-111	\$3,680,625	100%	\$3,680,625	0%	\$0
S-6	Zone 6 - Jordan Hill 3 MG Tank	76 S @ 76 W	\$2,700,000	100%	\$2,700,000	0%	\$0
S-7	Zone 6 - Copperton 3 MG Tank	NBH @ 81 W	\$2,700,000	100%	\$2,700,000	0%	\$0
S-8	Zone 2 - Grizzly 4 MG Tank	78 S @ 51 W	\$3,600,000	100%	\$3,600,000	0%	\$0
S-9	Zone 2 - Old Bingham Highway 2 MG Tank 2	OBH @ 45 W	\$1,800,000	85%	\$1,530,000	15%	\$270,000
S-10	Zone 1 - Airport Tank Replacement	78 S @ 41 W	\$3,900,000	100%	\$3,900,000	0%	\$0

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CIP No.	Project Description	Location	Total Cost	Impact Fee Funded	Impact Fee Allocation	Funded by Other Sources Funded	User Fee Allocation
S-11	Zone 7 - South 2 MG Tank	Approx. 90 S & 86 W	\$2,475,000	100%	\$2,475,000	0%	\$0
S-12	Zone 7 - North 2 MG Tank	Approx. 78 S & 86 W	\$2,475,000	100%	\$2,475,000	0%	\$-
Total CIP Plan			\$66,058,125		\$55,050,854		\$11,007,272

25% * Includes 25% contingency as well as 20% engineering and construction management services.

Developer funded projects are those projects, including the transmission mains that were 12-inch and smaller, that are required to meet the requirements at buildout conditions (year 2030) and are 100% growth related. They are also facilities that developers would be putting in with new development that is currently undefined. To anticipate the potential costs of these facilities an estimate of their costs were prepared. The transmission mains that the developers will construct are shown on Figure 2. The pipe improvements to be constructed by developers are not grouped into projects nor prioritized. Only pipes that would be located in planned streets are shown on the Figure. A summary of developer funded projects is shown in Table 15.

Table 15. Cost Opinion for the Transmission Mains Installed by Developers

Description	Unit	Quantity	Unit Cost	Total
8-inch pipeline	LF	33,700	\$72	\$2,426,400
10-inch pipeline	LF	62,400	\$90	\$5,616,000
12-inch pipeline	LF	129,200	\$108	\$13,953,600
16-inch pipeline	LF	5,200	\$144	\$748,800
Total LF	LF	230,500		
Subtotal Construction Cost				\$22,744,800
Contingency at 25 percent				\$5,686,200
Total Construction Cost				\$28,431,000
Engineering, Administration, Legal, etc. at 20 percent				\$5,686,200
Total Capital Cost				\$34,117,200

In many cases the developer would only be required by the City to install an 8-inch diameter pipe to meet the demand and fire flow requirements of an area. When the pipe will also serve as a transmission pipeline to transport water to adjoining areas and developments, the pipe size may be increased. When the pipe diameter is upsized, the City may choose to participate in the extra cost of upsizing pipes. This cost is usually limited to the difference in the material costs of the two pipe sizes. Table 16 presents the total estimated incremental cost that would be required from City funds for upsizing developer constructed pipes shown on Figure 2. These projects are due to new growth in the area. Therefore, “impact fees” can be used to fund the incremental costs of these projects.

Table 16. Incremental Cost to the City for Developer Constructed Mains

Description	Unit	Quantity	Unit Cost	Total
10-inch PRV	LS	2	\$30,000	\$60,000
12-inch PRV	LS	3	\$40,000	\$120,000
Abandon PRV	EA	1	\$4,500	\$4,500
10-inch pipeline	LF	62,400	\$18	\$1,123,200
12-inch pipeline	LF	129,200	\$36	\$ 4,651,200
16-inch pipeline	LF	5,200	\$72	\$374,400
Total LF	LF	196,800		
Subtotal Cost to the City				\$6,333,300
Contingency at 25 percent				\$1,583,325
Total Cost to the City				\$7,916,625

Impact fees can be used to fund the “impact fee” portions of the projects listed in Table 14 (\$55,050,854) and the incremental costs shown in Table 16 (\$7,916,625). The total cost that is attributable to new growth and therefore eligible for Impact Fee Funds is \$62,967,479.

APPENDIX A

Table 1
Opinion of Cost
Project No. D-1 (2700 West Piping 90 So. To 94 So.)
(10-inch waterline on 2700 W. to replace JWCD old steel pipeline)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF	2900	\$ 90	\$ 261,000
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	2900		\$ 261,000
Connection to Ex. System	EA	2	\$ 5,750	\$ 11,500
Disconnect Piping	EA		\$ 5,750	\$ -
Abandon PRV	EA		\$ 4,500	\$ -
Storage Tank	MG		\$ 600,000	\$ -
Canal Crossing	EA		\$ 25,000	\$ -
Subtotal				\$ 272,500
Subtotal Construction Cost				\$ 272,500
Contingency at 25 percent				\$ 68,125
Total Construction Cost				\$ 340,625
Engineering, Administration, Legal, etc. at 20 percent				\$ 68,125
Total Capital Cost				\$ 408,750

Table 2
Opinion of Cost
Project No. D-2 (7400 S. 1900 W.- Drake Farm)

(8-inch waterline through the Drake Farm to connect Executive Drive to Redwood Rd)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF	1600	\$ 72	\$ 115,200
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	1600		\$ 115,200
Connection to Ex. System	EA	2	\$ 5,750	\$ 11,500
Disconnect Piping	EA		\$ 5,750	\$ -
Pipeline Easement	LS		\$ -	\$ -
Storage Tank	MG		\$ 600,000	\$ -
Subtotal				\$ 126,700
Subtotal Construction Cost				\$ 126,700
Contingency at 25 percent				\$ 31,675
Total Construction Cost				\$ 158,375
Engineering, Administration, Legal, etc. at 20 percent				\$ 31,675
Total Capital Cost				\$ 190,050

Table 3
Opinion of Cost

Project No. D-3 (7800 S Piping West of 4000 W. Phase 1)

(16-inch waterline on 7800 So. 4000 W. to 4800 W. to complete 16" pipes on 7800 South)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF	2450	\$ 144	\$ 352,800
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	2450		\$ 352,800
Connection to Ex. System	EA	4	\$ 5,750	\$ 23,000
Disconnect Piping	EA		\$ 5,750	\$ -
Abandon PRV	EA		\$ 4,500	\$ -
Storage Tank	MG		\$ 600,000	\$ -
Canal Crossing	EA	1	\$ 25,000	\$ 25,000
Subtotal				\$ 400,800
Subtotal Construction Cost				\$ 400,800
Contingency at 25 percent				\$ 100,200
Total Construction Cost				\$ 501,000
Engineering, Administration, Legal, etc. at 20 percent				\$ 100,200
Total Capital Cost				\$ 601,200

Table 4
Opinion of Cost
Project No. D-4 (Airport Road North Piping)

(12-inch waterline on North end of Airort Rd to complete waterline loop North of Airport)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF	2590	\$ 108	\$ 279,720
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	2590		\$ 279,720
Connection to Ex. System	EA	2	\$ 5,750	\$ 11,500
Disconnect Piping	EA		\$ 5,750	\$ -
Abandon PRV	EA		\$ 4,500	\$ -
Storage Tank	MG		\$ 600,000	\$ -
Canal Crossing	EA	1	\$ 25,000	\$ 25,000
Subtotal				\$ 316,220
Subtotal Construction Cost				\$ 316,220
Contingency at 25 percent				\$ 79,055
Total Construction Cost				\$ 395,275
Engineering, Administration, Legal, etc. at 20 percent				\$ 79,055
Total Capital Cost				\$ 474,330

*Note- This project shows on development plans for 84 Lumber

Table 5
Opinion of Cost

Project No. D-5 (New JVCWD Meters & 90th So. Pipeline)

(Two new JVCWD meter stations will replace four meter stations along 3200 West & 9000 South. 12-inch pipeline on 9000 So. to replace the JVCWD Pipe)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA	2	\$ 160,100	\$ 320,200
Abandon Metered Delivery Point	EA	4	\$ 6,000	\$ 24,000
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ 344,200
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF	4550	\$ 108	\$ 491,400
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	4550		\$ 491,400
Connection to Ex. System	EA	4	\$ 5,750	\$ 23,000
Disconnect Piping	EA		\$ 5,750	\$ -
Abandon PRV	EA		\$ 4,500	\$ -
Storage Tank	MG		\$ 600,000	\$ -
Subtotal				\$ 514,400
Subtotal Construction Cost				\$ 858,600
Contingency at 25 percent				\$ 214,650
Total Construction Cost				\$ 1,073,250
Engineering, Administration, Legal, etc. at 20 percent				\$ 214,650
Total Capital Cost				\$ 1,287,900

Table 6
Opinion of Cost
Project No. D-6 (Wells Park to Axel Park 10-inch waterline)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF	510	\$ 72	\$ 36,720
10-inch pipeline	LF	1370	\$ 90	\$ 123,300
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	1880		\$ 160,020
Connection to Ex. System	EA	2	\$ 5,750	\$ 11,500
Disconnect Piping	EA		\$ 5,750	\$ -
Abandon PRV	EA		\$ 4,500	\$ -
Storage Tank	MG		\$ 600,000	\$ -
Canal Crossing	EA		\$ 25,000	\$ -
Subtotal				\$ 171,520
Subtotal Construction Cost				\$ 171,520
Contingency at 25 percent				\$ 42,880
Total Construction Cost				\$ 214,400
Engineering, Administration, Legal, etc. at 20 percent				\$ 42,880
Total Capital Cost				\$ 257,280

Table 7
Opinion of Cost
Project No. D-7 (OBH Feed to Zone 3b)
(12-inch pipe and PRV on OBH for second feed to Zone 3b)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS	1	\$ 40,000	\$ 40,000
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ 40,000
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF	3720	\$ 108	\$ 401,760
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	3720		\$ 401,760
Connection to Ex. System	EA	2	\$ 5,750	\$ 11,500
Disconnect Piping	EA		\$ 5,750	\$ -
Abandon PRV	EA		\$ 4,500	\$ -
Storage Tank	MG		\$ 600,000	\$ -
Bangeter Crossing	LS	1	\$ 50,000	\$ 50,000
Subtotal				\$ 463,260
Subtotal Construction Cost				\$ 503,260
Contingency at 25 percent				\$ 125,815
Total Construction Cost				\$ 629,075
Engineering, Administration, Legal, etc. at 20 percent				\$ 125,815
Total Capital Cost				\$ 754,890

Table 8
Opinion of Cost

Project No. D-8 (Pzone 2/3 Boundary Relocation On 4000 W.)

(12-inch waterline, install three PRV's, and abandon one PRV, to adjust pressure zone boundary along 4000 West)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS	1	\$ 25,000	\$ 25,000
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS	2	\$ 40,000	\$ 80,000
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ 105,000
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF	6220	\$ 108	\$ 671,760
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF	1480	\$ 144	\$ 213,120
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	7700		\$ 884,880
Connection to Ex. System	EA	15	\$ 5,750	\$ 86,250
Disconnect Piping	EA	6	\$ 5,750	\$ 34,500
Abandon PRV	EA	1	\$ 4,500	\$ 4,500
Storage Tank	MG		\$ 600,000	\$ -
Subtotal				\$ 1,010,130
Subtotal Construction Cost				\$ 1,115,130
Contingency at 25 percent				\$ 278,783
Total Construction Cost				\$ 1,393,913
Engineering, Administration, Legal, etc. at 20 percent				\$ 278,783
Total Capital Cost				\$ 1,672,695

Table 9
Opinion of Cost
Project No. D-9 (Pzone 3/4 Boundary Relocation)

(8-inch waterline between 90th So. & NBH to modify Pzone 3/4 boundary)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF	90	\$ 54	\$ 4,860
8-inch pipeline	LF	4670	\$ 72	\$ 336,240
10-inch pipeline	LF	110	\$ 90	\$ 9,900
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	4870		\$ 351,000
Connection to Ex. System	EA	10	\$ 5,750	\$ 57,500
Disconnect Piping	EA		\$ 5,750	\$ -
Abandon PRV	EA		\$ 4,500	\$ -
Storage Tank	MG		\$ 600,000	\$ -
Subtotal				\$ 408,500
Subtotal Construction Cost				\$ 408,500
Contingency at 25 percent				\$ 102,125
Total Construction Cost				\$ 510,625
Engineering, Administration, Legal, etc. at 20 percent				\$ 102,125
Total Capital Cost				\$ 612,750

**Table 10
Opinion of Cost**

Project No. D-10 (6-Pzone 1/2 Boundary Relocation (South))

(12-inch waterline and PRV on 2700 West to separate Zone Boundary 1/2)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS	1	\$ 40,000	\$ 40,000
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ 40,000
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF	2800	\$ 108	\$ 302,400
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	2800		\$ 302,400
Connection to Ex. System	EA	4	\$ 5,750	\$ 23,000
Disconnect Piping	EA	3	\$ 5,750	\$ 17,250
Abandon PRV	EA	2	\$ 4,500	\$ 9,000
Storage Tank	MG		\$ 600,000	\$ -
Subtotal				\$ 351,650
Subtotal Construction Cost				\$ 391,650
Contingency at 25 percent				\$ 97,913
Total Construction Cost				\$ 489,563
Engineering, Administration, Legal, etc. at 20 percent				\$ 97,913
Total Capital Cost				\$ 587,475

**Table 11
Opinion of Cost**

Project No. D-11 (Pzone 1/2 Boundary Relocation Phase 1 (North))

(12-inch waterline.install one PRV, & abandon one PRV on 2700 West to relocate pressure zone 1/2 boundary north of 7800 S.)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS	1	\$ 25,000	\$ 25,000
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ 25,000
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF	400	\$ 72	\$ 28,800
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF	7790	\$ 108	\$ 841,320
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	8190		\$ 870,120
Connection to Ex. System	EA	10	\$ 5,750	\$ 57,500
Disconnect Piping	EA	9	\$ 5,750	\$ 51,750
Abandon PRV	EA	1	\$ 4,500	\$ 4,500
Storage Tank	MG		\$ 600,000	\$ -
Subtotal				\$ 983,870
Subtotal Construction Cost				\$ 1,008,870
Contingency at 25 percent				\$ 252,218
Total Construction Cost				\$ 1,261,088
Engineering, Administration, Legal, etc. at 20 percent				\$ 252,218
Total Capital Cost				\$ 1,513,305

**Table 12
Opinion of Cost**

Project No. D-12 (Pzone 1/2 Boundary Relocation Phase 2 (North))

(12-inch waterline and abandon PRV's to relocate pressure Zone 1/2 boundary North Ph2)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF	770	\$ 108	\$ 83,160
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	770		\$ 83,160
Connection to Ex. System	EA	2	\$ 5,750	\$ 11,500
Disconnect Piping	EA		\$ 5,750	\$ -
Abandon PRV	EA	2	\$ 4,500	\$ 9,000
Storage Tank	MG		\$ 600,000	\$ -
Subtotal				\$ 103,660
Subtotal Construction Cost				\$ 103,660
Contingency at 25 percent				\$ 25,915
Total Construction Cost				\$ 129,575
Engineering, Administration, Legal, etc. at 20 percent				\$ 25,915
Total Capital Cost				\$ 155,490

**Table 13
Opinion of Cost**

Project No. D-13 (Replace No. Redwood Rd Connect. Pipe to JWCD)

(Enlarge pipe to JWCD meter, 12-inch pipe to 16-inch pipe, North end of Redwood Rd)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF	1120	\$ 144	\$ 161,280
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	1120		\$ 161,280
Connection to Ex. System	EA	2	\$ 5,750	\$ 11,500
Disconnect Piping	EA		\$ 5,750	\$ -
Abandon PRV	EA		\$ 4,500	\$ -
Storage Tank	MG		\$ 600,000	\$ -
Subtotal				\$ 172,780
Subtotal Construction Cost				\$ 172,780
Contingency at 25 percent				\$ 43,195
Total Construction Cost				\$ 215,975
Engineering, Administration, Legal, etc. at 20 percent				\$ 43,195
Total Capital Cost				\$ 259,170

Table 14
Opinion of Cost

Project No. D-14 (Zone 6 Piping (Maples Area) from SR-111 to 6800 W.)

(12-inch pipe from SR-111 to 7400 S. & 6800 W. to loop zone 6 feed to Maples)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF	1010	\$ 108	\$ 109,080
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	1010		\$ 109,080
Connection to Ex. System	EA	2	\$ 5,750	\$ 11,500
Disconnect Piping	EA		\$ 5,750	\$ -
Abandon PRV	EA		\$ 4,500	\$ -
Storage Tank	MG		\$ 600,000	\$ -
Subtotal				\$ 120,580
Subtotal Construction Cost				\$ 120,580
Contingency at 25 percent				\$ 30,145
Total Construction Cost				\$ 150,725
Engineering, Administration, Legal, etc. at 20 percent				\$ 30,145
Total Capital Cost				\$ 180,870

**Table 15
Opinion of Cost**

Project No. D-15 (9000S. & 2200 W. Loop, Relocate PRV)

(10-inch waterline, instal one PRV, and abandon one PRV on 2200 W. to loop Zone 2 waterline through developments)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS	1	\$ 30,000	\$ 30,000
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ 30,000
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF	1960	\$ 72	\$ 141,120
10-inch pipeline	LF	910	\$ 90	\$ 81,900
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	2870		\$ 223,020
Connection to Ex. System	EA	4	\$ 5,750	\$ 23,000
Disconnect Piping	EA	1	\$ 5,750	\$ 5,750
Abandon PRV	EA	1	\$ 4,500	\$ 4,500
Storage Tank	MG		\$ 600,000	\$ -
Canal Crossing	EA	2	\$ 25,000	\$ 50,000
Subtotal				\$ 306,270
Subtotal Construction Cost				\$ 336,270
Contingency at 25 percent				\$ 84,068
Total Construction Cost				\$ 420,338
Engineering, Administration, Legal, etc. at 20 percent				\$ 84,068
Total Capital Cost				\$ 504,405

Table 16
Opinion of Cost
Project No. D-16 (10-inch Ranch Road Waterline)

(10-inch waterline on Ranch Road between 7800 S. and Grizzly to separate pressure zones)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF	1810	\$ 90	\$ 162,900
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	1810		\$ 162,900
Connection to Ex. System	EA	2	\$ 5,750	\$ 11,500
Disconnect Piping	EA		\$ 5,750	\$ -
Abandon PRV	EA		\$ 4,500	\$ -
Storage Tank	MG		\$ 600,000	\$ -
Canal Crossing	EA		\$ 25,000	\$ -
Subtotal				\$ 174,400
Subtotal Construction Cost				\$ 174,400
Contingency at 25 percent				\$ 43,600
Total Construction Cost				\$ 218,000
Engineering, Administration, Legal, etc. at 20 percent				\$ 43,600
Total Capital Cost				\$ 261,600

Table 17
Opinion of Cost
Project No. D-17 (6000 W. Piping from Well 6 to Wells Park Road)
(16-inch waterline between Wells Park Rd & Dannon Way)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF	2270	\$ 108	\$ 245,160
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	2270		\$ 245,160
Connection to Ex. System	EA	2	\$ 5,750	\$ 11,500
Disconnect Piping	EA		\$ 5,750	\$ -
Abandon PRV	EA		\$ 4,500	\$ -
Storage Tank	MG		\$ 600,000	\$ -
U-111 Crossing	EA		\$ 25,000	\$ -
Subtotal				\$ 256,660
Subtotal Construction Cost				\$ 256,660
Contingency at 25 percent				\$ 64,165
Total Construction Cost				\$ 320,825
Engineering, Administration, Legal, etc. at 20 percent				\$ 64,165
Total Capital Cost				\$ 384,990

Table 18
Opinion of Cost
Project No. D-18 (Farm Road Pipe Replacement)
(Replace Existing 6-inch with 8-inch along Farm Road)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF	1820	\$ 72	\$ 131,040
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	1820		\$ 131,040
Connection to Ex. System	EA	2	\$ 5,750	\$ 11,500
Disconnect Piping	EA	2	\$ 5,750	\$ 11,500
Abandon PRV	EA		\$ 4,500	\$ -
Storage Tank	MG		\$ 600,000	\$ -
U-111 Crossing	EA		\$ 25,000	\$ -
Subtotal				\$ 154,040
Subtotal Construction Cost				\$ 154,040
Contingency at 25 percent				\$ 38,510
Total Construction Cost				\$ 192,550
Engineering, Administration, Legal, etc. at 20 percent				\$ 38,510
Total Capital Cost				\$ 231,060

**Table 19
Opinion of Cost**

Project No. T-1 (7800 So. Phase 3 Reconstruction Trans. Pipes)

(24-inch pipe on 7800 So., 2700 W. to Bangerter, 16-inch pipe, relocate PRV)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF	3350	\$ 144	\$ 482,400
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF	5450	\$ 215	\$ 1,171,750
Total LF	LF	8800		\$ 1,654,150
Connection to Ex. System	EA	4	\$ 5,750	\$ 23,000
Disconnect Piping	EA		\$ 5,750	\$ -
Abandon PRV	EA		\$ 4,500	\$ -
Storage Tank	MG		\$ 600,000	\$ -
Canal Crossing	EA	2	\$ 25,000	\$ 50,000
Subtotal				\$ 1,727,150
Subtotal Construction Cost				\$ 1,727,150
Contingency at 25 percent				\$ 431,788
Total Construction Cost				\$ 2,158,938
Engineering, Administration, Legal, etc. at 20 percent				\$ 431,788
Total Capital Cost				\$ 2,590,725

* Project work included in 7800 So. Phase 3 project

Table 20
Opinion of Cost
Project No. T-2 (Connect Airport Pump Station to Zone 3)
(16-inch pipe on 7800 So. 4000W. To 3850 W. (zone 2 PRV))

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF	1040	\$ 144	\$ 149,760
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	1040		\$ 149,760
Connection to Ex. System	EA	2	\$ 5,750	\$ 11,500
Disconnect Piping	EA		\$ 5,750	\$ -
Abandon PRV	EA		\$ 4,500	\$ -
Storage Tank	MG		\$ 600,000	\$ -
Subtotal				\$ 161,260
Subtotal Construction Cost				\$ 161,260
Contingency at 25 percent				\$ 40,315
Total Construction Cost				\$ 201,575
Engineering, Administration, Legal, etc. at 20 percent				\$ 40,315
Total Capital Cost				\$ 241,890

Table 21
Opinion of Cost
Project No. T-3 (Zone 6 Transmission Piping (NBH & SR111))
(20-inch & 16-inch pipe on NBH & SR-111 JWCD tank to 8200 South)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF	8190	\$ 144	\$ 1,179,360
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF	8540	\$ 180	\$ 1,537,200
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	16730		\$ 2,716,560
Connection to Ex. System	EA	1	\$ 5,750	\$ 5,750
Disconnect Piping	EA		\$ 5,750	\$ -
Abandon PRV	EA		\$ 4,500	\$ -
Road Crossing (jack and bore)	MG	1	\$ 40,000	\$ 40,000
Subtotal				\$ 2,762,310
Subtotal Construction Cost				\$ 2,762,310
Contingency at 25 percent				\$ 690,578
Total Construction Cost				\$ 3,452,888
Engineering, Administration, Legal, etc. at 20 percent				\$ 690,578
Total Capital Cost				\$ 4,143,465

Table 22
Opinion of Cost
Project No. T-4 (10200 South Zone 5 PRV & Reconnect)
(New PRV on 16-inch Pipe - modify pipe connection at tank site)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS	1	\$ 75,000	\$ 75,000
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ 75,000
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	0		\$ -
Connection to Ex. System	EA	1	\$ 5,750	\$ 5,750
Disconnect Piping	EA	1	\$ 5,750	\$ 5,750
Abandon PRV	EA		\$ 4,500	\$ -
Easement	LS	1	\$ 20,000	\$ 20,000
Subtotal				\$ 31,500
Subtotal Construction Cost				\$ 106,500
Contingency at 25 percent				\$ 26,625
Total Construction Cost				\$ 133,125
Engineering, Administration, Legal, etc. at 20 percent				\$ 26,625
Total Capital Cost				\$ 159,750

Table 23
Opinion of Cost

Project No. T-5 (Wells 4 & 6 Looping, 90 So. To Dannon Way)

(16-inch pipeline and PRV looping Wells 4 & 6 from 9000 South to Dannon Way)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS	1	\$ 25,000	\$ 25,000
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ 25,000
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF	1760	\$ 108	\$ 190,080
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF	890	\$ 144	\$ 128,160
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	2650		\$ 318,240
Connection to Ex. System	EA	4	\$ 5,750	\$ 23,000
Disconnect Piping	EA	1	\$ 5,750	\$ 5,750
Abandon PRV	EA		\$ 4,500	\$ -
Storage Tank	MG		\$ 600,000	\$ -
Pipe Easement	LS	1	\$ 50,000	\$ 50,000
Subtotal				\$ 396,990
Subtotal Construction Cost				\$ 421,990
Contingency at 25 percent				\$ 105,498
Total Construction Cost				\$ 527,488
Engineering, Administration, Legal, etc. at 20 percent				\$ 105,498
Total Capital Cost				\$ 632,985

Table 24
Opinion of Cost

Project No. T-6 (9400 S Piping from SR-111 to NBH)

(12-inch and PRV along 9400 South from SR-111 to New Bingham Highway)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS	1	\$ 100,000	\$ 100,000
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ 100,000
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF	3390	\$ 108	\$ 366,120
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF	1,160	\$ 144	\$ 167,040
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF	2230	\$ 180	\$ 401,400
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	6780		\$ 934,560
Connection to Ex. System	EA	4	\$ 5,750	\$ 23,000
Disconnect Piping	EA		\$ 5,750	\$ -
Abandon PRV	EA		\$ 4,500	\$ -
Storage Tank	MG		\$ 600,000	\$ -
Subtotal				\$ 957,560
Subtotal Construction Cost				\$ 1,915,120
Contingency at 25 percent				\$ 478,780
Total Construction Cost				\$ 2,393,900
Engineering, Administration, Legal, etc. at 20 percent				\$ 478,780
Total Capital Cost				\$ 2,872,680

Table 25
Opinion of Cost
Project No. T-7 (16-inch pipe on SR-111, 10200 S. to NBH)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA	1	\$ 160,100	\$ 160,100
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ 160,100
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF	3930	\$ 144	\$ 565,920
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	3930		\$ 565,920
Connection to Ex. System	EA		\$ 5,750	\$ -
Disconnect Piping	EA	2	\$ 5,750	\$ 11,500
Abandon PRV	EA		\$ 4,500	\$ -
Storage Tank	MG		\$ 600,000	\$ -
U-111 Crossing	EA		\$ 25,000	\$ -
Subtotal				\$ 577,420
Subtotal Construction Cost				\$ 737,520
Contingency at 25 percent				\$ 184,380
Total Construction Cost				\$ 921,900
Engineering, Administration, Legal, etc. at 20 percent				\$ 184,380
Total Capital Cost				\$ 1,106,280

Table 26
Opinion of Cost
Project No. T-8 (16-inch Pipe on SR-111, 7500 S. to 7000 S.)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF	3230	\$ 144	\$ 465,120
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	3230		\$ 465,120
Connection to Ex. System	EA		\$ 5,750	\$ -
Disconnect Piping	EA	1	\$ 5,750	\$ 5,750
Abandon PRV	EA		\$ 4,500	\$ -
Storage Tank	MG		\$ 600,000	\$ -
Subtotal				\$ 470,870
Subtotal Construction Cost				\$ 470,870
Contingency at 25 percent				\$ 117,718
Total Construction Cost				\$ 588,588
Engineering, Administration, Legal, etc. at 20 percent				\$ 117,718
Total Capital Cost				\$ 706,305

Table 27
Opinion of Cost
Project No. T-9 (16-inch Pipe along New Bingham Hwy from Terminal Tank to 9000 S.)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF	5090	\$ 144	\$ 732,960
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	5090		\$ 732,960
Connection to Ex. System	EA	4	\$ 5,750	\$ 23,000
Disconnect Piping	EA		\$ 5,750	\$ -
Abandon PRV	EA		\$ 4,500	\$ -
Storage Tank	MG		\$ 600,000	\$ -
Subtotal				\$ 755,960
Subtotal Construction Cost				\$ 755,960
Contingency at 25 percent				\$ 188,990
Total Construction Cost				\$ 944,950
Engineering, Administration, Legal, etc. at 20 percent				\$ 188,990
Total Capital Cost				\$ 1,133,940

Table 28
Opinion of Cost
Project No. P-1 (SR-111 Pump Addition)

(Remove Small Pump and Install 2-350 HP Pumps in Existing Pump Station)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Abandon Metered Delivery Point	EA		\$ 6,000	\$ -
Pump (Operational & 1 Standby)	HP	350	\$ 500	\$ 175,000
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ 175,000
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	0		\$ -
Connection to Ex. System	EA		\$ 5,750	\$ -
Disconnect Piping	EA		\$ 5,750	\$ -
Abandon PRV	EA		\$ 4,500	\$ -
Storage Tank	MG		\$ 600,000	\$ -
Subtotal				\$ -
Subtotal Construction Cost				\$ 175,000
Contingency at 25 percent				\$ 43,750
Total Construction Cost				\$ 218,750
Engineering, Administration, Legal, etc. at 20 percent				\$ 43,750
Total Capital Cost				\$ 262,500

Table 29
Opinion of Cost
Project No. P-2 (Terminal Reservoir Pump Station)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Abandon Metered Delivery Point	EA		\$ 6,000	\$ -
Pump (Operational & 1 Standby)	HP	600	\$ 1,500	\$ 900,000
Pump Station Structure, Site Plan	SF	500	\$ 150	\$ 75,000
Subtotal				\$ 975,000
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF	1000	\$ 180	\$ 180,000
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	1000		\$ 180,000
Connection to Ex. System	EA		\$ 5,750	\$ -
Disconnect Piping	EA		\$ 5,750	\$ -
Abandon PRV	EA		\$ 4,500	\$ -
Storage Tank	MG		\$ 600,000	\$ -
Subtotal				\$ 180,000
Subtotal Construction Cost				\$ 1,155,000
Contingency at 25 percent				\$ 288,750
Total Construction Cost				\$ 1,443,750
Engineering, Administration, Legal, etc. at 20 percent				\$ 288,750
Total Capital Cost				\$ 1,732,500

Table 30
Opinion of Cost
Project No. P-3 (Pump Station & Piping to Zone 7 North Tank)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Abandon Metered Delivery Point	EA		\$ 6,000	\$ -
Pump (Operational & 1 Standby)	HP	200	\$ 1,500	\$ 300,000
Pump Station Structure, Site Plan	SF	500	\$ 150	\$ 75,000
Subtotal				\$ 375,000
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF	4410	\$ 108	\$ 476,280
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	4410		\$ 476,280
Connection to Ex. System	EA		\$ 5,750	\$ -
Disconnect Piping	EA		\$ 5,750	\$ -
Abandon PRV	EA		\$ 4,500	\$ -
Storage Tank	MG		\$ 600,000	\$ -
Pipe Easement	LS	1	\$ 75,000	\$ 75,000
Subtotal				\$ 551,280
Subtotal Construction Cost				\$ 926,280
Contingency at 25 percent				\$ 231,570
Total Construction Cost				\$ 1,157,850
Engineering, Administration, Legal, etc. at 20 percent				\$ 231,570
Total Capital Cost				\$ 1,389,420

Table 31
Opinion of Cost
Project No. P-4 (Pump Station & Piping to Zone 7 South Tank)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Abandon Metered Delivery Point	EA		\$ 6,000	\$ -
Pump (Operational & 1 Standby)	HP	200	\$ 1,500	\$ 300,000
Pump Station Structure, Site Plan	SF	500	\$ 150	\$ 75,000
Subtotal				\$ 375,000
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF	4100	\$ 108	\$ 442,800
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	4100		\$ 442,800
Connection to Ex. System	EA		\$ 5,750	\$ -
Disconnect Piping	EA		\$ 5,750	\$ -
Abandon PRV	EA		\$ 4,500	\$ -
Pump Station Site	AC	1	\$ 50,000	\$ 50,000
Pipe Easement	LS	1	\$ 75,000	\$ 75,000
Subtotal				\$ 567,800
Subtotal Construction Cost				\$ 942,800
Contingency at 25 percent				\$ 235,700
Total Construction Cost				\$ 1,178,500
Engineering, Administration, Legal, etc. at 20 percent				\$ 235,700
Total Capital Cost				\$ 1,414,200

Table 32
Opinion of Cost
Project No. S-1 (Zone 1- New Airport 4 MG Tank)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	0		\$ -
Connection to Ex. System	EA		\$ 5,750	\$ -
Disconnect Piping	EA		\$ 5,750	\$ -
Demo Existing Tank	LS	1	\$ 100,000	\$ 100,000
Storage Tank	MG	4	\$ 600,000	\$ 2,400,000
Subtotal				\$ 2,500,000
Subtotal Construction Cost				\$ 2,500,000
Contingency at 25 percent				\$ 625,000
Total Construction Cost				\$ 3,125,000
Engineering, Administration, Legal, etc. at 20 percent				\$ 625,000
Total Capital Cost				\$ 3,750,000

Table 33
Opinion of Cost
Project No. S-2 (Zone 6 - Copperton 3 MG Tank)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA	1	\$ 160,100	\$ 160,100
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ 160,100
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF			\$ -
Connection to Ex. System	EA		\$ 5,750	\$ -
Disconnect Piping	EA		\$ 5,750	\$ -
Abandon PRV	EA		\$ 4,500	\$ -
Storage Tank	MG	3	\$ 600,000	\$ 1,800,000
Property Purchase	AC	3	\$ 150,000	\$ 450,000
Subtotal				\$ 2,250,000
Subtotal Construction Cost				\$ 2,410,100
Contingency at 25 percent				\$ 602,525
Total Construction Cost				\$ 3,012,625
Engineering, Administration, Legal, etc. at 20 percent				\$ 602,525
Total Capital Cost				\$ 3,615,150

Table 34
Opinion of Cost
Project No. S-3 (Zone 3 - OBH 3 MG Tank)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Abandon Metered Delivery Point	EA		\$ 6,000	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	0		\$ -
Connection to Ex. System	EA		\$ 5,750	\$ -
Disconnect Piping	EA		\$ 5,750	\$ -
Storage Tank	MG	3	\$ 600,000	\$ 1,800,000
Property Purchase	AC	3.5	\$ 150,000	\$ 525,000
Subtotal				\$ 2,325,000
Subtotal Construction Cost				\$ 2,325,000
Contingency at 25 percent				\$ 581,250
Total Construction Cost				\$ 2,906,250
Engineering, Administration, Legal, etc. at 20 percent				\$ 581,250
Total Capital Cost				\$ 3,487,500

Table 35
Opinion of Cost
Project No. S-4 (Zone 4 - NBH Terminal 3 MG Tank 2)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Abandon Metered Delivery Point	EA		\$ 6,000	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	0		\$ -
Connection to Ex. System	EA		\$ 5,750	\$ -
Disconnect Piping	EA		\$ 5,750	\$ -
Storage Tank	MG	3	\$ 600,000	\$ 1,800,000
Property Purchase	AC	2	\$ 150,000	\$ 300,000
Subtotal				\$ 2,100,000
Subtotal Construction Cost				\$ 2,100,000
Contingency at 25 percent				\$ 525,000
Total Construction Cost				\$ 2,625,000
Engineering, Administration, Legal, etc. at 20 percent				\$ 525,000
Total Capital Cost				\$ 3,150,000

Table 36
Opinion of Cost
Project No. S-5 (Zone 4 - SR-111 4 MG Tank 2)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Abandon Metered Delivery Point	EA		\$ 6,000	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF	250	\$ 215	\$ 53,750
Total LF	LF	250		\$ 53,750
Connection to Ex. System	EA		\$ 5,750	\$ -
Disconnect Piping	EA		\$ 5,750	\$ -
Storage Tank	MG	4	\$ 600,000	\$ 2,400,000
Property Purchase	AC	0	\$ 150,000	\$ -
Subtotal				\$ 2,453,750
Subtotal Construction Cost				\$ 2,453,750
Contingency at 25 percent				\$ 613,438
Total Construction Cost				\$ 3,067,188
Engineering, Administration, Legal, etc. at 20 percent				\$ 613,438
Total Capital Cost				\$ 3,680,625

Table 37
Opinion of Cost
Project No. S-6 (Zone 6 - Jordan Hill 3 MG Tank)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Abandon Metered Delivery Point	EA		\$ 6,000	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	0		\$ -
Connection to Ex. System	EA		\$ 5,750	\$ -
Disconnect Piping	EA		\$ 5,750	\$ -
Storage Tank	MG	3	\$ 600,000	\$ 1,800,000
Property Purchase	AC	0	\$ 150,000	\$ -
Subtotal				\$ 1,800,000
Subtotal Construction Cost				\$ 1,800,000
Contingency at 25 percent				\$ 450,000
Total Construction Cost				\$ 2,250,000
Engineering, Administration, Legal, etc. at 20 percent				\$ 450,000
Total Capital Cost				\$ 2,700,000

Table 38
Opinion of Cost
Project No. S-7 (Zone 6 - Copperton 3 MG Tank)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	0		\$ -
Connection to Ex. System	EA		\$ 5,750	\$ -
Disconnect Piping	EA		\$ 5,750	\$ -
Storage Tank	MG	3	\$ 600,000	\$ 1,800,000
Property Purchase	AC	0	\$ 150,000	\$ -
Subtotal				\$ 1,800,000
Subtotal Construction Cost				\$ 1,800,000
Contingency at 25 percent				\$ 450,000
Total Construction Cost				\$ 2,250,000
Engineering, Administration, Legal, etc. at 20 percent				\$ 450,000
Total Capital Cost				\$ 2,700,000

**Table 39
Opinion of Cost**

Project No. S-8 (Zone 2 - Grizzly 4 MG Tank 2)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	0		\$ -
Connection to Ex. System	EA		\$ 5,750	\$ -
Disconnect Piping	EA		\$ 5,750	\$ -
Storage Tank	MG	4	\$ 600,000	\$ 2,400,000
Property Purchase	AC	0	\$ 150,000	\$ -
Subtotal				\$ 2,400,000
Subtotal Construction Cost				\$ 2,400,000
Contingency at 25 percent				\$ 600,000
Total Construction Cost				\$ 3,000,000
Engineering, Administration, Legal, etc. at 20 percent				\$ 600,000
Total Capital Cost				\$ 3,600,000

Table 40
Opinion of Cost
Project No. S-9 (Zone 2 - Old Bingham Highway 2 MG Tank 2)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Abandon Metered Delivery Point	EA		\$ 6,000	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	0		\$ -
Connection to Ex. System	EA		\$ 5,750	\$ -
Disconnect Piping	EA		\$ 5,750	\$ -
Storage Tank	MG	2	\$ 600,000	\$ 1,200,000
Property Purchase	AC	0	\$ 150,000	\$ -
Subtotal				\$ 1,200,000
Subtotal Construction Cost				\$ 1,200,000
Contingency at 25 percent				\$ 300,000
Total Construction Cost				\$ 1,500,000
Engineering, Administration, Legal, etc. at 20 percent				\$ 300,000
Total Capital Cost				\$ 1,800,000

Table 41
Opinion of Cost
Project No. S-10 (Zone 1 - Airport Tank Replacement)
 (Remove Existing 2MG Tank & Replace with One 4 MG Tank)

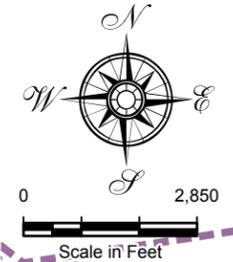
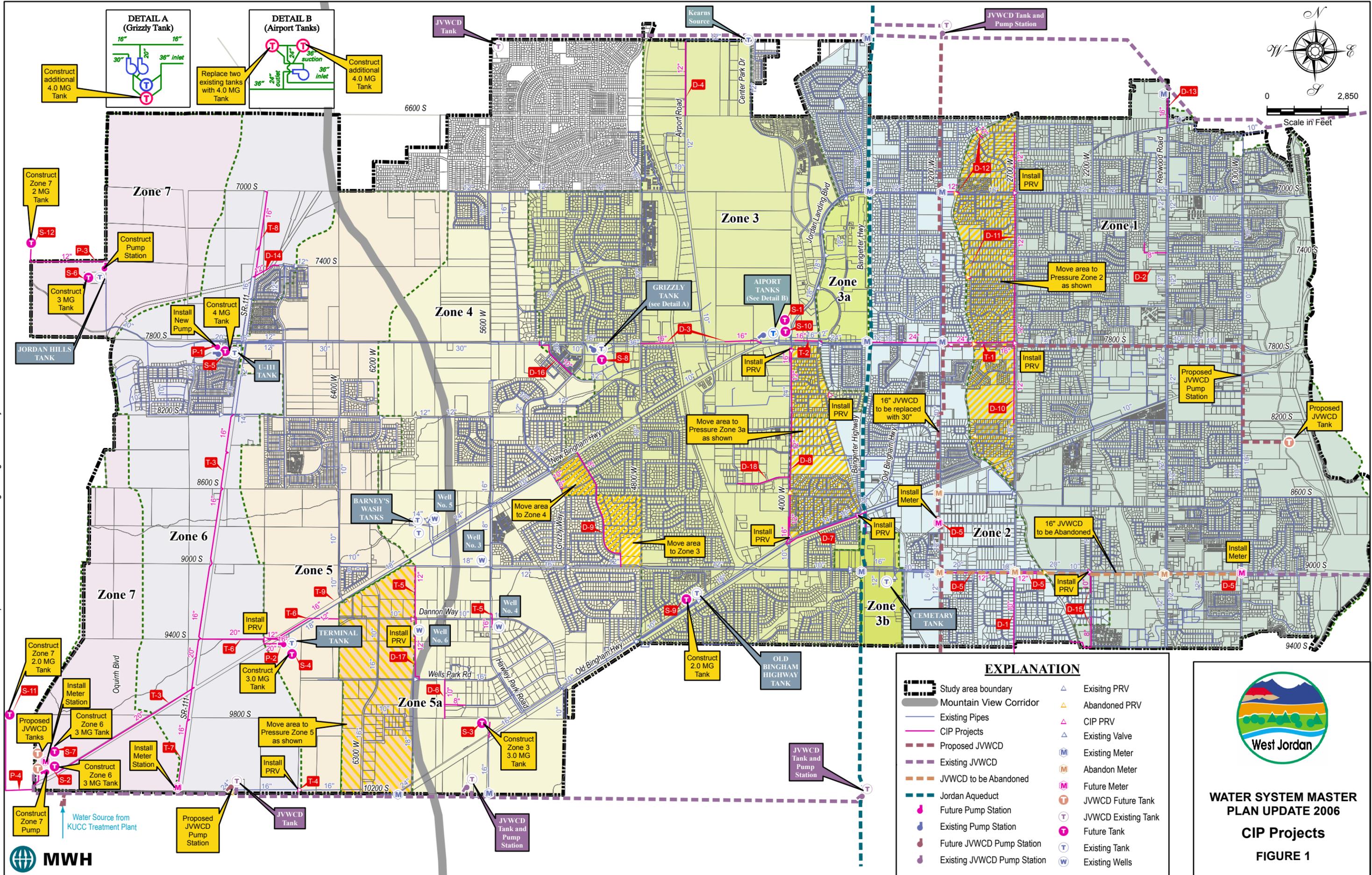
Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Abandon Metered Delivery Point	EA		\$ 6,000	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	0		\$ -
Connection to Ex. System	EA		\$ 5,750	\$ -
Disconnect Piping	EA		\$ 5,750	\$ -
Tank Demolition	LS	1	\$ 200,000	\$ 200,000
Storage Tank	MG	4	\$ 600,000	\$ 2,400,000
Subtotal				\$ 2,600,000
Subtotal Construction Cost				\$ 2,600,000
Contingency at 25 percent				\$ 650,000
Total Construction Cost				\$ 3,250,000
Engineering, Administration, Legal, etc. at 20 percent				\$ 650,000
Total Capital Cost				\$ 3,900,000

Table 42
Opinion of Cost
Project No. S-11 (Zone 7 - South 2 MG Tank)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Abandon Metered Delivery Point	EA		\$ 6,000	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	0		\$ -
Connection to Ex. System	EA		\$ 5,750	\$ -
Storage Tank	MG	2	\$ 600,000	\$ 1,200,000
Easements	LS	1	\$ 75,000	\$ 75,000
Property Purchase	AC	2.5	\$ 150,000	\$ 375,000
Subtotal				\$ 1,650,000
Subtotal Construction Cost				\$ 1,650,000
Contingency at 25 percent				\$ 412,500
Total Construction Cost				\$ 2,062,500
Engineering, Administration, Legal, etc. at 20 percent				\$ 412,500
Total Capital Cost				\$ 2,475,000

Table 43
Opinion of Cost
Project No. S-12 (Zone 7 - North 2 MG Tank)

Description	Unit	Quantity	Unit Cost	Total
6-inch PRV	LS		\$ 20,000	\$ -
8-inch PRV	LS		\$ 25,000	\$ -
10-inch PRV	LS		\$ 30,000	\$ -
12-inch PRV	LS		\$ 40,000	\$ -
16-inch PRV	LS		\$ 75,000	\$ -
20-inch PRV	LS		\$ 100,000	\$ -
24-inch PRV	LS		\$ 150,000	\$ -
Metered Delivery Point	EA		\$ 160,100	\$ -
Abandon Metered Delivery Point	EA		\$ 6,000	\$ -
Pump (Operational & 1 Standby)	HP		\$ 1,500	\$ -
Pump Station Structure, Site Plan	SF		\$ 150	\$ -
Subtotal				\$ -
6-inch pipeline	LF		\$ 54	\$ -
8-inch pipeline	LF		\$ 72	\$ -
10-inch pipeline	LF		\$ 90	\$ -
12-inch pipeline	LF		\$ 108	\$ -
14-inch pipeline	LF		\$ 125	\$ -
16-inch pipeline	LF		\$ 144	\$ -
18-inch pipeline	LF		\$ 162	\$ -
20-inch pipeline	LF		\$ 180	\$ -
24-inch pipeline	LF		\$ 215	\$ -
Total LF	LF	0		\$ -
Connection to Ex. System	EA		\$ 5,750	\$ -
Storage Tank	MG	2	\$ 600,000	\$ 1,200,000
Easements	LS	1	\$ 75,000	\$ 75,000
Property Purchase	AC	2.5	\$ 150,000	\$ 375,000
Subtotal				\$ 1,650,000
Subtotal Construction Cost				\$ 1,650,000
Contingency at 25 percent				\$ 412,500
Total Construction Cost				\$ 2,062,500
Engineering, Administration, Legal, etc. at 20 percent				\$ 412,500
Total Capital Cost				\$ 2,475,000

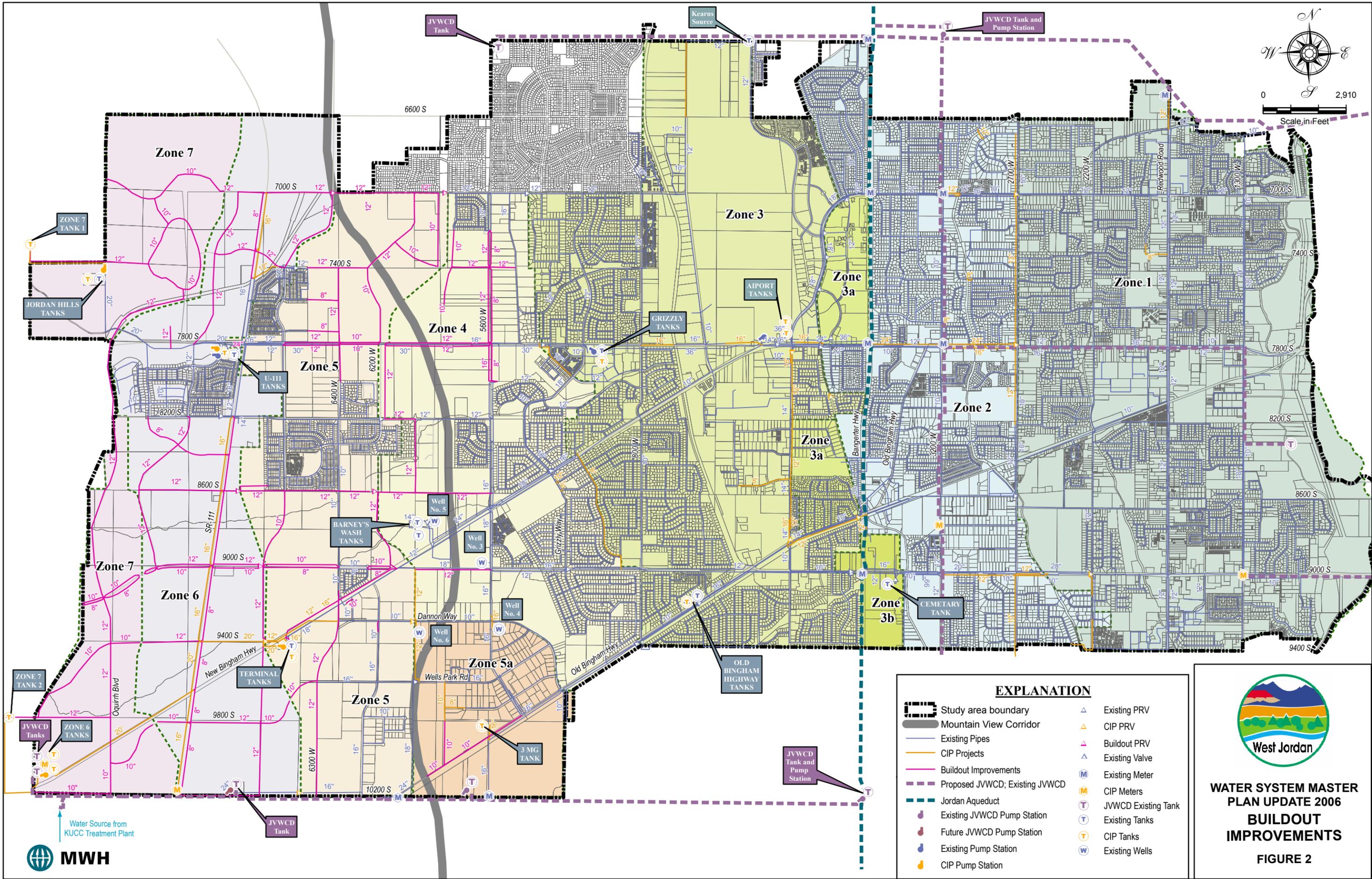


EXPLANATION

	Study area boundary		Existing PRV
	Mountain View Corridor		Abandoned PRV
	Existing Pipes		CIP PRV
	CIP Projects		Existing Valve
	Proposed JWWCD		Existing Meter
	Existing JWWCD		Abandon Meter
	JWWCD to be Abandoned		Future Meter
	Jordan Aqueduct		JWWCD Future Tank
	Future Pump Station		JWWCD Existing Tank
	Existing Pump Station		Future Tank
	Future JWWCD Pump Station		Existing Tank
	Existing JWWCD Pump Station		Existing Wells

WATER SYSTEM MASTER PLAN UPDATE 2006
CIP Projects
FIGURE 1





EXPLANATION

- Study area boundary
- Mountain View Corridor
- Existing Pipes
- CIP Projects
- Buildout Improvements
- Proposed JWCD; Existing JWCD
- Jordan Aqueduct
- Existing JWCD Pump Station
- Future JWCD Pump Station
- Existing Pump Station
- CIP Pump Station
- Existing PRV
- CIP PRV
- Buildout PRV
- Existing Valve
- Existing Meter
- CIP Meters
- JWCD Existing Tank
- Existing Tanks
- CIP Tanks
- Existing Wells



**WATER SYSTEM MASTER PLAN UPDATE 2006
BUILDOUT IMPROVEMENTS
FIGURE 2**