

**KINNELOA IRRIGATION DISTRICT**  
**REGULAR MEETING – BOARD OF DIRECTORS**  
**DISTRICT OFFICE**  
**TUESDAY – January 15, 2008**  
**7:30 P.M.**

**AGENDA**

- 1. CALL TO ORDER**
  - A. Declaration of a Quorum
  - B. Review of Agenda
- 2. PUBLIC COMMENT** -- Comments from the public regarding items on the Agenda or other items within the jurisdiction of the District.
- 3. APPROVAL OF RESOLUTION 2008-01-15 – TRUCK FINANCE AGREEMENT**
- 4. APPROVAL OF REIMBURSEMENT EXPENSE – HOLLY PIPELINE**
- 5. REVIEW COMMUNITY OUTREACH PLAN**
- 6. APPROVAL OF MASTER PLAN REVISION**
- 7. GENERAL MANAGER'S REPORT**
- 8. REVIEW OF MINUTES** – Regular Meeting– December 18, 2007
- 9. REVIEW OF FINANCIAL REPORTS** – December 31, 2007
- 10. ITEMS FOR NEXT AGENDA**
- 11. CALENDAR** – Regular Meeting – February 19, 2008  
March 20, 2008  
April 15, 2008
- 12. ADJOURNMENT**

Each item on the Agenda, no matter how described, shall be deemed to include any appropriate motion, whether to adopt a minute motion, resolution, payment of any bill, approval of any matter or action, or any other action.

# General Manager's Report

## January 15, 2008

### I. Projects

- A. Truck Replacement – Wondries Fleet Group has received the chassis and Pacific Utility Body is constructing the body. Final assembly of vehicle is expected at the end of January.
- B. T-Mobile Antenna Project – After considering the total cost of site construction, operation and the proposed monthly lease payments to the KID, T-Mobile has decided to use an alternative site.
- C. New York Drive 10-inch Main – Doreck has completed the project except for the re-striping of the bike lane as requested by the City of Pasadena. We will need to make some modifications to the valving at the Wilcox Reservoir and the SCADA system before the line is put into use. The line can be used manually if necessary until the automated system is in place.
- D. SCE Edison Automated Power Interruption – We received our first monthly credit in the amount of \$389 for the two facilities that are in the program. The K-3 Well will be added to the program after SCE completes a revision to the penalty clause to be more acceptable to the KID in case of our need for emergency pumping in the restricted time periods.

### II. Field Operations

- A. Wilcox Well Pump – Motor starter failed during routine operation. Although a temporary repair has been made, we need to determine the overall condition of the motor and determine if it is time to replace this 70's vintage motor with a new high efficiency unit to improve reliability and reduce electrical cost.
- B. Delores Tunnel – A landslide during the recent storms broke the line from the tunnel to the Vosburg Reservoir. A crew will repair the line in the near future from Perry Thomas Construction on a time and materials basis.

### III. Customer Correspondence and Service Issues for December

- A. None

## IV. Office Operations

### A. Delinquent Accounts

- 42 accounts received 10 day letters
- 14 accounts received 5 day letters
- 0 accounts received 24-hour shut off notice
- 0 accounts shut off

## V. Meetings and Conferences

- A. Foothill Municipal Water District Monthly Managers' Meeting – Discussed conservation issues and expected MWD allocation cutbacks
- B. ACWA/JPIA – Lee Patton did the annual inspection of our facilities and discussed our insurance coverage for property, liability and workers compensation to determine if any changes are need in our policies.

**MINUTES OF THE REGULAR MEETING  
OF THE BOARD OF DIRECTORS OF THE  
KINNELOA IRRIGATION DISTRICT  
December 18, 2007**

**MEMBERS PRESENT:** Directors Barkhurst, Griffith, Kilburn, Pickard and Sorell

**STAFF PRESENT:** Chris Burt, Facilities Supervisor  
Shirley Burt, Administrative Assistant  
Melvin Matthews, General Manager

**CALL TO ORDER:** The Meeting was called to order by the Chair, **Richard Barkhurst**, at 1930 hours. The Agenda was unanimously approved as presented.

**PUBLIC COMMENT:** No members of the public were present.

**REVIEW OF GLEN RESERVOIR WALL PROJECT**

**Director Pickard** presented two documents from the owner of the property adjacent to the Glen Reservoir regarding the wall that he had built between the two properties.

**Director Pickard** explained that the owner –

--Had a friend draw up the plans who is a project engineer

--Had a neighbor serve as an advisor and provide the workers who put up the wall but that the advisor did not serve as a contractor.

-- Paid the workers

**Director Griffith** questioned whether the footing from the prior short wall was left in place or was a new footing put in and the **General Manager** stated that he could confirm that the old footing was torn out and a new footing was put in.

**Director Griffith** question whether the wall was on district property and **Director Pickard** stated that he did not know but that he thought that was immaterial and that the wall was a benefit to the Kinneloa Irrigation District.

**Director Griffith** stated that at the last meeting he explained that if wall is over six feet or a retaining wall a permit is required and he noted also that the plans that have been presented do not apply to the wall that has been built.

**Director Sorell** noted that the plans show the wall height as being only six feet tall and **Director Pickard** stated that wall was approximately eight feet.

**Director Griffith** stated that if the Board is happy with the wall being built on District property and built without permits and presume it was built correctly then no further discussion is needed.

**Director Pickard** noted that in his letter the owner states that he assumes full responsibility for any problems that might arise.

**Director Sorell** commented that it was a big wall to have been put up without a permit and

**Director Pickard** replied that apparently Mr. Robert's was not told one was needed.

**Director Griffith** stated that the Advisor knew it but he stated that it would have taken a lot longer to get the job done.

**Director Kilburn** stated that she had heard that permits for walls were not required in the Glen and **Director Griffith** stated that they are required because they are in Los Angeles County.

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**REVIEW OF GLEN RESERVOIR WALL PROJECT (continued)**

**Director Sorell** replied that it might be a question as to the height of the wall.

**Director Griffith** stated that walls can be up to six feet high on the side of properties, up to forty two inches high in the front of properties but any time it is a retaining wall it takes a permit.

**Director Pickard** stated that he thought the concern expressed had to do with the wall being properly engineered and **Director Griffith** replied that the Advisor did not tell him anything about the wall being engineered but that he just helping a neighbor

**Director Pickard** stated that the Advisor should have said something to Mr. Roberts because the Advisor signed for the material.

**Director Sorell** stated that obviously the Advisor was more than a friendly neighbor but less than a contractor and also noted that plans submitted were for a typical retaining wall not the plans for the wall that was built.

**Director Griffith** expressed concern about the ownership of the wall since the owner states in his letter “that he assumes full responsibility for the maintenance and liability of the wall as my own property” and questioned if he maintains the wall over a period of time does that make it his property.

**Director Sorell** stated that as long as the District gives the owner permission to do it we are not giving him ownership and **Director Griffith** agreed stating that a letter should be sent to him so stating.

The **Facilities Supervisor** stated that he believes that the wall and the fence that was torn out did belong to the District as the District contracted to have it put in back in 1983 as part of the fencing of the site and that it is safe to assume that the current wall is on District property.

It was M/S/C –(Kilburn/Sorell-5/0)- **“That a letter be sent to Mr. Roberts stating that the Board discussed the construction of the wall and give him permission to construct the wall.”**

**REVIEW OF PROJECT LIST**

The **General Manager** reviewed the Project List and requested permission to proceed with the first four projects on the list in 2008. He noted that after the required engineering is done for the first project then detailed plans will be developed.

It was M/S/C – ( Griffith/Pickard-5/0)-**“That the following projects are approved—  
Kinneloa Mesa Pipeline Engineering Project  
Holly Chlortec Project  
Remote Meter Read Project  
Glen Transfer Switch Project”**

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**DEVELOPMENT OF PERIODIC NEWSLETTER**

The **General Manager** stated he would like to compose the Newsletter in-house but would appreciate articles provided by other persons.

**Director Barkhurst** stated that he thought the newsletter should be kept to one page as most people will not read it if it is longer and that it should contain articles that are germane to the issues that confront the rate payors of the District.

It was agreed that the newsletter would be a one page insert placed with the billing and that it would be printed as soon as enough articles are composed.

**COMMUNITY OUTREACH PLAN**

**Director Barkhurst** reminded the Board that their list of suggestions for the plan were to be submitted at this meeting to Director Kilburn so that she could cull them down to a workable list and assign specific tasks to each Board Member. He stated that the first action to be taken would be to select the venue.

Following further discussion regarding the details of the plan **Director Barkhurst** directed Director Kilburn to come back to the Board with her plan and a reasonable budget necessary to make the plan happen.

**SELECTION OF THE 2007 YEAR AUDITOR**

**Director Barkhurst** questioned the Treasurer as to how many years in a row the current Auditor Egan & Egan had been used and **Director Sorell** replied four years.

**Director Griffith** stated that he thought that last year there had been a discussion about looking for someone else and **Director Barkhurst** agreed.

**Director Sorell** stated that he had not sent out an RFP.

**Director Barkhurst** stated that sooner or later the District will be required by account convention if not regulation to select a new Auditor.

It was M/S/C-(Kilburn/Sorell-5/0) –**“That Egan & Egan be retained to conduct the 2007 Year Audit.”**

**ELECTION OF OFFICERS**

**Director Barkhurst** announced that there are three elective offices -- Chair, Treasurer and Secretary-- and asked if any Board Member would like to nominate their self or someone else for one or more of the positions. He explained that he was encouraging self nominations.

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**ELECTION OF OFFICERS (continued):**

**MINUTES OF THE REGULAR MEETING  
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**Director Griffith** nominated Director Sorell for Chair.

**Director Kilburn** nominated Director Sorell for Treasurer and the nomination was seconded by Director Pickard.

**Director Pickard** nominated Director Barkhurst for Chair.

**Director Barkhurst** nominated Director Pickard for Secretary.

**Director Barkhurst** asked for a second to the nomination of Director Sorell for Chair and the nomination failed for want of a second.

**Director Barkhurst** asked for a second to the nomination of Director Barkhurst for Chair and the nomination was seconded by Director Kilburn. Director Barkhurst was then unanimously elected as Chair for the year 2008.

**Director Barkhurst** asked for a second to the nomination of Director Sorell for Treasurer and the motion was seconded by Director Pickard. Director Sorell was then unanimously elected as Treasurer for the year 2008.

**Director Barkhurst** then asked for a second to the nomination of Director Pickard for Secretary and the nomination was seconded by Director Kilburn. Director Pickard was then unanimously elected as Secretary for the year 2008.

### **GENERAL MANAGERS REPORT**

The **General Manager** reviewed his report and highlighted the following topics.

**New York Drive Project:** The project is almost complete and is down to the point of pressure testing and tying in at two points.

**Summary Report of Additional Water Supplies:** He noted that there are not a lot of options for additional water and that the process of importing water is not a simple process.

**Director Barkhurst** requested that the Summary document be made available to the public.

### **REVIEW OF THE MINUTES**

The minutes of October 16, 2007 were unanimously approved as submitted.

The minutes of November 20, 2007 were unanimous approved as submitted with the addition of "1993" before the word fire in the middle of page 3.

### **REVIEW OF FINANCIAL REPORTS**

The Financial Reports were reviewed by Director Sorell. He noted that the income was high for the year because of the payment from FEMA.

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### **ITEMS FOR NEXT AGENDA:**

**MINUTES OF THE REGULAR MEETING  
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Community Outreach Plan  
T-Mobile Project

**ADJOURNMENT:**

The meeting was adjourned at 2125 hours and the next meeting will be on January 15, 2008.

Respectfully submitted,

Shirley L. Burt  
Secretary to the Board





**WATER MASTER PLAN**

**FOR**

**THE KINNELOA IRRIGATION DISTRICT**

**Adopted by the Board of Directors on June 20, 2000**

**Revision 1 dated June 20, 2005**  
**Adopted September 20, 2005**

**Draft Revision 2 dated September 21, 2007**

Melvin L. Matthews  
General Manager

Kinneloa Irrigation District  
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Pasadena, CA 91107  
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## **WATER MASTER PLAN EXECUTIVE SUMMARY**

The KID Water Master Plan provides a description of the Kinneloa Irrigation District's [KID] domestic water distribution system. It describes present, historical, and future water demands and potential future changes in the source of water supply. The Master Plan identifies and prioritizes necessary improvements and sets out cost estimates for implementing the improvements.

Since its formation in 1953, the KID has made minor renovations or upgrades to its system, based on a policy only to repair or replace facilities and pipelines as needed. However, by the mid 1990s a number of factors convinced the Board and many residents that significant upgrades to the system were needed.

Originally in 1953, the KID's parent systems' minimum fire flow standard was 750 gallons per minute [gpm] for 2 hours. This means that a fire truck could pump 750 gpm for up to 2 hours for a fire and all others homes in the same pressure zone would have enough residual pressure for basic domestic needs. Then in 1973 the Improvement District No. 1 [formerly Mira Loma Mutual Water Company] was designed for an average fire flow of 1000 gpm with 20 pounds per square inch [psi] residual. However, average means not every fire hydrant would meet this current standard. Currently, the County of Los Angeles Fire Department has a minimum standard of 1250 gpm to be pumped for 2 hours. Today, in 2007, approximately 40% of the current system doesn't meet the new standard for fire flow and fire hydrant location. The firestorm of October 1993 exposed weaknesses in the KID's pipeline delivery capacities. The Fire Preparedness Policy [FPP] was developed in February 1997 and revised in April 2005. The intent of the FPP was to set goals to be achieved to prepare for future multiple structure fires within the KID community. As a result, the KID Fire Preparedness Policy now requires that all new facilities, including pipe, be sized to support a fire flow of 1250 gpm with 20 psi minimum residual for 4 hours. The FPP is included as Exhibit III in the Appendix.

The information and data used in the Water Master Plan were developed from a number of sources:

- Discussions with the KID staff.
- A review of KID files dating back to 1953 was used for a baseline to build the initial data.
- Hydraulic studies completed for the Kinneloa Ridge Development and the Doyne Road Development contributed important information to the plan.
- The average day and maximum day demands were developed during the 1990-1991 droughts.

In April of 1996, ASL Consulting Engineers conducted a study of the KID to identify water main and reservoir improvements required to increase water system capabilities to deliver domestic demands plus 1,250 gpm-fire flows. As a part of this plan ASL Consulting Engineers prepared cost estimates in April 1996, with updates in February of 2000. Staff reviewed these estimates and made adjustments for inflation and other factors to update the plan for 2005 and again for this update in 2007.

After significant discussions and review of the original plan the Board determined that modification of the existing KID reservoirs was too expensive and would involve costly environmental studies. The Board determined that pump station improvements would better serve the District by concentrating on providing booster station flow capacities to achieve the desired fire flows of 1250 gpm. Cost estimates for KID funded improvements to reservoirs are in Exhibit I of the Appendix, but are not implemented in the Water Master Plan. However, should outside sources of funding become available consideration of these projects will be re-evaluated since increased reservoir storage capability is still an important objective of the District in order to prepare for all types of emergencies and to provide operational flexibility.

In addition to implementing pump station improvements the preparation of the Water Master Plan has revealed the following conclusions:

- All pipes that develop chronic leaks should be replaced to achieve overall lower operational cost.
- All pipes which have exceeded their useful life should be replaced. For the purpose of this plan, the useful service life of these facilities is set at 50 years.
- Pipelines, which have become inaccessible due to development or are traversing private property in easements, should be relocated.
- Pipelines should be upsized where required to meet the Fire Preparedness Policy goals.
- The KID presently has sufficient booster pump capacity to provide for domestic demands. The 1,250-gpm-fire flow requires supplementing booster station flow with gravity flow from reservoirs.
- Preferred installation for booster pumps would be high efficiency vertical turbine units.
- High Pressure Tunnel should have a permanent replacement pipeline.
- Low Pressure Tunnel should have a permanent replacement pipeline.
- The KID should provide radio telemetry at all facilities.
- All reservoirs should have earthquake sensors and automatic shutoff valves.
- The KID should continue to fund planned maintenance on all facilities.

The total estimated costs of all necessary improvements as identified in the Water Master Plan adopted in 2000 were:

1. Pipeline Improvements	\$1,192,600
2. Pump Station Improvements	\$ 108,200
3. Tunnels	\$ 421,900
4. Other Improvements	<u>\$ 395,500</u>
Total	\$2,118,200

The total estimated costs as revised and updated in 2005 were:

1. Pipeline Improvements	\$1,899,600
2. Pump Station Improvements	\$ 3,600
3. Tunnels	\$ 321,000
4. Other Improvements	\$ 271,000
5. Planned Maintenance	<u>\$ 687,400</u>
Total	\$3,182,600

The difference between the 2000 costs and 2005 costs was an increase of \$1,064,400. The net increase

was attributed to the following factors:

- Inclusion of planned maintenance items in the amount of \$687,400 that are expected over the next ten years.
- The estimated cost of remaining projects after removing completed projects and adding new projects identified since the master plan was adopted.
- Adjustment of previous costs to reflect inflationary and other factors in current project costs.
- Exclusion of projects paid by developers.

The following projects have been completed since the 2005 revision:

- East Tank has been refurbished.
- K-3 Well pump and motor have been rebuilt.
- One of the Holly booster pumps has been rebuilt.
- Safety upgrades were completed at Holly Tanks.
- Maintenance agreement with tank maintenance company was established for all five steel tanks.
- Earthquake-sensing valves have been installed as part of our emergency preparedness program at all tank and reservoir facilities except for the Brown Reservoir.
- Continuous chlorine analyzers have been installed at all production sources.
- Major upgrades to our SCADA system were completed to allow continuous monitoring and alarms on additional components of our production and distribution system.
- Permanent repairs and pipeline replacement were completed on the House Tunnel and the High/Low Pressure Tunnel production sources.
- The Vosburg booster pump was replaced with a new 25 hp submersible unit.

The total estimated costs for remaining projects as revised and updated in this 2007 Revision are:

1. Pipeline Improvements	\$3,128,000
2. Pump Station Improvements	\$ 190,000
3. Tunnels	\$ 321,000
4. Other Improvements	\$ 178,000
5. Planned Maintenance	<u>\$ 536,000</u>
Total	\$4,353,000

The difference between the 2005 costs and 2007 costs is an increase of \$1,170,400. The net increase is attributed to the following factors:

- Adjustment of previous costs to reflect inflationary and other factors in current project costs.
- A significant increase in pipeline construction costs based on bids for current projects.
- The estimated cost of remaining projects after removing completed projects and adding new projects identified since the master plan was adopted.

In conclusion, many of the distribution and transmission facilities predate 1953, and are nearing the end of their useful service life. Originally, water facilities in the KID provided domestic supply, plus a fire flow of 750 gpm. As the population of the KID has grown over the years, the demand placed upon the entire system, including distribution and transmission mains, water sources, reservoirs, and pump stations have encroached upon the ability of the system to meet the required demands. The need for increased fire flow to meet the minimum Fire Department requirements for every fire hydrant will require the KID to construct improvements to the water system in the years ahead. Although many projects identified in the Water Master Plan adopted in 2000 and subsequent revisions have been completed, failure to continue to undertake the expenditures for the remaining projects leaves the KID vulnerable to serious and sustained service failure in the event of natural disaster or unanticipated breakage. Moreover, the cost to replace facilities and pipelines under non-optimal emergency conditions is likely to be much higher than if done under a planned program.

Finally, as a footnote to this 2007 Revision, it should be noted that we are currently in a period of sustained drought with no expectation of normal rainfall in 2007-2008 season. Since the Wilcox Well is no longer a major production facility due to declining pumping levels in the Raymond Basin and since production level from the tunnels has also been declining due to the drought, we are increasingly dependent on a single production source – the K-3 Well. If the current conditions continue or worsen in the years ahead, the K-3 Well may not be able to meet our production demands. Therefore the KID staff will continue to examine possible new production sources such as drilling a new well and constructing a connection with Foothill Municipal Water District in order to receive imported water from the Metropolitan Water District. However, it should be noted that the cost of developing new production sources is not currently reflected in this Master Plan and that our adjudicated pumping rights in the Raymond Basin could be reduced in the future if the replenishment of the basin is not achieved through injection of imported water and/or through rainfall. Therefore voluntary or mandatory conservation programs may be necessary in the future to avoid major additional capital expenditures not included in this revision of the Master Plan.

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**WATER MASTER PLAN**  
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**KINNELOA IRRIGATION DISTRICT**  
**WATER MASTER PLAN**

**1.0 INTRODUCTION, PURPOSE, AND HISTORY**

**1.1 *Introduction***

The Kinneloa Irrigation District (KID) is a State irrigation district which owns and operates a water system in the north-central part of the Los Angeles County with the city limits of Pasadena on the west, south, and east sides and the Angeles National Forest to the north. The service area of the District covers an area of approximately 500 acres. The District additionally encompasses a watershed area north of the District of approximately 500 acres. The KID serves a population of approximately 1,450 and there are approximately 600 metered services in the District's service area. Additionally, it is the KID's responsibility to provide fire protection water to its customers. The District maintains approximately 90 fire hydrants.

Revenue for the KID is derived almost exclusively from the sale of water.

**1.2 *Purpose***

The purpose of this Master Plan is to describe the existing water system facilities within the KID, identify weaknesses within the system, recommend improvements, prioritize the necessary improvements, and determine cost estimates for implementing the improvements. This plan will also identify undeveloped land within the KID and assess potential for future development of that land.

**1.3 *History***

The Kinneloa Irrigation District, originally formed in 1953, is a state irrigation district established pursuant to Division 11 of the California Water Code. A five member publicly elected Board of Directors governs it. The District water system presently serves about 600 households as well as a school, nursery, church, and fire station. In 1974, the KID had 190 services.

In 1974 an improvement district was formed with the addition of the Mira Loma, Canyon Mutual, and Osborn Water Companies to the Kinneloa Irrigation District. This added additional 225 services to the KID.

In 1978, the Wilcox Well was upgraded to provide additional water. In 1979, 24 homes were added on Villa Highlands Drive and Villa Knolls Drive by Falzone Development.

In 1983, Nordberg and Neimeyer developed the area know as Hastings Heights and provided lots for 27 homes.

In 1990, 48 town homes were built by Dove Creek Development at a site near New York Drive and Altadena Drive.



In 2003, 21 building sites were completed in the Kinneloa Canyon area known as Kinneloa Ridge by Diamond-Segundo Development.

Additionally several individual lots have been developed to account for the 600 present metered services.

**KINNELOA IRRIGATION DISTRICT**  
**WATER MASTER PLAN**

**2.0 SYSTEM DESCRIPTION**

**2.1 *General***

The Kinneloa Irrigation District is divided into two distinct geographic areas. They are the east service area and the west service area, which are generally, divided by the Wilcox Canyon watercourse. Presently, the east and west service zones are connected by pipelines consisting of 6-inch and 8-inch pipe connecting the Holly Booster Pump Station, the East Tank, and the Vosburg Booster Station.

Almost all of the services in the KID are residential services for single family homes. The need for irrigating hillsides on relatively large lots creates much of the demand. Services and meters range from 3/4" to 2" in size.

Within each service area are several pressure zones which are serviced by a piping network, reservoirs, booster pump stations, wells, and horizontal water tunnels. See Exhibit II for a schematic drawing of the existing KID system.

**2.2 *Water Sources***

**2.2.1 Water Wells**

The KID owns and operates two water wells, which are the primary source of water for the District. Those wells are the Wilcox Well which supplies the Wilcox Reservoir and the K-3 Well which supplies the Eucalyptus Reservoir. Both wells pump from the Raymond Basin. The District adjudicated pumping allowance is 516 acre-feet per year plus an allowance for spreading. Current production is approximately 900 acre-feet per year. Both wells are equipped with deep well, oil lubricated, vertical turbine pumps and on-site generated sodium hypochlorite (0.8%) chlorinators with LMI metering pumps for disinfection. Well status signals are received via radio telemetry and start-stop commands are based on reservoir levels. See Table 2-1 for a summary of well data.

**TABLE 2-1  
WELL DATA**

<b>Well Name</b>	<b>Year Drilled &amp; Depth</b>	<b>Casing Size (inches)</b>	<b>Motor Horsepower</b>	<b>2006-2007 Production</b>
Wilcox Well	1924 500'	14"	100	70 acre-feet
K-3 Well	1965 700'	14" I.D.	125	860 acre-feet

2.2.2 Tunnels

The KID owns and operates 15 water supply tunnels. The tunnels were originally constructed by hand in the 1800's and, in recent times, have supplied groundwater to the KID system and for spreading. Tunnel flow rate varies continuously according to the time of year. Tunnel water is delivered via gravity. Table 2-2A summarizes the tunnels, their status, and production.

**TABLE 2-2A  
TUNNEL SUPPLIES**

<b>Tunnel Name</b>	<b>Current Status</b>	<b>2006-2007 Production</b>
High & Low Pressure Tunnels (4)	Currently in Service – feeds the Holly Tanks	131 acre-feet
House Tunnel	In service – feeds the Holly Tanks	27 acre-feet
Eucalyptus Tunnel	In service – feeds the Eucalyptus Reservoir	45 acre-feet
Long Tunnel	In service for spreading	37 acre-feet
Delores Tunnel	In service – feeds the Vosburg Reservoir or used for spreading	84 acre-feet
Far Mesa Tunnels (2)	In service – feed the Glen Reservoir	13 acre-feet
Tent Tunnel	In service for spreading	3 acre-feet
Falls Tunnel	In service for spreading	Not measured
Diversion Tunnel	In service for spreading	Not measured
Winifred Tunnels (2)	Not in service	Not measured

The KID also receives spreading credit from the Sierra Madre Villa Debris Basin and the Kinneloa Canyon Debris Basins. Total production from these sources for 2006-2007 was 202 acre-feet.

Depending on the season of the year, the tunnels are each capable of supplying anywhere from a few gallons per minute up to a hundred gallons per minute or more.

The tunnels have traditionally been a low cost source of water for the KID. However, the firestorm of October 1993 damaged the High and Low-Pressure Tunnel delivery pipelines. The rainstorms of the winter of 1993-94 further damaged the High and Low Pressure Tunnel pipelines. The High and Low Pressure Tunnel pipelines were further damaged in the winter storms of 1994-95. As a result of the aforementioned natural disasters, temporary repairs were made to return these sources to service and permanent repairs were made in 2006. Old age, rockslide damage, and rain storm runoff washed out the Delores Tunnel delivery pipeline. This pipeline was replaced in 2001 after being out of service since 1979.

Because of the age of the tunnels and their vulnerability to damage from natural causes, the tunnel supply is not considered as a reliable source of supply for the purpose of calculating available water source supply. In this respect, the tunnel supply should be thought of as a reserve or "back-up" supply.

### 2.2.3 Interconnections with the City of Pasadena

The KID currently has one interconnection to deliver KID excess water to the City of Pasadena and has five emergency interconnections. These interconnections are shown in Table 2-2B. The capacity of interconnections 3 and 5 are planned to be increased in 2007 or 2008 as a joint project with the City of Pasadena.

**TABLE 2-2B  
INTERCONNECTIONS WITH CITY OF PASADENA**

<b>ID</b>	<b>Location</b>	<b>Description</b>	<b>Size</b>	<b>Capacity</b>	<b>Purpose</b>
1	1776 Kinneloa Canyon Road	KID-Eucalyptus (1125 HWL) to Pasadena-Sheldon (1050 HWL)	4"	800 gpm	Deliver KID excess water to City of Pasadena
2	1727 Kinneloa Canyon Road	Pasadena-Calaveras (1209 HWL) to KID-Eucalyptus (1125 HWL)	4"	650 gpm	Emergency interconnection to KID-Eucalyptus (K-3 Well System)
3	3560 Ranch Top Road	Pasadena-Don Benito (1432 HWL) to KID-Vosburg (1430 HWL)	4"	400 gpm	Emergency interconnection to KID-Vosburg & Brown/Glen System
4	2999 New York Drive	Pasadena-Sheldon (1050 HWL) to KID-Wilcox Reservoir (944 HWL)	6"	1200 gpm	Emergency interconnection to KID-Wilcox Well/Wilcox Reservoir
5	3410 Fairpoint Street	KID-Vosburg (1430 HWL) to Pasadena-Murray System (1176 HWL)	2"	200 gpm	Emergency interconnection to Pasadena-Murray/Calaveras System
6	2650 New York Drive	Pasadena-Calaveras (1209 HWL) to KID-Eucalyptus (1125 HWL)	8"	1500 gpm	Emergency Fire Protection for Dove Creek Town Homes

#### 2.2.4 Portable Booster Pumps and Generator

The KID currently has two [2] trailer mounted portable boosters available for emergency operations and to supplement fire flows in some or all pressure zones. These pumps are capable of 1050 gallons per minute [gpm] at 360 feet Total Dynamic Head [TDH]. The KID also has a diesel-powered trailer mounted portable generator to supply emergency power to any of the KID facilities.

#### 2.3 **Reservoirs**

The KID operates and maintains nine (9) water storage tanks and reservoirs. Overflow elevations range from 940 feet to 1,637 feet. Reservoir data is shown in Table 2-3A.

**TABLE 2-3A  
STORAGE RESERVOIR DATA**

<b>Reservoir Name</b>	<b>Number &amp; Capacity</b>	<b>Zone Served</b>	<b>HWL</b>	<b>Construction</b>
Eucalyptus	1 - 0.180 MG	Eucalyptus	1,125'	Partially Buried Reinforced Concrete
Wilcox	1 - 1.125 MG	N/A	940'	Partially Buried Concrete
Holly Tanks	2 - 0.150 MG	Holly/Sage	1,460'	Circular, Welded Steel Aboveground
Vosburg	1 - 1.250 MG	Vosburg	1,430'	Partially Buried Reinforced Concrete
Glen	1 - 0.125 MG	Glen/Brown	1,265'	Buried Reinforced Concrete
Brown	1 - 0.125 MG	Glen/Brown	1265'	Buried Reinforced Concrete
East Tank	1 - 0.150 MG	East	1,637'	Circular Welded Steel, Aboveground
Sage Tank	1 - 0.225 MG	Holly/Sage	1,457'	Circular Welded Steel, Aboveground
West Tank	1 - 0.500 MG	West	1,634'	Circular Welded Steel, Aboveground
<b>Total Storage</b>	<b>3.980 MG</b>			

Existing storage capacity by zone is shown in Table 2-3B.

**TABLE 2-3B  
STORAGE CAPACITY BY SERVICE ZONE**

<b>Zone</b>	<b>Storage Capacity</b>
Eucalyptus	0.180 MG
Holly/Sage	0.525 MG
Glen/Brown	0.250 MG

East Tank	0.150 MG
Vosburg	1.250 MG
West Tank	0.500 MG

## 2.4 *Booster Pumping Facilities*

The KID operates and maintains five (5) separate booster-pumping facilities. All booster pumps are operated via telemetry and based upon reservoir levels. Booster pump facility data is shown in Table 2-4.

**TABLE 2-4  
BOOSTER PUMPING FACILITIES**

Facility Name	No. of Pumps	Horsepower	Head (feet)	Capacity (gpm)	Service
Eucalyptus	3	50 HP each	346'	400 each	Eucalyptus Reservoir to the Holly Tanks
Holly	2	20 HP each	205'	200 each	Holly Tanks to East Tank
Vosburg	1	25 HP	195'	280	Vosburg Reservoir to East Tank
Glen	1	25 HP	165'	345	Glen Reservoir to Vosburg Reservoir
Sage	2	25 HP each	205'	400 each	Sage Tank to West Tank
Wilcox Reservoir	1*	75 HP	325'	515	Wilcox Reservoir to Glen Reservoir
		75 HP	490'	360	Wilcox Reservoir to Vosburg Reservoir
	2**	50 HP & 75 HP	325'	650	Wilcox Reservoir to Glen Reservoir
		50 HP & 75 HP	490'	433	Wilcox Reservoir to Vosburg Reservoir

\* Condition when pumping to either the Glen Reservoir or the Vosburg Reservoir with just the 75 HP pump.

\*\*Condition when pumping to either the Glen Reservoir or the Vosburg Reservoir with both the 75 HP and 50 HP pumps.

## 2.5 *Piping*

### 2.5.1 Existing Piping

There are approximately 66,000 L.F. of transmission and distribution mains in the KID service area. The pipes range in size from 1" to 12-inch in diameter. Piping materials include galvanized steel, CML and CMC steel, asbestos cement (AC), ductile iron (DI) and AWWA C-900 PVC. There are approximately 90 fire hydrants in the system ranging in size from 2 ½" to 6" x 4" x 2 ½". All of the galvanized steel piping is old and obsolete. Some of the existing pipe is old and inadequate to provide current revised requirements for fire service.

### 2.5.2 Future Piping

Traditionally, piping in the KID was sized to provide for fire flows of 750 gpm. The firestorm of October 1993 exposed the pipeline delivery capacity weaknesses. As a result, the KID Fire Preparedness Policy now requires that all new facilities, including pipe, be sized to support a fire flow of 1,250 gpm with a 20 psi minimum residual. This represents a 500 gpm increase to the original system design capacity of 750 gpm fire flow at 20 psi minimum residual pressure. Some areas of the existing system meet the new requirements; however, a small portion of the distribution system will provide only the minimum original system design fire flows. Additionally the County of Los Angeles has required 2000 gpm fire flow for some of the new larger homes currently being built where fire sprinklers are required. Future pipeline projects may need to sized to support this flow.

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**3.0 EXISTING SERVICE DEMANDS**

The KID services approximately 600 customers with a population of approximately 1,450. Service sizes range from 3/4" to 2". All services within the District are residential with the following exceptions:

- High Point Academy
- Magic Growers
- Los Angeles County Fire Station No. 66
- Pasadena Church of Christ
- Equestrian Center

The KID produces water from two wells and several tunnels. The 2006-2007 production from those sources is shown in Table 3-1.

**TABLE 3-1  
TUNNEL AND WELL PRODUCTION DELIVERED TO DISTRIBUTION SYSTEM 2006-2007**

Source	2006-2007 Production
K-3 Well	860.1 acre-feet
Wilcox Well	70.2 acre-feet
High and Low Pressure Tunnels	131.0 acre-feet
Far Mesa Tunnel	13.1 acre-feet
House Tunnel	26.5 acre-feet
Eucalyptus Tunnel	44.6 acre-feet
Delores Tunnel	83.6 acre-feet
<b>TOTAL</b>	<b>1229.0 acre-feet</b>

Additional production from tunnels is delivered for spreading in the Raymond Basin. Water delivered for spreading can be recovered by the District by increased pumping allotments or can be sold to other water purveyors. In 2006-2007, water delivered for spreading by the KID amounted to 202 acre-feet. The sources of this water in a particular year can include the High and Low Pressure Tunnels, the Long Tunnel, Delores Tunnel, Diversion Tunnel, Falls Tunnel, Winifred Tunnels, Tent Tunnel, and surface runoff from watershed owned by the District into the Glen Wash, Kinneloa Canyon Debris Basins and the Sierra Madre Villa Debris Basin.



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**4.0 FUTURE DEVELOPMENT**

**4.1 *General***

A report dated July 2, 1990 prepared for the KID by ASL Consulting Engineers identified a potential for 95 new dwelling units within the KID boundaries. The report identified 57 potential units which would be built by developers and another 38 units which would most probably be constructed as single units and not part of a development project. Since that time all major development work has been completed except for a potential development of 8-12 homes in the Doyne Road area as described below and the building or re-building of approximately 25 homes on individual vacant lots.

**4.2 *Doyne Road Development***

Hydraulic studies were completed for a potential development (Tract no. 44323) that is planned to be constructed in the south central area of the KID. The new tract would be served from the existing Holly/Sage Zone. The development requires the grading of 8-12 undeveloped lots ranging in size from 0.60 acres to 3.0 acres. Total area is approximately 13-18 acres depending on the final development plan. Water system improvements for this tract would include new distribution and transmission mains and a new booster pump station at the Wilcox Reservoir. The status of this project is uncertain at the present time.

**4.3 *Potential Future Well Sites***

The KID has a few potential future water source well sites within the District boundaries. The Equestrian Center north of New York Drive was acquired by the Los Angeles County and incorporated into the Eaton Canyon Natural Area. The park status will allow for a well site for the District. The area of Wilcox Canyon, north or south of the Wilcox Reservoir also offers potential for a future well site.

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**5.0 CAPACITY CHARGE IMPROVEMENT FEE**

Improvements were made to the KID water system during the Dove Creek Development in 1987-1990. These improvements included improvements to the K-3 Well, Eucalyptus Reservoir, and piping in New York Drive. At the time of these improvements, the KID decided to build in reserve system capacity and redundancy beyond that required by the Dove Creek Development. Because the cost of the improvements was beyond what was required by the Dove Creek Development, the KID funded the marginal increase of the cost of the improvements beyond the Dove Creek Development requirements.

To recover the cost of the reserve capacity, the Board of Directors of the KID in 1990 instituted a Capacity Charge Improvement Fee on all future development in the District. The fee is \$3,000.00 per lot and is only charged for existing or newly created lots that do not have an existing water service. This fee is in addition to reimbursement for the cost of installing the water service.

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**6.0 SERVICE DEMANDS**

**6.1 *Existing Service Demands***

Average day and maximum day service demands are based on water delivery records for the drought year (September 1990 – September 1991). Average day demand is the total annual water delivered as recorded by the individual customer water meters averaged over 365 days per year. Maximum day demand is the maximum day total water delivered, averaged over 24 hours. Maximum day delivery data is not available for individual customer water meters. Customer water meter demand is only recorded monthly. Individual pumping facility production and reservoir levels are recorded daily at roughly the same time each day. Individual facility records are used to determine maximum day total water delivery. To establish a comparison between average day and maximum day demands it is necessary to compare average day and maximum day demands of the same representative service area. Average day and maximum day data is available for the total Holly and East Tank service area.

The record data for this service area indicates the following:

- 237 services
- 189 total acres
- Annual delivery of 134,990 billing units
- Maximum day delivery (7/29/1990) of 1,029 billing units

Average Day Demand

$$\frac{134,990 \text{ B.U.}}{189 \text{ Acre/Year}} \times \frac{749 \text{ Gal.}}{\text{B.U.}} \times \frac{1 \text{ Year}}{365 \text{ Days}} \times \frac{1 \text{ Day}}{1,440 \text{ Min.}} = \underline{1.02 \text{ Gal/Min Acre}}$$

OR:

$$\frac{134,990 \text{ B.U.}}{237 \text{ Services}} \times \frac{749 \text{ Gal.}}{\text{B.U.}} \times \frac{1 \text{ Year}}{365 \text{ Days}} \times \frac{1 \text{ Day}}{1,440 \text{ Min.}} = \underline{0.81 \text{ Gal/Min Service}}$$

Maximum Day Demand

$$\frac{1,029 \text{ B.U.}}{189 \text{ Acre/Day}} \times \frac{749 \text{ Gal.}}{\text{B.U.}} \times \frac{1 \text{ Day}}{1,440 \text{ Min.}} = \underline{2.83 \text{ Gal/Min Acre}}$$

OR:

$$\frac{1,029 \text{ B.U.}}{237 \text{ Services}} \times \frac{749 \text{ Gal.}}{\text{B.U.}} \times \frac{1 \text{ Day}}{1,440 \text{ Min.}} = \frac{2.26 \text{ Gal/Min}}{\text{Service}}$$

The ratio of the maximum day demand over the average day demand is the maximum day factor. For the existing Holly and East Tank Zone, the maximum day factor is as follows:

$$\frac{2.83}{1.02} = 2.77$$

Existing service demands for the number of services in 2007 for each zone were based on the calculated average day and maximum day demand factors for the Holly and East Tank Zone and are shown in Table 6-1.

**TABLE 6-1**  
**SERVICE DEMANDS BY ZONE IN THE**  
**KINNELOA IRRIGATION DISTRICT**

Service Zone	No. of Services	Average Day Demand 0.81 gpm/service (gpm)	Maximum Day Demand 2.26 gpm/service (gpm)
Eucalyptus	62	51	141
Holly/Sage	190	154	430
East	61	49	138
West*	25	33	90
Brown/Glen	70	56	159
Vosburg	192	156	432

\*Homes in this area are newly-constructed and average day demand is based on 1.3 gpm per acre and maximum day demand of 3.6 gpm per acre.

## 6.2 *Future Service Demands*

Future service demands for various zones in the KID system were calculated based on the number of existing services, the planned additional services and the estimated future customer service demands. Planned additional services in the KID service area have a higher potential for water use than the existing customer services. Planned additional services are estimated to be comparable to the Shaw Ranch Estate type properties. Shaw Ranch record data indicates the September 1990 – September 1991 annual demand for 24 active services, serving 16.94 acres was a total of 21,984 billing units. Average day demand for planned future services is calculated as follows:

$$\frac{21,984 \text{ B.U.}}{16.94 \text{ Acre/Yr}} \times \frac{748 \text{ Gal.}}{\text{B.U.}} \times \frac{1 \text{ Year}}{365 \text{ Days}} \times \frac{1 \text{ Day}}{1,440 \text{ Min.}} = \frac{1.85 \text{ gpm}}{\text{Acre}}$$

OR:

$$\frac{21,984 \text{ B.U.}}{24 \text{ Services}} \times \frac{748 \text{ Gal.}}{\text{B.U.}} \times \frac{1 \text{ Year}}{365 \text{ Days}} \times \frac{1 \text{ Day}}{1,440 \text{ Min.}} = \underline{1.30 \text{ gpm}} \text{ Service}$$

Maximum day demand for planned future services is the average day demand multiplied by the developed maximum day factor as follows:

$$1.85 \text{ gpm/acre} \times 2.77 = 5.12 \text{ gpm/acre}$$

OR:

$$1.30 \text{ gpm/service} \times 2.77 = 3.60 \text{ gpm/service}$$

For master planning and calculation of future system demands, 5.12 gpm/acre or 3.60 gpm/service will be used to calculate future service demands per zone. Table 6.2 shows the future service demand of the potential new services by zone.

**TABLE 6-2**  
**FUTURE SERVICE DEMANDS BY ZONE IN THE**  
**KINNELOA IRRIGATION DISTRICT**

<b>Service Zone</b>	<b>No. of Future Services</b>	<b>Average Day Demand 1.3 gpm/service (gpm)</b>	<b>Maximum Day Demand 3.6 gpm/service (gpm)</b>
Eucalyptus	1	1.3	3.6
Holly/Sage	16	21.0	58.0
East	1	1.3	3.6
West	0	0.0	0.0
Brown/Glen	8	11.0	29.0
Vosburg	5	7.0	18.0

Table 6-3 shows the sum of the water demand for existing services and the potential new services.

**TABLE 6-3**  
**TOTAL FUTURE SERVICE DEMANDS BY ZONE**  
**IN THE KINNELOA IRRIGATION DISTRICT**

<b>Service Zone</b>	<b>Total Services</b>	<b>Average Day Demand (gpm)</b>	<b>Maximum Day Demand (gpm)</b>
Eucalyptus	63	83	227
Holly/Sage	206	269	742
East	62	81	224
West*	25	44	119
Brown/Glen	78	101	281
Vosburg	197	254	702

\*West Tank service demand based on 1.85 gpm/acre average day and 5.12 gpm/acre maximum day demands and a 23.3 acre service area.

**KINNELOA IRRIGATION DISTRICT**  
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**7.0 SYSTEM IMPROVEMENTS**

**7.1 *General***

The KID was formed in 1953. Many of the distribution and transmission pipelines predate 1953 and are nearing the end of their useful service life. For the purposes of this plan, the useful service life of the pipelines is set at 50 years. Development of excessive numbers of leaks and/or reduced pipeline capacity is two of the indications of pipelines at the end of their useful service life.

Originally, water mains in the KID provided domestic supply plus a fire flow of 750 gpm. The existing distribution system meets the original fire flow design criteria. The firestorms of October 1993 exposed the KID pipeline delivery capacity weakness. As a result, the KID adopted a Fire Preparedness Policy which requires new water mains to be sized to provide 20 gpm per service, plus a fire flow of 1,250 gpm each at two fire hydrants simultaneously.

As the population of the KID has grown over the years, the demands placed upon the entire system, including distribution and transmission mains, water sources, reservoirs, and pump stations have encroached upon the ability of the system to meet the required demands. Population growth, plus the need for increased fire flow to provide adequate fire protection will require the KID to construct improvements to the KID water system.

**7.2 *Piping***

In April 1996, ASL Consulting Engineers conducted a study for the KID to identify water main improvements required to increase water system capabilities to deliver domestic demands plus 1,250 gpm fire flows. The results of the study are shown in Table 7-1.

All pipes that develop chronic leaks should be replaced to decrease waste of water and to achieve overall lower operational costs.

In addition, pipes which have exceeded their useful life should be replaced. It can be shown that replacing older pipelines will result in lower long-term operational costs. Pipelines which have become inaccessible due to development or are traversing private property in easements should also be replaced if practical and/or possible. Pipelines should be upsized where required to meet the fire preparedness goals. Upsizing is to be determined by hydraulic modeling and verified by field-testing.

Projects that are listed in Table 7-1 provide a remedy for the following conditions:

- Chronically leaking pipes.
- Pipe requiring upgrade to meet domestic demand and fire preparedness goals.
- Piping which has exceeded its useful service life of 50 years.
- Piping which has become inaccessible due to development or traverses private property in easements.

**TABLE 7-1  
REQUIRED WATER MAIN REPLACEMENTS  
TO MEET 1,250 GPM FIRE FLOW AND  
450 FEET VEHICULAR DISTANCE**

Main Size	Description	
	From	To
8"	1900 Windover Road	Corner of 2090 & 2060 Villa Heights Road
8"	Intersection Larmona Drive & Kinneloa Mesa Rd.	1908 N. Kinneloa Cano Rd.
12"	New Connection to Vosburg Reservoir	
16"	2014 Windover Road	Sierra Madre Villa Avenue
10"	Sierra Madre Villa Avenue and Windover Road	Vosburg Street
8"	Intersection of Sierra Madre Villa & Villa Mesa Rd.	In Front of 3336 Villa Mesa Rd.
8"	Intersection of Meyerloa & Kinneloa Mesa Rd.	In Front of 2985 Meyerloa Ln.
8"	Intersection of Kinneloa Mesa Rd. & Clarmeya Ln.	In Front of 2924 Clarmeya Ln.
8"	Intersection of Kinneloa Mesa Rd. & Lindaloe Ln.	In Front of 2925 Lindaloe Ln.
8"	Intersection of Kinneloa Mesa Rd. & Doyne Rd.	In Front of 3069 Doyne Rd.
8"	Country Lane	Southeast Corner of 1747 Country Lane
12"	Glen Reservoir	Intersection Villa Highlands & Sierra Madre Villa Includes Slope from Pasadena Glen to Barhite
8"	Kinclair Dr.	Behind 2150 Kinclair Dr.
8"	Kinclair Dr.	#4 Cricklewood Path



Main Size	Description	
	From	To
8"	Kinneloa Canyon Rd.	Behind 2044 Piccadilly Ln.
8"	Intersection of Vosburg St. & Lower Pasadena Glen Rd.	In Front of 1658 Pasadena Glen Rd.

### 7.3 *Booster Pump Stations*

#### 7.3.1 Existing Booster Pump Stations

The KID presently has sufficient booster pump capacity to provide for domestic demands. The 1,250-gpm-fire flow requires supplementing booster station flow with gravity flow from reservoirs.

There are booster pump facilities located at the Eucalyptus Reservoir, Holly Tanks, Sage Tank, Wilcox Reservoir, Glen Reservoir and at the Vosburg Reservoir. The booster pumps at the Eucalyptus Reservoir were replaced with high efficiency vertical turbine units in 2002 as part of the system improvements needed for the Kinneloa Ridge Development.

The booster pump at the Holly Tank is a horizontal, split case pump. A preferred installation would be high efficiency vertical turbine units set in cans.

The booster pump at the Vosburg Reservoir is a submersible, centrifugal pump. A preferred installation would be high efficiency vertical turbine unit, but a replacement 25 hp submersible pump that was installed in 2006 is providing increased flow and efficiency as compared to the previous 20 hp unit.

Table 7-2A compares the required booster pump station capabilities with existing booster pump station capabilities. Required booster pump station capabilities will supply maximum day demand with an off-peak 16-hour maximum pumping period.

**Required Booster Pump Capacity Calculations** -- Each booster facility must provide capacity to serve all zones in the system above the booster station.

- Eucalyptus Booster Station must provide capacity to serve Holly/Sage Zone, West Zone, and ½ of the East Zone. Flow rates required are from Table 6-3.

$$\text{Eucalyptus Booster Capacity} = \frac{24}{16} (738+119+\frac{220}{2}) = 1,451 \text{ gpm}$$

- Holly Booster Station must provide ½ of the East Zone.

$$\text{Holly Booster Capacity} = \frac{24}{16} \frac{(220)}{2} = 165 \text{ gpm}$$

- Vosburg Booster capacity is 285 gpm.
- Glen Booster must supply Vosburg Zone and ½ of East Zone.

$$\text{Glen Booster Capacity} = \frac{24}{16} \frac{(702+119+220)}{2} = 1,397 \text{ gpm}$$

- Sage Booster supplies the West Zone only.

$$\text{Sage Booster Capacity} = \frac{24}{16} (119) = 179 \text{ gpm}$$

- Wilcox Booster must supply Vosburg Zone, Brown/Glen Zone and ½ of East Tank Zone.

$$\text{Wilcox Booster Capacity} = \frac{24}{16} \frac{(702+277+220)}{2} = 1,634 \text{ gpm}$$

**TABLE 7-2A**  
**COMPARISON OF REQUIRED BOOSTER PUMP CAPACITIES**

<b>Booster Station</b>	<b>Required Future Pump Capacities (gpm)</b>	<b>Existing Capacity (gpm)</b>	<b>Additional Capacity Required (gpm)</b>
Eucalyptus	1,451	1,600	0
Holly	165	400	0
Vosburg	165	285	0
Glen	1,397	345	1,052
Sage	179	400	0
Wilcox Reservoir	1,634	650	984

Table 7-2B shows the proposed concept for increasing booster pump station efficiencies and/or capacities.

**TABLE 7-2B**  
**REQUIRED BOOSTER IMPROVEMENTS**

Booster Station	Description
Glen	Increase booster pump capacity.
Holly	Replace existing pumps with vertical turbine pumps in cans.
Wilcox Reservoir*	Increase booster pump capacity.

\* Pipeline upgrades required to reduce pumping head.

### 7.3.2 Proposed Booster Pump Stations

The Doyme Road Development if constructed will require additional booster pump capacity at the Wilcox Reservoir. The cost of additional booster pump capacity will be provided by the developer. The necessary improvements have already been made at the Eucalyptus Booster Pump Station in conjunction with the Kinneloa Ridge Development. However, two new 50 HP booster pumps at the Wilcox Reservoir will be needed to supply the Holly Tanks.

## 7.4 *Tunnels*

### 7.4.1 High Pressure Tunnel

The High Pressure Tunnel pipeline is currently in service and supplies water to the Holly Tanks or the West Tank. The High Pressure Tunnel pipeline was damaged during the firestorms of October 1993. Additional damage occurred from mudslides during the rainy season of subsequent years. In 1994, the High Pressure Tunnel pipeline was repaired with FEMA funding. In the winters of 1994-95 and 2004-05, the High Pressure Tunnel pipeline was again damaged by mudslides. The KID applied for FEMA funding as a result of the disaster declaration after the 2004-2005 storms and permanent repairs were completed in 2006 using a combination FEMA funds and KID funds.

### 7.4.2 Low Pressure Tunnels

Pipelines delivering water from the Low Pressure Tunnels to the Holly Tanks have been out of service at various times since 1993. Both low pressure tunnel pipelines were damaged during the fire storms of October 1993. Further damages occurred from mudslides during the rainy seasons of subsequent years. In 1994, the lower Low Pressure Tunnel pipeline was replaced using FEMA funding. In subsequent rainy seasons, the tunnel has since been buried by mudslides. The

storms of 2004-2005 further damaged the lines. The KID applied for FEMA funding to repair the lines in order to take advantage of the low cost water supply. The upper low pressure tunnel pipeline was replaced and put back in service in 2006. The lower tunnel was excavated to the tunnel face, but further work has been suspended due to funding and safety concerns.

7.4.3 House Tunnel

The House Tunnel pipeline was also damaged in the 2004-2005 storms. The damaged section was replaced with flexible hose suspended from a cable and the rest of the pipeline was inspected and repaired at two locations. Since the majority of the pipeline is galvanized steel and was installed decades ago, it is expected that the pipeline will need to be replaced within the next 20 years even if there is no further storm damage.

7.4.4 Delores Tunnel

The Delores Tunnel was out of service between 1979 and 2001 due to rockslide and rain storm damage to the delivery pipeline. Although this pipeline was replaced in 2001 with flexible hose suspended from a cable for much of its length, it is still vulnerable to damage in the future. Therefore it is expected that portions will need to be repaired or replaced within the time frame of this master plan.

The required tunnel pipeline improvements are listed in Table 7-3.

**TABLE 7-3  
REQUIRED TUNNEL IMPROVEMENTS**

Tunnel	Description
High Pressure	Periodically inspect pipeline for potential damage from landslides. Inspect for leaks and repair or replace pipeline as needed.
Low Pressure	Periodically inspect pipeline for potential damage from landslides. Continue excavation of lower tunnel and complete new tunnel face and pipeline between the tunnel and the injector if tunnel flow is significant.
House	Periodically inspect pipeline for potential damage from landslides. Inspect for leaks and repair or replace pipeline as needed.
Delores	Periodically inspect pipeline for potential damage from landslides. Inspect for leaks and repair or replace pipeline as needed.

7.5 *Other Improvements*

7.5.1 General

Within Section 7 of this master plan, necessary improvements have been identified which would connect tunnel water supplies to the system and improve system hydraulics in order to meet a 1,250 gpm fire flow for two hours. Also, improvements to reservoirs have been identified which are necessary to meet a minimum 1,250 gpm fire flow for two hours plus domestic demands. Finally, developer financed improvements have been identified which are necessary to provide fire flow and domestic supply to the proposed developments. This section will examine other necessary system improvements.

7.5.2 Additional Improvements

The KID has identified other capital improvements necessary to upgrade existing facilities to provide increased operational efficiency, greater margins of safety, address emergency preparedness issues and to decrease maintenance costs. Additional capital improvements are shown in Table 7-4.

**TABLE 7-4**  
**ADDITIONAL IMPROVEMENTS AS IDENTIFIED BY THE**  
**KINNELOA IRRIGATION DISTRICT**

<b>Description</b>
Upgrade SCADA hardware, software and communications radios to prevent obsolescence [OPS]
Provide power at the Brown Reservoir and install earthquake sensors and automatic shutoff valves and add telemetry equipment to the SCADA system to monitor conditions at this reservoir. [EP and OPS]
Replace Uniclor with Chortec chlorine generators. [OPS]
Purchase 57kw trailer-mounted generator to be used at Glen Reservoir and Sage Tank [EP]
Purchase 250kw trailer-mounted generator to be used and Wilcox and K-3 [EP]
Purchase 20kw generator for office [EP]
<b>EP= Emergency Preparedness</b> <b>OPS= Operations Improvement</b>

**KINNELOA IRRIGATION DISTRICT**  
**WATER MASTER PLAN**

**8.0 Planned Maintenance Program**

The KID has developed a Planned Maintenance Program for the KID’s water distribution system which extends the life of existing capital improvements. These items of work include pump overhauls, motor overhauls and replacements, reservoir recoating, reservoir roof repairs, upgrade interconnections with other agencies, purchase of small tools, upgrading various facilities, and office improvements. The items of work identified in this section are typically referred to as operations and maintenance items but due to relatively high cost they need to be budgeted in the same manner as capital improvements. Planned maintenance items identified by the staff are listed in Table 8-1 and are not in priority order.

**TABLE 8-1**  
**PLANNED MAINTENANCE PROGRAM ITEMS**

Item	Description	Est. Cost
1	Install Eye Wash Stations at six locations per JPIA request	\$3,000
2	Glen Reservoir - Install Polypropylene Liner – Add protective sealer to roof to extend cap sheet	\$ 30,000
3	Upgrading of Fire Hydrant Heads (\$ 500.00 to \$2,500 ea.)	\$34,000
4	Tunnel Maintenance (avg. \$ 7,000 per year) (amount is for a 10 year period)	\$70,000
5	Valve Maintenance (replacement cost averages \$2,500 per valve)	\$25,000
6	Vosburg Reservoir – Add protective sealer to roof	\$ 15,000
7	Upgrade of Interconnections with the City of Pasadena	\$75,000
8	Office Maintenance & Improvements: 1. Replace carpet and do interior painting; 2. Add storage shed to exiting concrete pad	\$40,000
9	Brown Reservoir – Roof – add protective sealer to extend cap sheet -- Install liner	\$30,000
10	Holly Tanks Erosion Control (All Phases)	\$140,000
11	Holly Boosters - Paint Booster Station	\$1,000
12	Glen Well – Remove & Replace protective wood cover with metal cap	\$ 6,000
13	Wilcox Reservoir – Pump stand/other repairs - permanent connections for portable pump	\$25,000
14	Vosburg Reservoir - Expand and repave asphalt driveway and east side of reservoir	\$40,000
15	Service Area – Emergency prep. - install or Replace “Blue Dot” Markers for Fire Hydrants	\$1,000
16	Wilcox Well – Modify dump line to dispose of water on site	\$1,000
	<b>Total</b>	<b>\$536,000</b>

**KINNELOA IRRIGATION DISTRICT**  
**WATER MASTER PLAN**

**9.0 PROJECT PRIORITIES**

Project priorities are based upon cost-benefit considerations. In other words, projects that will realize higher revenues per unit cost are given a higher priority than projects that will realize lower revenue, or no revenue, per unit dollar spent. Priorities are also based upon increased fire protection, increased operational efficiencies and lower maintenance costs. Projects are listed in Table 9-1 in order of decreasing priority in each project category.

**TABLE 9-1**  
**CAPITAL IMPROVEMENT PROJECTS LISTED BY PRIORITY**

Priority	Project	Description
1	Pipeline	In Front of 3136 Mesaloe Lane to Intersection of Mesaloe Lane and Kinneloa Mesa Road
2	Pipeline	In Front of 2985 Meyerloa Lane to Intersection of Meyerloa Lane and Kinneloa Mesa Road
3	Pipeline	Intersection of Kinneloa Mesa Road and Clarmeya Lane to in Front of 2924 Clarmeya Lane
4	Pipeline	Intersection of Kinneloa Mesa Road and Lindaloe Lane to in Front of 2925 Lindaloe Lane
5	Pipeline	Intersection of Kinneloa Mesa Rd. & Doyne Road to 3069 Doyne Rd.
6	Pipeline	Replace service main in Edgecliff Lane from Villa Knolls Drive to cul-de-sac
7	Pipeline	Replace service main in East Fairpoint Street from Sierra Madre Villa Avenue to the last service
8	Pipeline	Country Lane to Southeast Corner of 1747 Country Lane
9	Pipeline	Kinclair Drive to rear of 2150 Kinclair Drive
10	Pipeline	Kinclair Drive to #4 Cricklewood Path
11	Pipeline	Kinneloa Canyon Road to rear of 2044 Piccadilly Lane
12	Pipeline	Intersection of Vosburg Street and lower Pasadena Glen Road to front of 1658 Pasadena Glen Road
13	Pipeline	1900 Windover Road to Corner of 2090 and 2060 Villa Heights Road
14	Pipeline	1908 N. Kinneloa Cyn. Rd. to intersection of Larmona Drive & Kinneloa Mesa Road (Doyne Road project)
15	Pipeline	New Connection to Vosburg Reservoir
16	Pipeline	Sierra Madre Villa Avenue to 2014 Windover Road
17	Pipeline	Windover Road in Sierra Madre Villa Avenue to Vosburg Street
18	Pipeline	Replace service main from Villa Knolls Drive to end of Hartwood Point Drive
19	Pipeline	Replace service main in Villa Mesa Drive from Sierra Madre Villa Avenue to 3336 Villa Mesa Drive

<b>Priority</b>	<b>Project</b>	<b>Description</b>
20	Pipeline	From Glen Reservoir to intersection of Villa Highlands and Sierra Madre Villa. Includes slope from Pasadena Glen to Barhite
21	Pipeline	West Tank to East Tank
22	Pipeline	Replace water main from Wilcox Well to Wilcox Reservoir
1	Tunnel	Construct permanent replacement pipeline section from High Pressure Tunnel to Holly and/or Sage Reservoir
2	Tunnel	Construct pipeline from lower Low Pressure Tunnel to junction with High Pressure Tunnel Pipeline north of Kinneloa Debris Basin
1	Booster	Replace the existing 50 HP oil lubricated booster pump at Wilcox Reservoir with a water lubricated pump
2	Booster	Install additional booster pump and new electrical (at Wilcox Reservoir). (for Doyne Road project)
3	Booster	Replace existing booster pump at Glen Reservoir with a higher capacity unit
4	Booster	Replace existing booster pumps at Holly Tank with vertical turbine pumps in a can
1	Other (Telemetry)	Provide additional telemetry to SCADA system for Brown Reservoir
2	Other (Reservoir)	Install earthquake sensor and automatic shutoff valve at Brown Reservoir
3	Other (Emergency Preparedness)	Purchase 57kw trailer-mounted generator for Glen Reservoir
4	Other (Emergency Preparedness)	Purchase 250kw trailer-mounted generator for Wilcox and K-3
5	Other (Emergency Preparedness)	Purchase 20kw generator for office



**KINNELOA IRRIGATION DISTRICT**  
**WATER MASTER PLAN**

**10.0 COST ESTIMATES FOR REQUIRED IMPROVEMENTS**

**10.1 *Pipelines***

Cost estimates for pipeline replacements as described in Section 7.1, are taken from a study prepared by ASL Consulting Engineers for the KID in April 1996. Cost estimates were up-dated in July 2002 and adjusted for inflation and current construction costs in 2007. Nearly all of the replacement pipelines are needed to meet 1,250 gpm fire flow and 450 feet vehicular distance requirements. Category definitions are as follows: EP-Emergency Preparedness; PM-Preventive Maintenance; OPS- Operational Improvement. The estimated costs are shown in Table 10-1. All costs are in 2007 dollars. In order for the district to get the best prices for these projects, the projects should be bundled in dollar amounts not less than \$150,000.

**TABLE 10-1**  
**PIPING IMPROVEMENTS COST ESTIMATES**

Priority	Main Size	Description		Category	Cost
		From	To		
1	8"	Intersection of Meyerloa Ln. & Kinneloa Mesa Rd.	Front of 2985 Meyerloa Ln.	EP/PM 425 ft.	\$70,000
2	8"	Intersection of Kinneloa Mesa Rd. & Clarmeya Ln.	Front of 2924 Clarmeya Ln.	EP/PM 230 ft.	\$50,000
3	8"	Intersection of Kinneloa Mesa Rd. & Lindaloe Ln.	Front of 2925 Lindaloe Ln.	EP/PM 425 ft.	\$70,000
4	8"	Intersection of Kinneloa Mesa Rd. & Doyne Rd.	Front of 3069 Doyne Rd. (Doyne Rd. Project)	EP/PM 380 ft.	\$50,000
5	8"	Edgecliff Lane from Villa Knolls	End of Cul-de-sac	EP/PM 700 ft.	\$80,000
6	4"	Last service on Fairpoint	Sierra Madre Blvd.	PM 950 ft.	\$84,000
7	8"	Country Lane	Southeast Corner of 1747 Country Lane	EP 270 ft.	\$28,000
8	8"	Kinclair Dr.	Rear of 2150 Kinclair Dr.	EP 250 ft.	\$38,000

Priority	Main Size	Description		Category	Cost
		From	To		
9	8"	Kinclair Dr.	#4 Cricklewood Path	EP 400 ft.	\$50,000
10	8"	Kinneloa Canyon Rd.	Rear of 2044 Piccadilly Ln.	EP 250 ft.	\$38,000
11	8"	Intersection of Vosburg St. & Lower Pasadena Glen Rd.	Front of 1658 Pasadena Glen Rd.	EP/PM 350 ft.	\$48,000
12	8"	1900 Windover Road	Corner of 2090 and 2060 Villa Heights Road	EP 1840 ft.	\$188,000
13	8"	Larmona Drive & Kinneloa Mesa Road	1908 N. Kinneloa Canyon Rd.(Doyne Rd. Project)	EP	\$204,000
14	12"	New Connection at Vosburg Reservoir		EP/PM	\$26,000
15	16"	Sierra Madre Villa at Windover Road	Vosburg Reservoir	EP/PM 1000 ft.	\$184,000
16	10"	Windover Road & Sierra Madre Villa	Vosburg Street	EP/PM 1010 ft.	\$134,000
17	8"	Villa Knolls Drive	End of Harwood Point	EP/PM 1960 ft.	\$204,000
18	8"	Sierra Madre Villa	3336 Villa Mesa	EP/PM 300 ft.	\$42,000
19	12"	Glen Reservoir	Intersection Villa Highlands & Sierra Madre Villa Includes Slope from Pasadena Glen to Barhite	EP/OPS 3100 ft.	\$442,000
20	10"	West Tank	East Tank	EP/OPS 5000 ft.	\$1,150,000
21	10"	Wilcox Well	Wilcox Reservoir Line	EP/OPS/PM 500 ft.	\$60,000
<b>SUBTOTAL</b>					<b>\$2,778,000</b>
Engineering, Design, and Planning					\$200,000
Construction Management and Inspection					\$150,000
<b>SUBTOTAL</b>					<b>\$350,000</b>
<b>TOTAL PIPELINE PROJECTS</b>					<b>\$3,128,000</b>

## 10.2 *Booster Pump Station Improvements*

Cost estimates for installation of booster pump improvements required for the Doyne Road Development (Tract 44323) were developed in a report prepared by ASL Consulting Engineers for the KID and dated June 3, 1996. Cost estimates were up-dated

in February 2002 but are not included in the KID capital project budget as they will be constructed at the developer's expense if the developer proceeds with the project.

Cost estimates for installation of other booster pump improvements were developed in a report prepared by ASL Consulting Engineers for the KID and dated November 3, 1995. Cost estimates were up-dated in February 2002. Although some of these projects are being deferred because of the purchase of portable pumps, they are listed for planning purposes in the event that the portable pumps are used for other purposes. Costs for improvements to the booster pumps at the Wilcox Reservoir, Glen Reservoir, Holly Tank and the Vosburg Reservoir are included in the KID capital project budget. Costs include engineering, inspection, management and contingency. All costs were updated in 2002 and have been adjusted for inflation to 2007 dollars.

Booster Pump Station Improvements are shown in Table 10-2.

**TABLE 10-2  
BOOSTER PUMP STATION IMPROVEMENTS**

Priority	Description	Estimated Costs
N/A	Construct new 50 HP booster pump at Wilcox Reservoir (Tract 44323)	By Developer
1	Replace the existing 50 HP oil lubricated booster pump at Wilcox Reservoir with a water-lubricated pump.	\$10,000.00
2	Construct improvements to the Booster Pump at Glen Reservoir	\$60,000.00*
3	Construct improvements to the Booster Pump at Vosburg Reservoir	\$60,000.00*
4	Construct improvements to the Booster Pumps at Holly Tanks	\$60,000.00*

\*Deferred by purchase of portable pumps

### 10.3 *Tunnel Improvements*

The pipeline from the upper Low Pressure Tunnel face to the new High/Low combiner was replaced in 2006. The existing High Pressure pipeline was not replaced but the line was suspended from a new cable to the combiner to protect it from landsides. The lower Low Pressure Tunnel pipeline was not replaced since there was no water exiting that tunnel at the time of the construction work in 2006. The combined High/Low Pressure pipeline from the combiner to the Kinneloa Canyon West Debris Basin may also need to be replaced in future years. The cost estimates for the remaining pipelines are shown in Table 10-3.

**TABLE 10-3**  
**TUNNEL IMPROVEMENTS**

<b>Priority</b>	<b>Description</b>	<b>Cost Estimate</b>
1	Replace the combined High/Low Pressure Tunnel Pipeline from combiner to Kinneloa Canyon West Debris Basin	\$200,000.00
2	Replace the lower Low Pressure Tunnel Pipeline	\$ 61,000.00
3	Replace other tunnel pipelines as required	\$100,000.00

10.4 *Costs of Other Improvements*

Cost estimates for the construction or purchase of other improvements are based upon estimates by KID staff and are shown in Table 10-4.

**TABLE 10-4**  
**OTHER IMPROVEMENTS**

<b>Priority</b>	<b>Description</b>	<b>Estimated Cost</b>
1	Upgrade SCADA hardware, software and communications radios to prevent obsolescence	\$50,000
2	Install solar power, SCADA, earthquake sensor and automatic shutoff valve at Brown Reservoir.	\$50,000
3	Replace Uniclor with Chortec chlorine generators	\$10,000
4	Purchase 57kw portable generator for Glen Reservoir	\$18,000
5	Purchase 250kw portable generator for Wilcox and K-3	\$40,000
6	Purchase 20kw generator for office	\$10,000

10.5 *Total Costs*

Table 10-5 shows total estimated costs for all necessary improvements as identified in this master plan. Cost estimates include design, inspection, construction management and contingency costs. Improvements identified to be installed and financed by developers are not included. Costs for the items identified as other work were developed for this master plan from cost estimates by the KID staff.

**TABLE 10-5**  
**TOTAL ESTIMATED COSTS**

<b>No.</b>	<b>Description</b>	<b>Cost Estimate</b>
1	Pipeline Improvements	\$3,128,000
2	Pump Station Improvements	\$190,000
3	Tunnels	\$321,000
4	Other Improvements	\$178,000
5	Planned Maintenance (from Section 8)	536,000
	<b>TOTAL</b>	<b>\$4,353,000</b>

# APPENDIX

**EXHIBIT I**  
**RESERVOIR IMPROVEMENTS**

## RESERVOIR IMPROVEMENTS

Cost estimates for District funded improvements to reservoirs are not included in the Water Master Plan. Should funding become available consideration of these projects will be re-evaluated.

### Existing Reservoirs

In April 1996, ASL Consulting Engineers conducted a study for the KID to identify reservoir improvements, which would have to be made to comply with the KID Fire Preparedness Policy. The results of that study indicate that additional capacity is required at the Holly Tanks, Glen Reservoir and East Tank.

Table I compares the required future reservoir storage capacity with the existing reservoir capacity for each service zone. Wilcox Reservoir is a forebay for the Wilcox Well and is not included. Required capacity is the sum of maximum day demand, operational capacity, and fire flow.

**TABLE I  
REQUIRED RESERVOIR CAPACITY**

Reservoir	Maximum Day Demand (Gal.) *	Operational Capacity (Gal.) ****	Fire Flow (Gal.) **	Required Capacity (Gal.)	Existing Capacity (Gal.)	Additional Capacity Required (Gal.)
Eucalyptus Reservoir	308,160	77,000	300,000	685,160	180,000	505,160
Holly/Sage Tanks	702,720	176,000	300,000	1,178,720	525,000	653,720
East Tank	230,400	58,000	300,000	588,400	150,000	438,400
West Tank****	135,360	0***	300,000	435,360	500,000	0
Brown/Glen Reservoir	298,080	72,000	300,000	670,080	250,000	420,080
Vosburg Reservoir	643,680	161,000	300,000	1,104,680	1,250,000	0

- \* Maximum Day Demand = 60 min. x 24 hours x max day demand (gpm/service).
- \*\* Fire Flow = 1,250 gpm for 4 hours.
- \*\*\* Operational storage not required.
- \*\*\*\* West Tank Maximum Day Demand based on (gpm/acre).
- \*\*\*\*\* 25% of maximum day demand.

The proposed reservoir improvements are shown in Table II



**TABLE II**  
**PROPOSED RESERVOIR IMPROVEMENTS**

<b>Tank</b>	<b>Description</b>
Holly Tanks*	Remove both existing reservoir in two stages. Construct new concrete reservoir in two stages and miscellaneous site improvements. Increase existing Holly Tanks to provide total 1-MG storage.
East Tank	Site has 1 existing 0.15 MG reservoir. Add two additional 0.15 MG steel reservoirs and miscellaneous site improvements. Site limitations prevent construction of total required storage. Maximum day operation will require careful management of operational levels with potential of encroaching on peak pumping Edison rate.
Glen Reservoir**	Demolish existing 0.15 MG reservoir. Construct new 0.5 MG concrete reservoir and miscellaneous site improvements.
Eucalyptus Reservoir	Emergency connections, portable pumps and tunnel supply are considered to make up storage deficit.

\* Considers moving Holly Tanks to East Tank site.

\*\* Third priority because Glen Reservoir has back up in Vosburg Reservoir.

Cost estimates for District funded improvements to reservoirs were developed in a study by ASL Consulting Engineers for the KID and dated April 1996. The Estimated cost for improvements to Holly Tanks, East tanks, and Glen Reservoir are shown in Tables III, IV, and V respectively. All costs are in 1996 dollars.

**TOTAL ESTIMATED COSTS**

<b>No.</b>	<b>Description</b>	<b>Cost Estimate</b>
1	Holly Reservoir Improvements	\$612,000
2	East Tank Improvements	\$422,000
3	Glen Reservoir Improvements	\$624,000
	<b>Total Reservoir Improvements</b>	<b>\$1,658,000</b>

**Table III**  
**HOLLY RESERVOIR IMPROVEMENTS COST ESTIMATE**

Item	Quantity	Unit	Description	Unit Price	Total Price
<b>PHASE I</b>					
1	1	L.S.	Mobilization/Demobilization	\$6,750.00	\$6,750.00
2	1	L.S.	Modify Existing Inlet/Outlet and Tunnel Well Piping	\$5,000.00	\$5,000.00
3	1	L.S.	Demolish and Remove West Reservoir	\$25,000.00	\$25,000.00
4	275	L.F.	Install Excavation Shoring, Entire Site	\$30.00	\$8,250.00
5	900	C.Y.	Excavate Entire Site	\$30.00	\$27,000.00
6	1	L.S.	Install Sub drain System	\$4,000.00	\$4,000.00
7	1	L.S.	Install Inlet/Outlet Piping	\$3,000.00	\$3,000.00
8	1	L.S.	Construct West Half of New Reservoir	\$200,000.00	\$200,000.00
9	1	L.S.	Test, Disinfect, and Place West Half of Reservoir in Service	\$2,000.00	\$2,000.00
<b>PHASE II</b>					
1	1	L.S.	Demolish and Remove East Reservoir	\$25,000.00	\$25,000.00
2	1	L.S.	Install Sub drain System	\$4,000.00	\$4,000.00
3	1	L.S.	Install Inlet/Outlet Piping	\$5,000.00	\$5,000.00
4	1	L.S.	Construct East Half of New Reservoir	\$200,000.00	\$200,000.00
5	1	L.S.	Test, Disinfect, and Place East Half of Reservoir in Service	\$2,000.00	\$2,000.00
6	200	C.Y.	Backfill and Remove Shoring	\$50.00	\$10,000.00
7	1	L.S.	Construct Site Improvements, A.C. Pavement, Landscaping and Irrigation, and Site Drainage Facilities	\$15,000.00	\$15,000.00
<b>SUBTOTAL</b>					<b>\$542,000.00</b>
Engineering Design and Planning					\$30,000.00
Soils Investigation					\$10,000.00
Environmental Documents					\$10,000.00
Construction Administration and Inspection					\$20,000.00
<b>SUBTOTAL</b>					<b>\$70,000.00</b>
<b>TOTAL PROJECT</b>					<b>\$612,000.00</b>

**Table IV**  
**EAST TANK IMPROVEMENTS COST ESTIMATE**

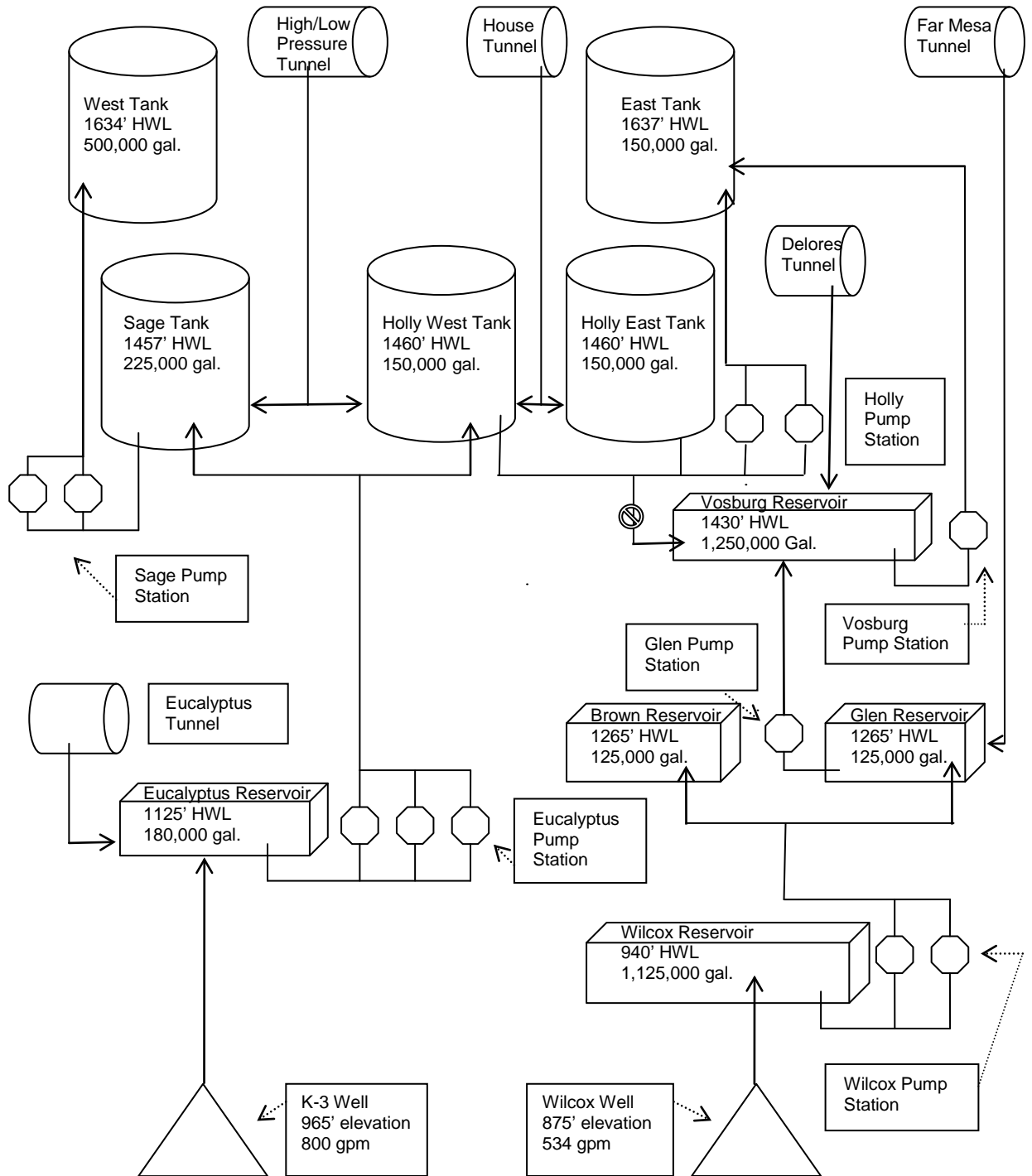
<b>Item</b>	<b>Quantity</b>	<b>Unit</b>	<b>Description</b>	<b>Unit Price</b>	<b>Total Price</b>
1	---	L.S.	Mobilization/Demobilization	\$5,000.00	\$5,000.00
2	1,300	C.Y.	Excavation / Grading	\$50.00	\$65,000.00
3	---	L.S.	Access Road – Grading and Paving	\$22,000.00	\$22,000.00
4	2	EA.	Tank Footing and Oil Sand	\$15,000.00	\$30,000.00
5	---	L.S.	Sub drain System	\$10,000.00	\$10,000.00
6	---	L.S.	Slope Treatment	\$15,000.00	\$15,000.00
7	---	L.S.	Site Drainage	\$30,000.00	\$30,000.00
8	2	EA.	Tank Material and Construction	\$75,000.00	\$150,000.00
<b>SUBTOTAL</b>					<b>\$327,000.00</b>
Engineering Design and Planning					\$25,000.00
Soils Investigation					\$15,000.00
Environmental Documents					\$15,000.00
Construction Management and Inspection					\$40,000.00
<b>SUBTOTAL</b>					<b>\$95,000.00</b>
<b>TOTAL PROJECT</b>					<b>\$422,000.00</b>

**Table V**  
**GLEN RESERVOIR IMPROVEMENTS COST ESTIMATE**

<b>Item</b>	<b>Quantity</b>	<b>Unit</b>	<b>Description</b>	<b>Unit Price</b>	<b>Total Price</b>
1	1	L.S.	Mobilization/Demobilization	\$6,000.00	\$6,000.00
2	1	L.S.	Temporary Relocation of Long Tunnel Pipeline	\$2,000.00	\$2,000.00
3	1	L.S.	Salvage Pump, Electrical, and Chlorination Equipment	\$6,000.00	\$6,000.00
4	1	L.S.	Demolish A.C. Pavement	\$2,000.00	\$2,000.00
5	1	L.S.	Demolish and Remove Existing Reservoir Structure and Appurtenances	\$35,000.00	\$35,000.00
6	300	L.F.	Install Excavation Shoring	\$30.00	\$9,000.00
7	1,900	C.Y.	Excavate Reservoir Pad	\$35.00	\$66,500.00
8	1	L.S.	Install Sub drain System	\$8,000.00	\$8,000.00
9	1	L.S.	Install Reservoir Inlet/Outlet and Drain Piping	\$5,000.00	\$5,000.00
10	1	L.S.	Construct Reservoir	\$350,000.00	\$350,000.00
11	1	L.S.	Test, Disinfect, and Place Reservoir in Service	\$3,000.00	\$3,000.00
12	1	L.S.	Backfill and Grade Site	\$7,000.00	\$7,000.00
13	1	L.S.	Install Chlorination, Pump, and Electrical Equipment	\$15,000.00	\$15,000.00
14	1	L.S.	Construct Site Improvements, A.C. Pavement, Landscaping, and Irrigation	\$10,000.00	\$10,000.00
<b>SUBTOTAL</b>					<b>\$524,500.00</b>
Engineering Design and Planning					\$45,000.00
Soils Investigation					\$10,000.00
Environmental Documents					\$15,000.00
Construction Management and Inspection					\$30,000.00
<b>SUBTOTAL</b>					<b>\$100,000.00</b>
<b>TOTAL PROJECT</b>					<b>\$624,500.00</b>

**EXHIBIT I I**  
**SCHEMATIC OF WATER SYSTEM**

# KINNELOA IRRIGATION DISTRICT HYDRAULIC SCHEMATIC



**EXHIBIT III**  
**FIRE PREPAREDNESS POLICY**

**FIRE PREPAREDNESS POLICY**  
**FOR**  
**THE KINNELOA IRRIGATION DISTRICT**

Prepared for

The Kinneloa Irrigation District  
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Pasadena, CA 91107  
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Prepared by:

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February 1997

Revised by:

Melvin L. Matthews  
General Manager

April 2005



# **KINNELOA IRRIGATION DISTRICT**

## **FIRE PREPAREDNESS POLICY**

### **INTRODUCTION**

The Kinneloa Irrigation District (KID) provides water service to approximately 500 acres of hillside customers in northeast Pasadena. The Angeles National Forest borders the District on the north. Under certain weather conditions, wild fire danger is extremely high. Santa Ana winds have the capability to drive wild fires into the District with potential to cause major damage. The 1993 Altadena wild fire was the latest example of the potential fire danger. There are many factors that contributed to the Altadena wildfire damage. These factors are as follows:

- The availability of water for fire protection.
- Fuel source availability.
- Coordination of manpower.
- Equipment deployment.
- Limited ingress and egress.
- Fire preparedness.

Complete protection from major natural disasters such as wild fires is extremely difficult to provide. Preparation for all possible contingencies is impossible. The KID has determined that there are some water issues that exceed standard fire protection measures that may reduce wild fire damage to the community. These measures as applicable to the KID are identified in the KID Fire Preparedness Policy (FPP). The FPP issues identified are not necessarily immediately achievable. The FPP measures identified are a goal to be achieved to minimize future wild fire damage to the KID community.

The existing District facilities provide the level of structure fire protection originally intended. Recent wild fire events have identified several areas where water system performance above original design standards and in some cases additional capacities above current standards would be prudent. The FPP is an attempt to identify these areas and set goals to achieve reasonable standards.

The FPP identifies goals in four areas. These areas are as follows:

- Reservoir storage to maintain gravity supply to the distribution system for each pressure zone.
- Distribution piping to deliver the water supply to all areas of the District.
- Pumping capacity to supplement reservoir storage and transfer water to higher zones when necessary.
- Operational guidelines necessary to maximize system performance and minimize water loss during a wild fire event.

Following is a detailed discussion of each goal:

## 1. Reservoir Storage

The FPP reservoir storage goal is to provide storage in each zone to supply fire flow to multiple fire hydrants simultaneously in addition to customer demand. Fire flow storage goal is to provide 1,250 gpm at two locations for duration of two hours (300,000 gallons) plus 20 gpm for each customer for two hours (2,400 gallons per customer). The following table identifies the reservoir fire flow storage goals for each zone. Total services include planned developments.

<b>Service Zone</b>	<b>Total Services</b>	<b>Customer Demand (gallons)</b>	<b>Fire Storage (gallons)</b>	<b>FPP Goal (gallons)</b>	<b>Existing Storage (gallons)</b>
Eucalyptus Zone	62	148,800	300,000	448,800	180,000
Holly/Sage Zone	205	492,600	300,000	792,600	525,000
East Tank Zone	61	146,800	300,000	446,800	150,000
West Tank Zone	25	60,000	300,000	360,000	500,000
Brown/Glen Zone	77	184,800	300,000	484,800	250,000
Vosburg Zone	195	468,000	300,000	768,000	1,250,000

Note: FPP storage goal does not include reservoir operational storage. The FPP reservoir storage goal will be accomplished through new reservoir construction resulting from development and/or replacement or reconstruction of existing reservoir facilities.

## 2. Distribution Piping

The FPP distribution piping goal is to improve the distribution piping network to increase the delivery capability to all fire hydrants and customer services. The original system design required capability of delivering 750 gallons per minute of water to a single fire hydrant. The current distribution piping has the capability to meet this requirement. Flow requirements have been increased by revisions to the County Fire Department regulations. New construction within the District requires a minimum of 1,250 gpm flow for 2 hour duration.

The FPP goal is to improve the distribution system piping within each service zone to provide 1,250 gpm flows to two fire hydrants flowing simultaneously, plus a flow of 20 gpm for each customer service within the service zone. This goal is not immediately achievable. The goal will be accomplished by adequately sizing new water mains and replacing existing mains as required due to system modifications and pipe deterioration due to age. Additional fire hydrants will be added where required to meet the revised Los Angeles County requirement of 450 feet maximum vehicular distance to structures.

## 3. Pumping Capacity

The FPP pumping capacity goal is to improve the reliability, efficiency, and capacity of the District's pumping facilities. The existing pumping facilities have adequate capacity to provide maximum day domestic demands. Tunnel well water is required to meet maximum day domestic demand for some zones. Development of additional customer services will increase demand above current pumping capacities. Additional pumping capacity is required to meet the additional demands.

The FPP pumping capacity goal is to improve pumping facilities to the following standards:

- A. Pumping capacity for each zone will be sufficient to pump maximum day demand during Edison Company off-peak demand 16-hour daily pumping period.
- B. Pumping capacity will be sufficient to replace fire flow storage within a minimum of one 24-hour period.
- C. Pump facilities for each zone will include a minimum of two pumps:
  - One (1) Duty
  - One (1) Standby

There will be an alternative for larger capacity facilities having three pumps:

- Two (2) Duty
- One (1) Standby

Pumps will be high efficiency vertical turbine pumps, with pump can manifold, aboveground discharge, and pump control valve check valves to minimize system pressure surges. Each facility will include provisions for emergency generator lug connections. Emergency generator shall provide power to a minimum of one Duty pump. Pump station piping shall include provisions for bypass valve and bypass connections for fire engine pumping equipment or portable emergency pumping equipment.

The FPP goal will be accomplished by applying the above standards to all new pumping facility designs and upgrading existing facilities to above standards when capacity modifications are required or when pumping equipment is replaced.

#### **4. System Operational Guidelines**

The FPP guidelines were developed from discussions with KID staff focusing on the 1993 wild fire incident. The goal of the operational guidelines is to make efficient use of the water supply to protect the KID customers and maximize fire department suppression capabilities. In the event of wild fire danger, the KID staff will attempt to implement the following guidelines:

- A. General Manager or Facilities Supervisor will coordinate water system operation with fire department deployment of manpower and equipment.
- B. Whenever possible, KID staff will attempt to minimize water waste by stopping visible leaks from damaged structures and/or irrigation systems. Water service to damaged structures and/or irrigation system may be turned off.
- C. Fire department pumping equipment may be deployed and connected to inter zone transfer facilities.
- D. Bypass valves or pumping facilities may be operated as required to make up reservoir storage losses. Transfers between zones will be made only when necessary and only when transfer will not deplete zone storage below levels required to provide adequate fire protection. Transfer of water between zones will be at the discretion of the General Manager or Facilities Supervisor.

- E. District emergency portable generator will be maintained and tested monthly and placed in service when required to provide emergency power for pumping when anticipated power failure is expected for a duration of more than 2 hours. Additional emergency generators will be provided at the discretion of the General Manager or Facilities Supervisor.
  
- F. District's two portable pumps will be maintained and tested monthly and placed in service when prolonged power outages and/or failure of booster pumps require the use of the pumps to maintain adequate reservoir storage levels.

## 2007 AGED RECEIVABLES REPORT

BILLING MONTH	TOTAL BALANCE	CURRENT PERIOD	OVER 30 DAYS	OVER 60 DAYS	OVER 90 DAYS	OVER 120 DAYS	Penalty Charges	Interest Charges
JANUARY	\$86,623.01	\$72,115.06 589 Accts.	\$10,971.45 96 Accts.	\$2,550.19 18 Accts.	\$420.20 3 Accts.	\$566.11 1 Acct.	\$540.00 36 Accts.	\$89.51
FEBRUARY	\$98,355.41	\$82,223.34 581 Accts	\$11,964.87 97 Accts.	\$2,271.24 16 Accts.	\$930.05 5 Accts..	\$965.91 2 Accts.	\$420.00 28 Accts.	\$54.81
MARCH	\$83,625.53	\$72,088.60 579 Accts.	\$8,278.16 89 Accts.	\$1,113.11 15 Accts	\$812.92 3 Accts.	\$1,332.74 3 Accts.	\$225.00 15 Accts	\$27.79
APRIL	\$87,971.93	\$76,059.53 579 Accts.	\$9,204.88 81 Accts	\$745.45 14 Accts	\$254.51 3 Accts.	\$1,707.68 3 Accts.	\$240.00 16 Accts.	\$21.40
MAY	\$109,016.80	\$93,932.84 579 Accts.	\$12,135.54 101 Accts.	\$1,036.56 13 Accts.	\$113.52 3 Accts.	\$1,798.34 2 Accts.	\$405.00 27 Accts	\$30.65
JUNE	\$118,584.94	\$98,710.80 577 Accts.	\$15,598.95 106 Accts.	\$2,320.03 18 Accts.	\$75.26 2 Accts.	\$1,879.90 2 Accts.	\$570.00 38 Accts	\$49.52
JULY	\$152,599.07	\$134,874.00 581 Accts.	\$14,412.70 95 Accts.	\$2,087.64 19 Accts.	\$106.85 4 Accts.	\$1,117.88 2 Accts.	\$435.00 29 Accts.	\$45.31
AUGUST	\$112,838.57	\$86,388.44 577 Accts.	\$21,707.03 104 Accts	\$3,383.74 25 Accts,	\$170.52 3 Accts.	\$1,188.84 2 Accts.	\$670.00 39 Accts.	\$69.52
SEPTEMBER	\$124,469.55	\$111,746.19 582 Accts	\$9,643.04 60 Accts	\$1,495.70 12 Accts.	\$225.26 3 Accts.	\$1,359.36 3 Accts.	\$345.00 23 Accts	\$61.73
OCTOBER	\$125,338.41	\$99,265.76 581 Accts.	\$21,314.45 119 Accts.	\$3,164.11 17 Accts	\$99.90 2 Accts.	\$1,494.19 2 Accts.	\$435.00 33 Accts	\$68.50
NOVEMBER	\$125,368.77	\$98,505.69 584 Accts	\$19,699.31 118 Accts	\$4,573.48 30 Accts.	\$1,868.21 9 Accts.	\$722.08 1 Acct.	\$450.00 30 Accts.	\$74.15
DECEMBER	\$86,100.54	\$67,610.14 580 Accts.	\$14,222.13 108 Accts.	\$2,943.28 27 Accts.	\$497.98 9 Accts.	\$827.01 2 Accts.	\$840.00 56 Accts.	\$110.57
						<b>Totals</b>	\$5,575.00	\$703.46

**Kinneloa Irrigation District**  
**CAPITAL PROJECTS**  
**For the Period From Jan 1, 2006 to Dec 31, 2007**

Filter Criteria includes: 1) IDs from 2006 Chlorine Analyz to 2007 Office. Report order is by ID. Report is printed with Accounts having Zero Amounts and including Balance Forward.

Job ID	GL Acct Description	Trx Date	Trans Description	Amount	Totals	Est Expenses
2006 Chlorine Analyz	WaterTreatment Plant	7/27/06	A&B Electric - K-3 Chlorine Analyzer and feed pump install	3,320.25		
		12/15/06	Matt Chlor Inc. - Cl2 analyzer for wilcox well	2,516.15		
		3/12/07	Matt Chlor Inc. - Chlorine Residual Analyzer	2,519.15		
		3/27/07	Matt Chlor Inc. - Chlorine Analyzer	2,519.15		
		4/13/07	A&B Electric - install receptacle for Chorine Analyzer at Glen Reservoir	296.45		
	Electrical/Electronic E	1/24/07	A&B Electric - Wilcox Well electrical	1,630.00		
		1/24/07	A&B Electric - Wilcox Well electrical	234.23		
	SCADA	4/3/06	Matt Chlor Inc. - chlorine analyzer	2,511.17		
		7/20/06	Matt Chlor Inc. - Chlorine Analyzer in NEMA 4X enclosure	3,613.85		
		10/9/06	Matt Chlor Inc. - Chlorine residual anlyzer	2,519.15		
		6/21/07	Byrd Industrial Electronics - Eucalyptus SCADA upgrade for Cl2 installation	1,674.63		
	Outside Services	9/15/06	A&B Electric - Chlorine tank level hookup to SCADA	644.07		
					<b>23,998.25</b>	
	<b>2006 Chlorine Analyz</b>				<b>23,998.25</b>	<b>15,000.00</b>
	2006 Electrical	Electrical/Electronic E	1/24/07	A&B Electric - East Tank electrical	8,124.00	
1/25/07			A&B Electric - East Tank Electrical	3,336.30		
Tanks and Reservoirs		8/17/06	A&B Electric - East Tank Power Pole	3,650.00		
		6/15/07	A&B Electric - eucalyptus electrical upgrade for flo-loc and chlorine analyzer	3,078.00		
					<b>18,188.30</b>	
<b>2006 Electrical</b>				<b>18,188.30</b>	<b>20,000.00</b>	
2006 Flo-Loc	Electrical/Electronic E	10/25/06	A&B Electric - Holly Tank electrical work	8,176.12		
		1/1/07	A&B Electric - vosburg electrical	8,184.36		
		1/1/07	A&B Electric - Vosburg electrical (continued) upgrades	6,468.52		
	Tanks and Reservoirs	7/12/06	Flo-Loc, Inc. - Holly East Tank	23,078.00		
		7/12/06	Flo-Loc, Inc. - Holly West Tank	13,528.00		
		9/22/06	Flo-Loc, Inc. - Valve for Vosburg Reservoir	18,741.00		
		12/1/06	Flo-Loc, Inc. - East Tank	12,855.00		
		1/18/07	Flo-Loc, Inc. - Flo-Loc for Glen Reservoir	13,563.00		
		4/9/07	Flo-Loc, Inc. - valve for Eucalyptus	12,745.00		
		5/3/07	Flo-Loc, Inc. - brackets and vandal proof enclosure for Eucalyptus	1,702.00		
		5/25/07	Byrd Industrial Electronics - SCADA install at eucalyptus for Flo Loc and Chlorine Analyzer	3,003.00		
		6/21/07	Byrd Industrial Electronics - Eucalyptus SCADA upgrade for flo-loc installation	1,674.63		
		7/27/07	A&B Electric - Eucalyptus Reservoir electrical work for Flo-Loc install	5,963.00		

**Kinneloa Irrigation District**  
**CAPITAL PROJECTS**  
**For the Period From Jan 1, 2006 to Dec 31, 2007**

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Job ID	GL Acct Description	Trx Date	Trans Description	Amount	Totals	Est Expenses
	Maintenance Contract	10/25/06	A&B Electric - Holly Tank electrical work	4,991.00		
		6/8/07	Perry Thomas Construction Co., - Eucalyptus concrete pad for flo-loc	2,567.35		
	Outside Services	9/15/06	A&B Electric - Hook up Flo-Loc to SCADA	560.55		
					<b>137,800.53</b>	
<b>2006 Flo-Loc</b>					<b>137,800.53</b>	<b>118,000.00</b>
2006 Hi/Low Pressure	Water Tunnels	6/1/06	Civiltec Engineering, Inc. - FEMA tunnel repair engineering	320.00		
		11/7/06	Doty Bros. Equipment Co. - Hi-Low progress payment less retention	68,215.50		
		1/1/07	Doty Bros. Equipment Co. - Hi/Lo FEMA OES Project	79,428.09		
		3/29/07	Doty Bros. Equipment Co. - Hi/Lo tunnels final invoice less retention	36,776.73		
	Disaster Assistance	3/29/07	Doty Bros. Equipment Co. - Hi/Lo Tunnel retention	20,491.15		
		2/1/06	State of California-OES - FEMA/OES Disaster Assistance	-5,770.00		
		3/26/07	State of California-OES - FEMA/OES reimbursement	-9,940.00		
		3/31/07	Hi/Lo Tunnel- to post previous FEMA/OES Disaster Assistance to Job	-24,615.00		
		4/23/07	State of California-OES - Hi/Lo tunnel reimbursement	-38,930.00		
		6/1/07	State of California-OES - FEMA/OES reimbursement	-2,740.00		
		6/1/07	State of California-OES - FEMA/OES reimbursement	-87,045.00		
		8/22/07	State of California-OES - FEMA/OES reimbursement	-12,977.00		
		8/22/07	State of California-OES - FEMA/OES reimbursement	-3,425.00		
		8/22/07	State of California-OES - FEMA/OES reimbursement	-30,825.00		
		9/1/07	State of California-OES - Disaster Assistance	-3,313.00		
	Project Engineering	3/13/06	Civiltec Engineering, Inc. - High/Low Pressure Tunnel Plans	2,752.50		
		4/6/06	Civiltec Engineering, Inc. - FEMA project engineering-Hi-Lo tunnel	712.50		
		5/5/06	Civiltec Engineering, Inc. - Hi/Lo pressure tunnel repair engineering	640.00		
		5/5/06	Civiltec Engineering, Inc. - Hi/Lo pressure tunnel engineering	320.00		
		7/6/06	Civiltec Engineering, Inc. - FEMA tunnel project engineering	4,040.00		
		7/6/06	Civiltec Engineering, Inc. - Hi/Lo tunnel engineering	6,795.00		
					<b>911.47</b>	
<b>2006 Hi/Low Pressure</b>					<b>911.47</b>	<b>220,491.47</b>
2006 House Tunnel	Water Tunnels	6/1/06	Civiltec Engineering, Inc. - House Tunnel FEMA project engineering	160.00		
		6/1/06	Civiltec Engineering, Inc. - house tunnel engineering	712.50		

**Kinneloa Irrigation District**  
**CAPITAL PROJECTS**  
**For the Period From Jan 1, 2006 to Dec 31, 2007**

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Job ID	GL Acct Description	Trx Date	Trans Description	Amount	Totals	Est Expenses
		11/7/06	Doty Bros. Equipment Co. - House Tunnel progress payment less retention	29,025.00		
		1/1/07	Doty Bros. Equipment Co. - House Tunnel FEM/OES Project	22,250.65		
		2/1/07	Doty Bros. Equipment Co. - Retention billing for House Tunnel Project	5,697.29		
	Disaster Assistance	3/31/07	House Tunnel- to post previous FEMA/OES Disaster Assistance to Job	-43,350.00		
		3/31/07	House Tunnel- to post previous FEMA/OES Disaster Assistance to Job	-17,313.00		
	Project Engineering	3/13/06	Civiltec Engineering, Inc. - House Tunnel Plans	2,005.00		
		8/7/06	Civiltec Engineering, Inc. - House Tunnel plans	1,334.20		
		9/6/06	Civiltec Engineering, Inc. - House Tunnel FEMA Project Engineering	320.00		
					<b>841.64</b>	
<b>2006 House Tunnel</b>					<b>841.64</b>	<b>61,504.64</b>
2007 New York Main	Mains	8/17/07	Bank of America Business Card - duplicating of plans and specifications	424.20		
		8/17/07	Bank of America Business Card - postage for sending plans and specifications to contractors	153.15		
		9/28/07	SA Associates - Attendance at bid opening and evaluation	1,658.00		
		11/1/07	Stephen Doreck Equipment Renta - Billing #1	54,329.40		
		12/19/07	Stephen Doreck Equipment Renta - Billing #2 New York Drive water main	42,354.00		
		12/26/07	SA Associates - New York Drive construction support services	9,230.00		
	Project Engineering	7/20/07	SA Associates - Design of New York Drive Water Main	9,500.00		
	Office Supplies	9/13/07	Bank of America Business Card - office supplies-K-3	112.70		
	Postage/Delivery	9/13/07	Bank of America Business Card - postage- k-3	54.88		
		11/13/07	Bank of America Business Card - postage new york drive project	119.62		
					<b>117,935.95</b>	
<b>2007 New York Main</b>					<b>117,935.95</b>	<b>150,000.00</b>
2007 Office	Hidden Valley Office	5/19/06	D&G Roofing - Office Roof	5,880.00		
	Outside Services	4/10/07	Barbara Simon - consultation	150.00		
		5/8/07	Barbara Simon - Office renovation consultation	450.00		
					<b>6,480.00</b>	
<b>2007 Office</b>					<b>6,480.00</b>	<b>20,000.00</b>



**Kinneloa Irrigation District**  
**CAPITAL PROJECTS**  
**For the Period From Jan 1, 2006 to Dec 31, 2007**

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Job ID	GL Acct Description	Trx Date	Trans Description	Amount	Totals	Est Expenses
<b>Report</b>					<u><u>306,156.14</u></u>	<u><u>604,996.11</u></u>

**Kinneloa Irrigation District**  
**FACILITY MAINTENANCE AND REPAIR**  
**For the Period From Jan 1, 2007 to Dec 31, 2007**

Filter Criteria includes: 1) IDs from to ; 2) Types from Facility to Facility. Report order is by ID. Report is printed with Accounts having Zero Amounts and including Balance Forward.

Job ID	GL Acct Description	Trx Date	Trans Description	Amount	Totals
Delores Tunnel					
<b>Delores Tunnel</b>					
Eucalyptus Reservoir	Maintenance Contract	2/5/07	Aqua Video Engineering - Clean and inspect Eucalyptus Reservoir	2,725.00	
	Outside Services	10/26/07	A&B Electric - Install SCE Radio TOU switch	1,395.60	
					<b>4,120.60</b>
<b>Eucalyptus Reservoir</b>					<b>4,120.60</b>
Eucalyptus Tunnel	Trans. & Dist. Plant M	4/20/07	Measurement Control Systems, I - Meter for Eucalytus Tunnel	405.24	
					<b>405.24</b>
<b>Eucalyptus Tunnel</b>					<b>405.24</b>
Glen Reservoir	Outside Services	7/17/07	Business Card - Roto Rooter- unlog area and long tunnel drain pipe to glen wash	462.50	
		12/4/07	Bank of America Business Card - roto roter at Glen	185.00	
					<b>647.50</b>
<b>Glen Reservoir</b>					<b>647.50</b>
Hidden Valley Office					
<b>Hidden Valley Office</b>					
High/Low Pressure					
<b>High/Low Pressure</b>					
Holly Reservoir	Equipment Maintenanc	10/5/07	Byrd Industrial Electronics - solve holly and vosburg radio problems	1,074.00	
					<b>1,074.00</b>
<b>Holly Reservoir</b>					<b>1,074.00</b>
House Tunnel	Water Tunnels	1/5/07	Byrd Industrial Electronics - House Tunnel Meter SCADA upgrade	899.68	

**Kinneloa Irrigation District**  
**FACILITY MAINTENANCE AND REPAIR**  
**For the Period From Jan 1, 2007 to Dec 31, 2007**

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Job ID	GL Acct Description	Trx Date	Trans Description	Amount	Totals
			SCADA upgrade		
					<b>899.68</b>
<b>House Tunnel</b>					<b>899.68</b>
K-3 Well	Maintenance Supplies	1/11/07	McMaster Carr - supplies for eyewash install at K-3	436.23	
		1/11/07	Ferguson Enterprises, Inc. - fitting for eyewash install at K03	38.81	
		6/23/07	Stanley Security Solutions, In - locks	21.52	
		6/23/07	Stanley Security Solutions, In - k-3 door handle	96.82	
		8/17/07	Bank of America Business Card - maintenance supplies	437.98	
		11/14/07	Consolidated Electrical Distri - replacement circuit breaker for K-3	1,484.11	
	Water Treatment/Anal	1/12/07	Matt Chlor Inc. - Replacement Cl2 tubing for K-3	111.61	
		3/14/07	McMaster Carr - misc fitting for K-3 chlorinator	72.81	
	Maintenance Contract	12/1/07	A&B Electric - K-3 Well SCE Power disconnect switch device	1,450.74	
					<b>4,150.63</b>
<b>K-3 Well</b>					<b>4,150.63</b>
Long Tunnel					
<b>Long Tunnel</b>					
Sage Tank	Maintenance Supplies	3/13/07	Western Water Works - Air release valve for sage	143.32	
	Maintenance Contract	12/1/07	A&B Electric - Sage SCE power disconnect and indicator	863.68	
					<b>1,007.00</b>
<b>Sage Tank</b>					<b>1,007.00</b>
Tent Tunnel					
<b>Tent Tunnel</b>					
Vosburg Reservoir	Equipment Maintenanc	2/16/07	Byrd Industrial Electronics - SCADA radio and SCADAPack repair	800.00	
					<b>800.00</b>

**Kinneloa Irrigation District**  
**FACILITY MAINTENANCE AND REPAIR**  
**For the Period From Jan 1, 2007 to Dec 31, 2007**

Filter Criteria includes: 1) IDs from to ; 2) Types from Facility to Facility. Report order is by ID. Report is printed with Accounts having Zero Amounts and including Balance Forward.

Job ID	GL Acct Description	Trx Date	Trans Description	Amount	Totals
<b>Vosburg Reservoir</b>					<b>800.00</b>
West Tank					_____
<b>West Tank</b>					<b>_____</b>
Wilcox Reservoir	Maintenance Contract	2/5/07	Aqua Video Engineering - Clean and Inspect Wilcox Reservoir	2,725.00	
		12/1/07	A&B Electric - Controls for Wilcox Power SCE Disconnect	1,444.49	
					<b>4,169.49</b>
<b>Wilcox Reservoir</b>					<b>4,169.49</b>
Wilcox Well	SCADA	1/26/07	Byrd Industrial Electronics - Wilcox Well SCADA Upgrade	2,288.88	
	Maintenance Supplies	3/8/07	McMaster Carr - Vinyl Tarp for Wilcox Well oil drum	151.77	
	Water Treatment/Anal	2/22/07	Matt Chlor Inc. - Chlorine Analyzer repair-membrane caps	356.69	
					<b>2,797.34</b>
<b>Wilcox Well</b>					<b>2,797.34</b>
<b>Report</b>					<b>20,071.48</b>

**Kinneloa Irrigation District**  
**Check Register**  
For the Period From December 1, 2007 to December 31, 2007

<b>Date</b>	<b>Check #</b>	<b>Payee</b>	<b>Amount</b>	<b>Description</b>
EFT047	12/17/07	Arco Gaspro Plus	522.41	truck gas
EFT048	12/17/07	AT&T	72.03	phone
EFT049	12/17/07	AT&T	99.99	phone
EFT050	12/17/07	AT&T	118.69	phone
EFT051	12/17/07	AT&T	46.16	phone
EFT052	12/17/07	AT&T	66.91	Telemetry
EFT053	12/17/07	Calif. Public Employees	1,970.36	PERS
5254	12/18/07	ACWA Services Corp.	4,668.96	health insurance
5255	12/18/07	Alert Communications	78.00	answering service
5256	12/18/07	Ameripride Uniform Ser	116.06	shop rags (2 months)
5257	12/18/07	Athens Services	115.51	trash removal
5259	12/18/07	Consolidated Electrical	677.33	relays and fuses for pump motors
5260	12/18/07	Charter Communication	59.99	Internet service
5261	12/18/07	Clinical Laboratory, Sar	261.00	water analysis
5262	12/18/07	General Petroleum Corp	508.49	pump lubricating oil
5263	12/18/07	Lagerlof,Senecal,Bradle	1,125.00	Sage/West property matters
5264	12/18/07	McMaster Carr	627.88	maintenance supplies
5265	12/18/07	Monrovia Mailing Comj	299.18	statements and postage
5266	12/18/07	MWH Laboratories	132.00	water analysis
5267	12/18/07	Orchard Supply Hardwa	86.85	maintenance supplies
5268	12/18/07	Postmaster	104.00	postage
5269	12/18/07	Underground Service Al	4.00	dig alerts
5270	12/18/07	Utility Service Co., Inc.	5,891.26	tank maintenance agreement
5271	12/18/07	Western Water Works	224.73	maintenance supplies
5272	12/18/07	ACWA Services Corp.	4,868.75	health insurance
EFT054	12/18/07	Christopher A. Burt	1,782.53	payroll
EFT055	12/18/07	Shirley L. Burt	1,260.58	payroll
62777472	12/18/07	Brian Fry	1,328.35	payroll
62777473	12/18/07	Felix Galindo	474.45	payroll
EFT056	12/18/07	Melvin L. Matthews	2,817.83	payroll
62777474	12/18/07	Chris Mellinger	458.44	payroll
EFT057	12/18/07	ADP	85.17	payroll processing
EFT058	12/18/07	Christopher A. Burt	125.00	payroll
EFT059	12/18/07	ADP	3,386.62	payroll taxes
5275	12/18/07	Mike Owens	98.67	customer refund
5274	12/18/07	Richard K. Rosskopf	128.86	customer refund
5276	12/19/07	A&B Electric	3,758.91	SCE power disconnect at two sites
5277	12/19/07	Bank of America Busine	1,158.62	office supplies, antivirus renewal, postage
EFT004	12/24/07	Earthlink Network	4.95	Internet service
5278	12/27/07	Stephen Doreck Equipm	42,354.00	New York Drive pipeline

5279	12/27/07	Mike Gibson Service Ce	964.46	smog test, maintenance and repairs on three vehicles
5280	12/27/07	USAMobility	125.62	pager service
5281	12/27/07	Verizon Wireless	130.30	mobile phones
EFT060	12/31/07	Richard L. Barkhurst	92.35	payroll
EFT061	12/31/07	Christopher A. Burt	2,565.94	payroll
EFT065	12/31/07	Shirley L. Burt	1,366.39	payroll
62818343	12/31/07	Brian Fry	1,527.04	payroll
62818344	12/31/07	Felix Galindo	480.70	payroll
EFT063	12/31/07	Francis J. Griffith	92.35	payroll
EFT062	12/31/07	Gerrie G. Kilburn	92.35	payroll
EFT067	12/31/07	Melvin L. Matthews	2,822.66	payroll
62818345	12/31/07	Chris Mellinger	327.46	payroll
EFT066	12/31/07	Maurice Pickard	92.35	payroll
EFT064	12/31/07	Steve Sorell	57.35	payroll
EFT068	12/31/07	ADP	95.67	payroll processing
EFT069	12/31/07	Christopher A. Burt	125.00	payroll
EFT070	12/31/07	ADP	<u>4,119.49</u>	payroll taxes
Total			<u><u>97,046.00</u></u>	

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**Kinneloa Irrigation District 2007 Financial Summary (Actual and Forecasted)**

Account	Account Description	2007 Budget	January Actual	February Actual	March Actual	April Actual	May Actual	June Actual	July Actual	August Actual	September Actual	October Actual	November Actual	December Actual	2007 FYE Actual	Deviation from Budget
4000	Water Sales	990,732	75,010	58,268	74,620	78,943	96,583	100,849	144,880	106,087	124,063	99,817	88,505	65,733	1,113,356	122,624 12%
4010	Leased Water Sales	0	0	0	0	0	0	0	2,325	0	0	0	0	0	2,325	2,325 0%
4015	Wholesale Water Sales-Pasadena	113,643	25,653	28,265	26,367	0	0	0	0	0	0	0	0	0	80,285	-33,358 0%
4020	Invoice Sales	2,400	2,163	714	380	7,076	0	0	2,683	700	0	105	0	0	13,821	11,421 476%
4030	Interest-General Fund	50	8	28	7	4	3	3	6	5	5	5	4	1	80	30 61%
4035	Interest-LAIF	10,000	7,076	0	0	6,141	0	0	6,165	0	0	7,803	0	0	27,185	17,185 172%
4037	Interest-Bank of America	25	2	2	2	2	3	4	3	1	1	1	1	1	22	-3 -11%
4050	Capacity Charge	3,000	0	0	0	0	0	0	0	0	0	3,000	0	0	3,000	0 0%
4060	Disaster Assistance	0	0	0	9,940	38,930	0	89,785	0	47,227	3,313	0	0	0	189,195	189,195 0%
	<b>Total Income</b>	<b>1,119,850</b>	<b>109,912</b>	<b>87,276</b>	<b>111,315</b>	<b>131,096</b>	<b>96,589</b>	<b>190,641</b>	<b>156,062</b>	<b>154,020</b>	<b>127,382</b>	<b>110,731</b>	<b>88,510</b>	<b>65,735</b>	<b>1,429,269</b>	<b>309,419 28%</b>
<b>Expenditures</b>																
5005	Power	110,000	10,391	9,228	9,715	8,279	7,277	8,265	10,197	9,882	10,875	7,982	6,428	8,271	106,790	-3,210 -3%
5010	Maintenance Supplies	20,000	939	831	904	434	811	1,396	1,021	590	1,229	2,718	3,850	2,658	17,383	-2,617 -13%
5012	Safety Equipment	2,000	0	117	0	587	0	0	0	0	0	0	0	0	704	-1,296 -65%
5015	Maintenance Labor	165,375	14,008	12,927	13,503	14,003	13,951	12,950	13,563	12,358	13,210	12,957	13,091	12,556	159,077	-6,298 -4%
5020	Stand-by	11,000	930	870	930	900	930	900	930	510	690	540	690	600	9,420	-1,580 -14%
5022	Training/Certification	2,400	0	160	150	263	265	250	0	0	311	87	0	49	1,535	-865 -36%
5025	Water Treatment/Analysis	20,000	1,862	1,986	652	2,873	502	1,165	391	1,320	3,842	598	1,046	512	16,750	-3,250 -16%
5030	Maintenance Contractors	48,000	0	5,450	6,562	206	5,255	18,546	-12,323	1,124	3,525	3,230	5,736	12,559	49,869	1,869 4%
5034	Equipment Maintenance	2,000	0	800	0	0	0	926	0	465	834	1,074	0	179	4,277	2,277 114%
5035	Vehicle Maintenance	5,500	466	240	136	393	930	2,671	984	0	0	70	0	811	6,701	1,201 22%
5036	Fuel - All Equipment	8,500	533	763	437	290	628	818	632	614	1,815	616	605	522	8,273	-227 -3%
5040	Equipment Rental	500	0	0	0	0	0	0	0	0	0	0	0	0	0	-500 -100%
5045	Insurance-Workers Comp.	12,000	0	3,790	3,903	0	0	0	3,991	0	0	2,823	0	0	14,507	2,507 21%
5046	Insurance-Liability	15,000	1,105	1,105	1,105	1,105	1,105	1,105	1,229	1,229	1,229	7,255	1,229	-2,297	16,503	1,503 10%
5048	Insurance-Property	2,500	186	186	186	186	186	186	186	186	186	186	186	186	2,235	-265 -11%
5049	Insurance-Medical	43,000	3,261	2,742	2,912	3,391	2,438	2,915	2,921	2,918	3,398	2,437	-1,271	7,014	35,076	-7,924 -18%
6000	Project Engineering	6,000	0	680	340	1,408	0	0	10,010	-9,500	0	0	0	0	2,938	-3,063 -51%
6005	Watermaster	7,500	0	0	51	661	661	661	661	661	661	661	661	661	5,999	-1,501 -20%
6010	Telemetry	850	68	68	0	135	67	67	67	67	67	67	67	67	806	-44 -5%
6015	Administrative Salary	92,610	6,945	6,945	6,945	7,362	7,362	7,362	7,362	7,362	7,362	7,362	7,362	7,362	87,092	-5,518 -6%
6017	Administrative Travel	2,500	663	113	328	642	191	0	356	328	287	698	485	89	4,181	1,681 67%
6018	Administrative PERS	6,400	449	449	477	506	0	534	506	506	0	506	506	506	4,945	-1,455 -23%
6020	BofD Compensation	7,000	500	500	700	500	500	400	500	500	900	300	400	500	6,200	-800 -11%
6021	Administrative Exp.	2,500	0	0	0	0	545	805	0	465	0	668	351	32	2,865	365 15%
6024	Customer/Public Info. Prog.	4,000	0	163	0	0	15	1,300	250	0	0	0	0	0	1,728	-2,272 -57%
6025	PERS - KID	11,500	854	786	829	719	0	872	829	840	0	862	862	840	8,294	-3,206 -28%
6030	Social Security - KID	24,800	2,017	1,891	1,981	2,016	2,040	1,932	1,951	1,943	1,948	1,924	1,940	1,882	23,464	-1,336 -5%
6035	Office Supplies	9,000	342	287	705	648	1,244	0	217	356	261	118	138	292	4,609	-4,391 -49%
6036	Postage/Delivery	5,500	235	293	237	105	279	305	337	257	338	256	320	335	3,299	-2,201 -40%
6040	Professional Dues	7,000	383	427	356	356	856	661	356	356	456	356	2,117	356	7,036	36 1%
6045	Legal	10,000	0	116	0	961	0	63	0	500	0	1,995	440	1,125	5,200	-4,800 -48%
6050	Telephone	5,000	415	382	91	665	414	416	421	406	425	428	369	493	4,924	-76 -2%
6051	Cellular Telephone	2,500	214	118	136	268	135	133	133	140	130	437	139	130	2,113	-387 -15%

**Kinneloa Irrigation District 2007 Financial Summary (Actual and Forecasted)**

Account	Account Description	2007 Budget	January Actual	February Actual	March Actual	April Actual	May Actual	June Actual	July Actual	August Actual	September Actual	October Actual	November Actual	December Actual	2007 FYE Actual	Budget Amount	
6052	Pagers	1,800	126	126	126	126	128	126	126	142	126	128	126	126	1,529	-271	-15%
6053	Internet Service	1,000	65	65	65	70	65	65	70	70	70	70	70	70	814	-186	-19%
6059	Computer/Software Maintenance	8,000	437	879	732	826	185	0	0	-198	244	934	1,213	547	5,799	-2,201	-28%
6061	Office Equipment Maintenance	1,000	0	0	0	1,184	0	0	0	0	0	0	0	0	1,184	184	18%
6065	Accounting	7,000	0	4,800	0	0	0	0	0	0	0	0	0	0	4,800	-2,200	-31%
6070	Office Labor	46,200	3,987	3,475	3,816	3,582	3,923	3,646	3,816	4,003	3,416	3,987	3,752	3,582	44,984	-1,216	-3%
6075	Outside Services	16,000	747	768	687	4,099	4,542	650	1,243	603	671	1,948	393	627	16,979	979	6%
6081	Permits/Fees	2,500	0	225	0	0	0	359	0	0	0	0	0	0	584	-1,916	-77%
6120	Bank Service Charges	1,200	0	0	109	65	171	378	-25	43	91	22	34	257	1,145	-55	-5%
	<b>Total Expenses</b>	<b>757,135</b>	<b>52,128</b>	<b>64,753</b>	<b>59,806</b>	<b>59,814</b>	<b>57,601</b>	<b>72,827</b>	<b>52,910</b>	<b>41,045</b>	<b>58,595</b>	<b>66,298</b>	<b>53,333</b>	<b>63,500</b>	<b>702,609</b>	<b>-54,526</b>	<b>-7%</b>
	<b>NET REVENUES</b>	<b>362,715</b>	<b>57,783</b>	<b>22,523</b>	<b>51,509</b>	<b>71,282</b>	<b>38,988</b>	<b>117,814</b>	<b>103,152</b>	<b>112,975</b>	<b>68,787</b>	<b>44,433</b>	<b>35,177</b>	<b>2,236</b>	<b>726,660</b>	<b>363,945</b>	<b>100%</b>

**Other Expenditures and Adjustments**

1200	Inventory	5,000	387	0	0	0	791	2,554	762	0	-45	-1	0	0	4,448	-552	-11%
1504	Mains	75,000	0	0	0	0	0	0	0	10,077	1,658	0	54,329	51,584	117,649	42,649	57%
1505	Tunnels	0	102,578	5,697	57,268	0	0	0	0	-42,418	0	0	0	0	123,126	123,126	0%
1511	Water Treatment Plant	7,500	0	0	5,038	438	0	0	0	0	9,378	0	0	0	14,855	7,355	98%
1512	Meter Replacement	2,400	0	0	405	925	3,411	0	0	0	4,379	0	0	0	9,120	6,720	280%
1513	Electrical/Electronic Equipment	10,000	27,977	0	0	0	0	0	0	0	0	0	0	0	27,977	17,977	180%
1514	Computer/Office Equipment	3,000	2,763	0	212	0	0	0	0	0	0	0	0	0	2,975	-25	-1%
1515	Truck Equipment	45,000	0	0	0	0	0	0	0	0	0	0	0	0	0	-45,000	-100%
1517	Office	10,000	0	0	0	0	0	0	0	0	0	0	0	0	0	-10,000	-100%
1527	SCADA	7,500	5,134	0	0	0	0	1,675	0	0	0	0	0	0	6,809	-691	-9%
1528	Tanks and Reservoirs	125,000	19,454	5,891	5,891	18,636	10,596	10,644	11,854	5,891	5,891	5,891	5,891	10,417	116,949	-8,051	-6%
	<b>Total Other Expenditures</b>	<b>290,400</b>	<b>158,295</b>	<b>11,589</b>	<b>68,814</b>	<b>20,000</b>	<b>14,799</b>	<b>14,872</b>	<b>12,616</b>	<b>-26,449</b>	<b>21,260</b>	<b>5,890</b>	<b>60,221</b>	<b>62,001</b>	<b>423,907</b>	<b>133,507</b>	<b>46%</b>

**NET CASH FLOW**

	<b>NET CASH FLOW</b>	<b>72,315</b>	<b>-100,511</b>	<b>10,934</b>	<b>-17,305</b>	<b>51,282</b>	<b>24,189</b>	<b>102,942</b>	<b>90,536</b>	<b>139,425</b>	<b>47,526</b>	<b>38,544</b>	<b>-25,044</b>	<b>-59,765</b>	<b>302,752</b>	<b>230,437</b>	<b>319%</b>
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