COMORE LOMA WATER SYSTEM FACILITY PLANNING STUDY

Prepared for:
Comore Loma Water Corporation
P.O. Box 1863
Idaho Falls, Idaho 83403

PROFESSIONAL ENGINEER
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STATE OF IDAHO
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7-22-14

FINAL

July 2014

Prepared by:

Schiess & Associates
ENGINEERING • PLANNING • LAND SURVEYING

Project No. 12076

COMORE LOMA WATER SYSTEM

Preliminary Engineering Report

According to USDA Bulletin 1780-2

Submitted To:

Comore Loma Water Corporation
P.O. Box 1863
Idaho Falls, ID 83403

FINAL REPORT

Schiess & Associates
ENGINEERING·PLANNING·LAND SURVEYING

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EXECUTIVE SUMMARY

Comore Loma Water Corporation began serving water to customers around 1972 with a well and storage tank. Since then this community has grown into a water system serving 320 homes over three pressure zones using water from five wells, all of which are positioned in the lowest pressure zone in the system. There remains approximately 214 vacant lots scattered throughout the community that will eventually be developed and served water.

In the summer of 2012, the system experienced several unfortunate events that compromised the overall production capacity of system wells. The results of these events were chronic lack of water supply and empty storage tanks. This resulted in low pressure for some homes including the inability to take showers and the inability to water lawns and keep lawns green. Frustration of system patrons resulted in calls for change. These events became impetus for the water system board to improve management and oversight and seek professional help to diagnose problems, explore solutions to improve the reliability of water delivery and ensure that there is always adequate pressure for daily needs, including irrigation.

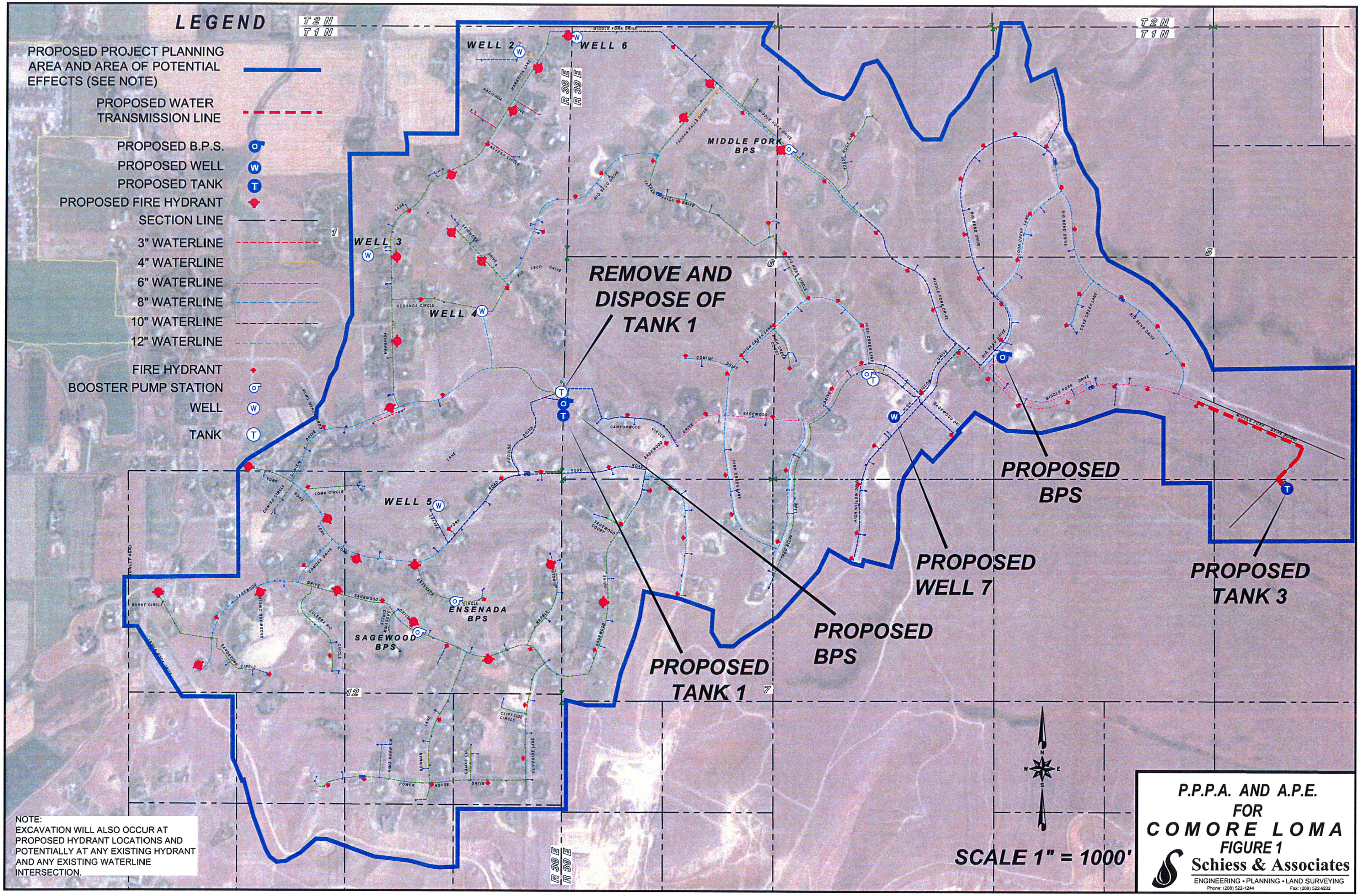
Management improvements included formalizing operations by initiated independent financial audits, instituting strict irrigation schedules and increasing water usage fees to fund needed improvements and cover maintenance costs. The corporation board also took a very proactive approach in working with the engineer to develop solutions to working with the originating developer of the community who holds ownership of 80 approved but unsold lots. These efforts resulted in preparation of water system facility planning study endorsed by the water corporation board and DEQ that recommends many improvements to the water system.

These improvements are needed to bring the water system up to Bonneville County fire flow standards and hydrant spacing standards, increase redundancy of well sources so that the system can function well even if a well is out of service, maintain needed fire flow storage in water storage tanks, ensure fire flow requirements are met at ever platted lot, provide portable emergency power to ensure that water will always be available to every lot during an extended loss of power, including the lots in the upper elevations of the system and provide needed pumping capacity and redundancy from the lower pressure zone to the upper pressure zones. These improvements will bring the water system into compliance with current Idaho Rules for Public Drinking Water Systems. The needed infrastructure to accomplish this plan is given in the following table:

Table 19 – Alternative 13 Estimate of Probable Cost (Without Water Meters)

Item No.	Item	Estimated Cost
1	Replace Broken Distribution System Valves and add 24 Fire Hydrants (see Table 9)	$163,400
2	Add Flow Meters to Existing Pump Stations (See Subsection 5.5.2)	$42,000
3	Drill New Well #7 Capable of Producing 1,000 gpm	$225,000
4	Well House and Vertical Turbine Pump for New Well #7 (See Appendix F)	$373,000
5	Booster Station at Tank 1 and Three Phase Power to Site Capable of 1,725 gpm without Generator (See Appendix F)	$492,200
6	New 422,000 Gallon Storage Tank for Zone 1 (See Appendix F)	$395,400
7	Tank 3 Bolted Steel Tank Holding 533,000 Gallons (See Appendix F)	$470,200
8	Finish Big Bend Booster Pump Station with (3) 60 Hp Pumps	$314,000
9	Install Transmission Pipe from Zone 4 to Tank 3 (See Appendix F)	$124,000
10	Portable Trailer-mount 300 KW Generator and manual switch gear primarily for one Well, Tank 1 BPS and Big Bend BPS	$150,000
11	Water Meters at each Residence (see Table 10)	$0
12	SCADA Improvements for Water Meters in Well Houses and Programming for Flow Data Trend Lines, Pump Operating Hours and Cumulative Reports	$15,000
Total Construction		**$2,764,200**
Administration, Legal and Interest Costs (4% of total above)		**$111,000**
Total Estimated Project Cost		**$2,875,200**

This scope of work was presented to the water system patrons in a public meeting held on January 23, 2014. The water system corporate board developed a Powerpoint presentation and presented it to system patrons. The author of the facility planning study was also present and assisted in answering questions when asked. A vote of the patrons on how to move forward occurred on February 13, 2014. The patrons supported this project with a 123 votes. There were 27 votes for doing nothing and 40 votes for other alternatives. The option to install water meters at every home was presented to patrons as a separate ballot measure. It was voted down with 121 votes against and 50 for. The following map was taken from the EID and shows the project scope of work.


LEGEND
PROPOSED PROJECT PLANNING AREA AND AREA OF POTENTIAL EFFECTS (SEE NOTE)
PROPOSED WATER TRANSMISSION LINE
PROPOSED B.P.S.
PROPOSED WELL
PROPOSED TANK
PROPOSED FIRE HYDRANT
SECTION LINE
3" WATERLINE
4" WATERLINE
6" WATERLINE
8" WATERLINE
10" WATERLINE
12" WATERLINE
FIRE HYDRANT
BOOSTER PUMP STATION
WELL
TANK
T2N
T1N
R 38 E
R 39 E
WELL 2
WELL 6
WELL 3
WELL 4
WELL 5
MIDDLE FORK BPS
ENSENADA BPS
SAGEWOOD BPS
REMOVE AND DISPOSE OF TANK 1
PROPOSED TANK 1
PROPOSED BPS
PROPOSED WELL 7
PROPOSED BPS
PROPOSED TANK 3
1
5
6
7
12
NOTE:
EXCAVATION WILL ALSO OCCUR AT PROPOSED HYDRANT LOCATIONS AND POTENTIALLY AT ANY EXISTING HYDRANT AND ANY EXISTING WATERLINE INTERSECTION.
SCALE 1" = 1000'
P.P.P.A. AND A.P.E. FOR COMORE LOMA
FIGURE 1
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With the plan presented to system patrons and voted on February 13, 2014, the loan needed to make improvements would be paid for by three user classes: lots with homes, private lots without a home and developer owned lots without homes. With this plan those holding lots without a home help pay for the infrastructure that will provide water to their future home and the developer has a mechanism to pay over time the infrastructure he remains responsible for. With this project, system patron's water bills will increase, but not to the extent that one might think. In 2013, the system collected an average of $97/mo. from each user. The estimated monthly costs are broken down as shown in funding plan on the following table:

Table 22 – Alt. 13 w/o Water Meters and Loan Repaid by Homeowners and Lot Owners Including Developer Owned Lots.

Item		**Alt 13 w/o Meters**	
Total estimated project capital cost		$2,875,200	
Contingency 6%		$174,800	
SRF loan forgiveness (estimated)		-$240,000	
SRF loan amount (1.25% for 30 years)		$2,810,000	
User Class	Home	Private Lots	Developer Lots
No. Units[1]	320	120	80
Annual debt service distribution per user class	$51,319	$19,245	$42,338
Estimated O&M cost with new project (including short-lived assets)	$326,190	$0	$0
Estimated annual debt reserve (10% of loan)	$5,132	$1,924	$4,234
Capital reserve for long term asset replacement @ $40/user/yr	$12,800	$0	$0
Total estimated annual costs	$395,441	$21,169	$46,572
Estimated quarterly O&M costs per user class (including short-lived assets)	$255	$0	$0
Estimated Loan payment figured quarterly per user class	$40	$40	$132
Estimated debt reserve figured quarterly per user class (10% of loan)	$4	$4	$13
Capital reserve for long term asset replacement per quarter per EDU	$10	$0	$0
Estimated quarterly rate per user class	**$309**	**$44**	**$146**
Estimated monthly rate per user class	**$103**	**$15**	**$49**

[1]Hydraulic calculations used a total of 534 lots. This analysis uses a total of 520 lots. These numbers were provided to the engineer.

Although these rates are quite high, it is estimated to be only a $6/mo. increase to the existing homeowners. This plan allows the cost of the loan to be spread out to all user classes and requires all users or future users to pay a fair share. Implementation of this plan will allow the water system to operate in accordance with the Idaho Drinking Water Rules and meet current fire flow requirements of rural communities in Bonneville County. With a FY 2014 approved loan, design and construction should be completed by December 2015.

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LIST OF ABBREVIATIONS

Alt.	Alternative
bgs	Below Ground Surface
BPS	Booster Pump Station
CCTV	Closed-circuit Television
cfs	Cubic Feet per Second
DEQ	Department of Environmental Quality
EDU	Equivalent Dwelling Unit
EID	Environmental Information Document
EPA	Environmental Protection Agency
F	Fahrenheit
FONSI	Findings of No Significant Impact
FPS	Facility Planning Study
gpd	Gallons per day
gpm	Gallons per minute
Hp	Horse power
ICDBG	Idaho Community Development Block Grant
IDWR	Idaho Department of Water Resources
IOC	In-Organic Contaminants
kW	Kilowatt
LMI	Low to middle income
mg/L	Milligrams per liter (same as parts per million)
MCL	Maximum Contaminant Level
Mo	Month
O&M	Operations and Maintenance
ppm	Parts per million (same as mg/L)
psi	Pounds per square inch
PRPSV	Pressure Reducing Pressure Sustaining Valves
PRV	Pressure Reducing Valves
PVC	Poly Vinyl Chloride
Rules	Idaho Drinking Water Rules (IDAPA 58.01.08)
SCADA	Supervisory Control And Data Acquisition
SRF	State Revolving Fund
SOC	Soluble Organic Carbon
TDH	Total Dynamic Head
USACE	United States Army Corps of Engineers
USDA-RD	United States Department of Agriculture-Rural Development

VFD	Variable Frequency Drive
VOC	Volatile Organic Compound

1.0 GENERAL

1.1 General

This study describes Comore Loma Water Corporation's existing water system, its present condition, analyzes alternatives and proposes a specific course of action to make improvements. This study is complete with environmental considerations, financial impacts including the rate impact to each patron of proposed improvements. USDA-RD Bulletin 1780-2 is used as a guide to prepare this report. The intention of this report is to provide justification for the construction of new pumping, storage and well infrastructure identified as necessary to fulfill the USDA-RD preliminary engineering report requirement for needed infrastructure. However, prior to finishing this report, the DEQ preliminary 2014 SRF loan list was published. With the Corporation's letter of intent DEQ ranked Comore Loma number 10 statewide. This has made the Corporation consider strongly pursuit of SRF funds. Thus consideration of applying for SRF funds is also included in the study.

The study aims to help the water system fully adapt to current fire flow requirements, hydrant spacing requirements and water source redundancy requirements in the same manner that municipal water systems that have aged several decades have had to do.

1.2 Background

This report, prepared in draft form in September 2012, focused on well supply, water storage and pumping deficiencies and needs with the intent of using the document to satisfy DEQ preliminary engineering report requirements pursuant to helping the water board justify capital improvements. The findings included adding a booster pump station from Zone 1 to Zone 2, adding another well and replacing the Zone 1 storage tank.

Since September, 2012, at the urging from the board's engineer and from board meetings and meetings with water system patrons, the board and Schiess & Associates approached USDA-RD for financial assistance to make capital improvements. USDA-RD responded by inviting Comore Loma Water Corporation to prepare an application for a guaranteed loan. Concurrent with the discussions with USDA-RD, the Corporation Board submitted a letter of intent to DEQ for DEQ SRF funding. It turns out that DEQ ranked Comore Loma #6 and earmarked $1,800,000 in loan funds at 1.25 percent interest on a 30 year loan and $133,966 of loan forgiveness (a grant). As a result of this, the board has changed its course and is pursuing DEQ SRF funding. This document was submitted to DEQ with the intent of completing the DEQ environmental review process to prepare for loan funding from the DEQ SRF program according to Form 5-A for the facility planning study. In seeking loan funds an environmental review must be completed in accordance with DEQ Form 5-B. This report is now updated to help meet all of these requirements for a SRF loan application.

The water system is designated PWS# 7100020 by Idaho DEQ. With 320 connections and an average of 3.2 people per connection, the estimated system population is 1,024 people. Thus Comore Loma water system would be classified by DEQ as a Class I system. Untreated groundwater is exclusively used for water supply.

1.3 Owner Responsibility

The Comore Loma Water Corporation operates as a nonprofit corporation under Idaho law to operate a water system that provides water service to the Comore Loma Subdivision. The water system was constructed by the Comore Loma Subdivision developer where, after completion, ownership was transferred to the Corporation. The Corporation has the responsibility to operate, perform maintenance, make improvements, establish water rates, collect revenue from water users, pay all incurred cost and perform all other duties, as described in the Articles of Incorporation and Bylaws (see Appendix G), required to manage the Corporation. In the pursuit of these responsibilities, the Corporation has successfully replaced aging or broken pipes, valves, pumps, and other structures or components from time to time as required while still meeting Idaho drinking water regulations. Upgrades have also been performed, as listed below, to meet the needs of the water system:

- Replace two submersible well pumps with more efficient and larger capacity pumps
- Reconfigured a submersible well pump to an above ground turbine variable frequency pump to increase reliability and capacity
- Upgrade the SCADA system to improve reliability, increase capabilities, and operator security.

The cost for these repairs and upgrades have been financed by increasing water rates and issuing special assessments such that the Corporation has never been in debt and maintained sufficient funds to meet all obligations. These same financial methods will be used to fund the recommended improvements outlined in this report.

The development now consists of 25 divisions. With each new division, the Water Corporation assumes ownership of the water system infrastructure located within the division boundary. The Articles of Incorportion are continually updated to reflect the entire water system boundary.

2.0 PROJECT PLANNING AREA

2.1 Location

The Comore Loma water system is located southeast of Ammon in Bonneville County in the foothills bordering and east of the Snake River plain in Sections 1 & 12 in Township 1 North, Range 38 East and Sections 5, 6, & 7 in Township 1 North, Range 39 East. This development originated in the early 1970's with Division 1. The latest approved division is Division 25 in 2007. A vicinity map showing the general location of the entire water system relative to Ammon and Idaho Falls is given below as Figure 1.

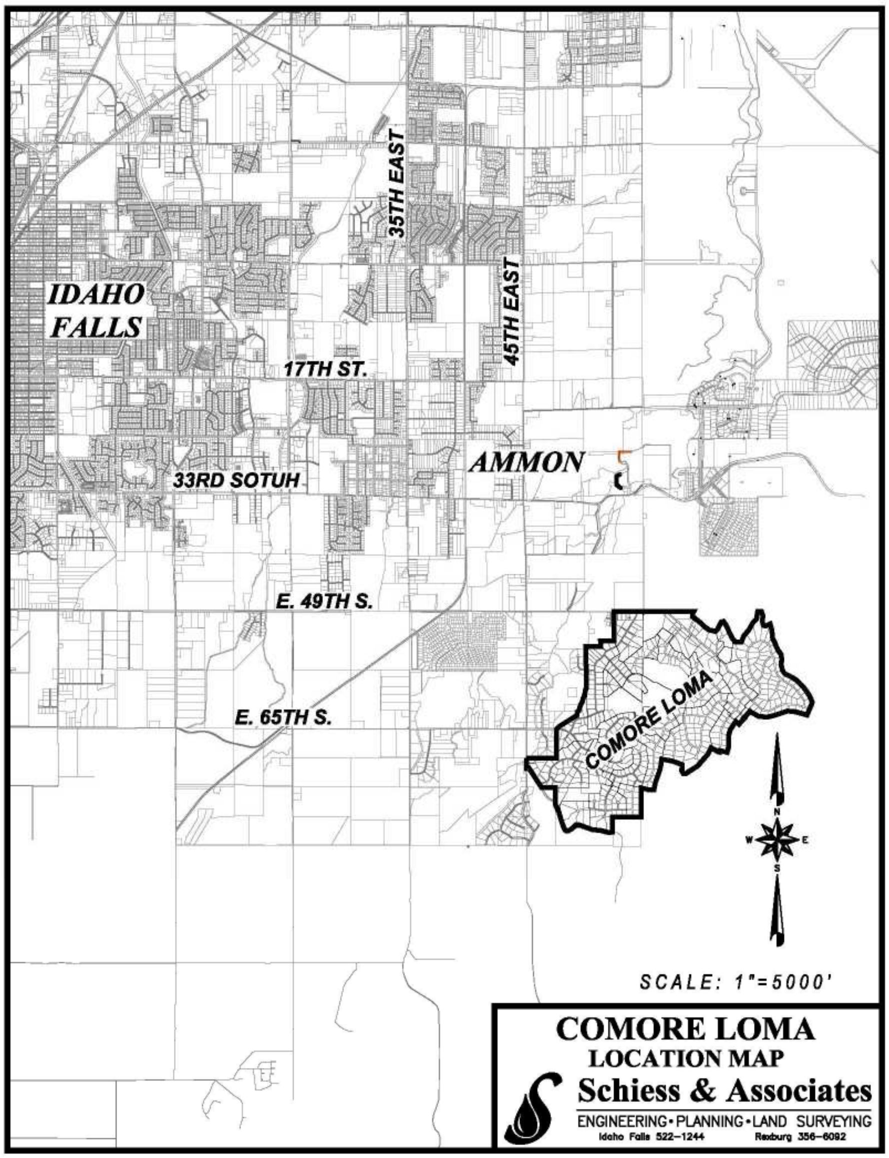


Figure 1 - Vicinity Map

The entire water system currently encompasses approximately four square miles. This rural home subdivision consists of over three hundred large homes on lots of one acre or two acres with a few over five acres. The Water Corporation governs all water supply and delivery actions technically, financially and managerially.

2.2 Environmental Resources Present

This section gives a very broad brush of current environmental conditions in this rural subdivision.

2.2.1 Physiography, Topography, Geology and Soils

The subdivision lies in the foothills east of the Snake River Plain southwest of Idaho Falls and Ammon. These foothills consist of silty, loess fine grain soils that range from shallow to several feet thick overlaying lava rock. Lava rock outcroppings are visible, particularly on the slopes of steep gullies and other natural wash areas. Currently the elevation at the top of the subdivision at the Zone 3/Zone 4 boundary is 5,435 feet. The base of Zone 1 is approximately 4,918 feet measured at Well 2.

2.2.2 Surface and Groundwater Hydrology and Proximity to Sole Source Aquifer

There is no perennial stream that flows through the current subdivision boundaries. However, due to the steep nature and undulating hills and gullies in the development, natural drainages exist and run during spring snowmelt and after heavy rainstorms.

The system water sources are entirely groundwater. Wells in the area are deep and range from 295 feet deep at Well 2 to 520 feet deep at Well 5. A test well for Well 7 drilled near Tank 2 on High Willow Drive was drilled to 700 feet with water found at the bottom of the hole. The DEQ sourcewater assessment document for Comore Loma describes the groundwater zone of influence feeding each well as pie slices approximately one mile long and a half mile wide at the end extending to the east northeast of Comore Loma. The wells are near the boundary of the Snake Plain Aquifer.

2.2.3 Fauna, Flora and Natural Communities

Animal and plant life is typical of foothills east of Idaho Falls. Foothills are covered with sagebrush. Much of the area would be considered rangeland prior to development. Low lying areas and gullies may have brushy woody plants. Wildlife habitat would consist of coyote, fox, rabbit, pheasant, Chukar, grouse doves and birds of prey. Big game would include an occasional presence of deer and elk.

2.2.4 Housing, Industrial and Commercial Development and Land Use

The subdivision is solely for single family homes and is homogeneous in nature. There are no commercial or industrial enterprises. Land use in the past was for range land in the upper elevations and perhaps some farming near the canals on the extreme west side. Much of the development is too steep for farming.

2.2.5 Cultural Resources

No resources are known to exist at this time. The environmental review will be relied upon to discover or document cultural resources.

2.2.6 Utility Use

The development relies upon Rocky Mountain Power exclusively to operate well pumps. Natural gas though Intermountain gas is available at each home.

2.2.7 Floodplain/Wetlands

A cursory review shows no wetlands in the subdivision boundary. A cursory review of FEMA maps show no 100 year floodplain influence. The western edge of the subdivision shows minor risk of flooding from the canals, but only in the 500 year zone. This will be considered in detail in the environmental review.

2.2.8 Precipitation, Temperature and Prevailing Winds

For this subsection, the USDA Soil Survey for Bonneville County was used. It describes the climate of Bonneville County as 22 degrees F average winter temperature, and 66 degrees F average summer temperature with highs as much as 101 degrees F and lows as low as -33 degrees F. Normal precipitation is approximately five inches, with 60 percent falling from April to September. Average seasonal snowfall is 32 inches. Relative humidity is around 40 percent in the afternoons and higher at night with around 70 percent at dawn. The sun shines 80 percent of the time. The prevailing wind is from the southwest. Average wind speed is highest in the spring. Winds normally vary from 0 to up to 60 mph with 20 mph common.

2.2.9 Air Quality & Noise

With the rural nature of the subdivision, air quality would only be affected by spring and summer windstorms that pick up dust from range and farm lands, smoky air typical of summer and fall from nearby and far away range and forest fires. There is little noise concern in this area.

2.2.10 Energy Production and Consumption

The development is only a consumer of energy. Water use in the community is approximately four to five times that of water systems on the valley floor. High water use is due to the irrigation of large yards for aesthetics and protection against the threat of range fires within the development and on its outer edges. The high sprinkler irrigation use on lawns requires high amounts of energy use in the summer to run system pumps.

2.2.11 Socioeconomic Profile

Due to its rural nature on the outskirts of Idaho Falls and Ammon, there are no available specific socioeconomic data available. The subdivision is populated with attractive homes on well landscaped yards.

2.3 Growth Areas and Population Trends

Comore Loma is a rural home subdivision that has grown parallel with the economy. When the economy is up, homes are built. When the economy is down, new homes added to the system slow. A housing boom occurred from 2003-2007. A slow down occurred after the housing market collapsed in December 2007. Few homes have been added since that time.

Currently there are 320 homes connected to the water system. There are no commercial, industry or institutional patron types. The 320 users are spread across three pressure zones. Zone 1 has 165 users; Zone 2 has 131; Zone 3 has 24 and Zone 4 currently has none. No water supply is currently available for 16 Zone 4 lots.

Historically, the average growth of the system has averaged 8 homes per year (320 homes/40 years). Local developers make water infrastructure available as needed to support new lots and homes. There are currently 41 lots without homes in Zone 1, 92 in Zone 2, 65 in Zone 3 and 16 in Zone 4.

New homes added to the system over the next 20 years will be built on existing available lots and on new lots yet to be developed. The latest division added to the system was Division 25 in 2007.

This report also outlines a rationale to reduce energy costs in providing water to Zone 3 users in Division 25. The Division 25 water system improvements were approved under DEQ #07-28-10 approval letter dated August 23, 2007.

3.0 EXISTING FACILITIES

3.1 Location Map

Figure 2 (see next page) illustrates the outer boundary of the water system including the line sizes, locations of hydrants, wells, storage tanks, and booster pump stations. The major components are labeled. These labels are used throughout this report. For perspective, a schematic of the system labeled Figure 3 is also provided and describes the details of each source and tank in the system.

The system consists of four pressure zones. All wells are located in Zone 1. There are two booster pump stations that pump water from Zone 1 to Zone 2. Zone 1 and Zone 2 each have a storage tank which sets pressure for the zone during static or near static conditions. Each of these elements are shown on the Figure 3 schematic of the existing system.

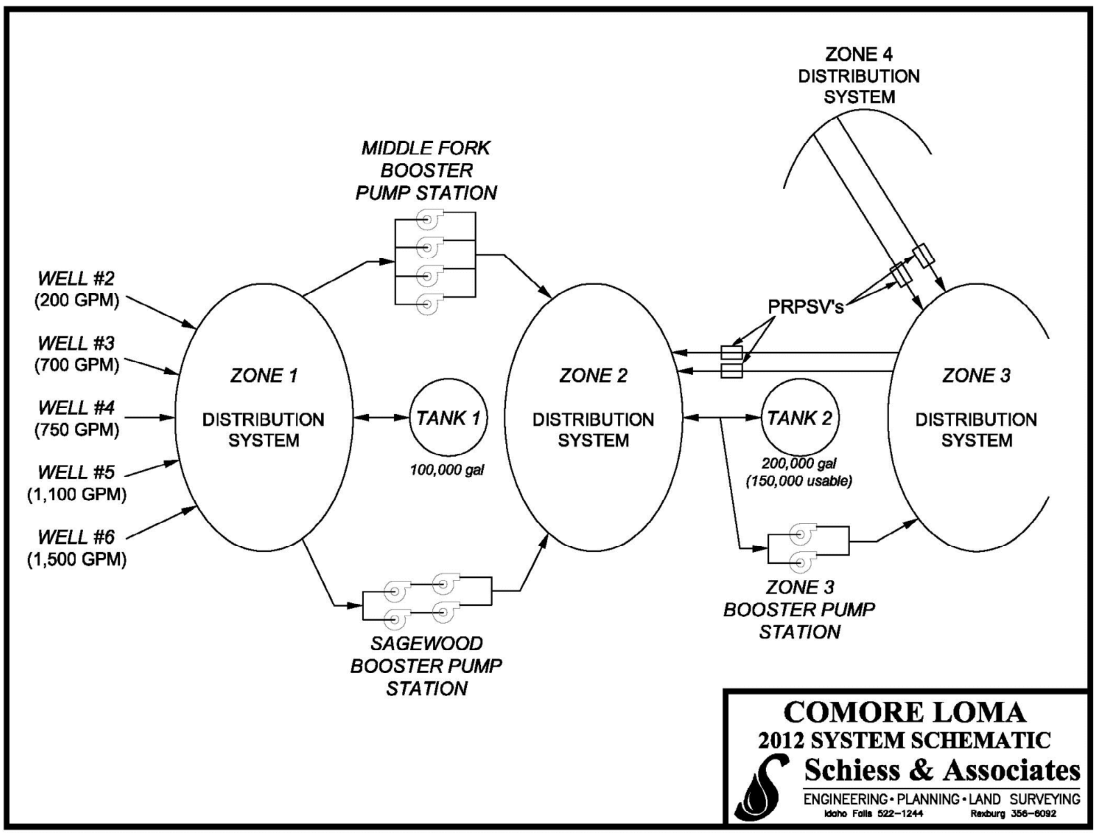
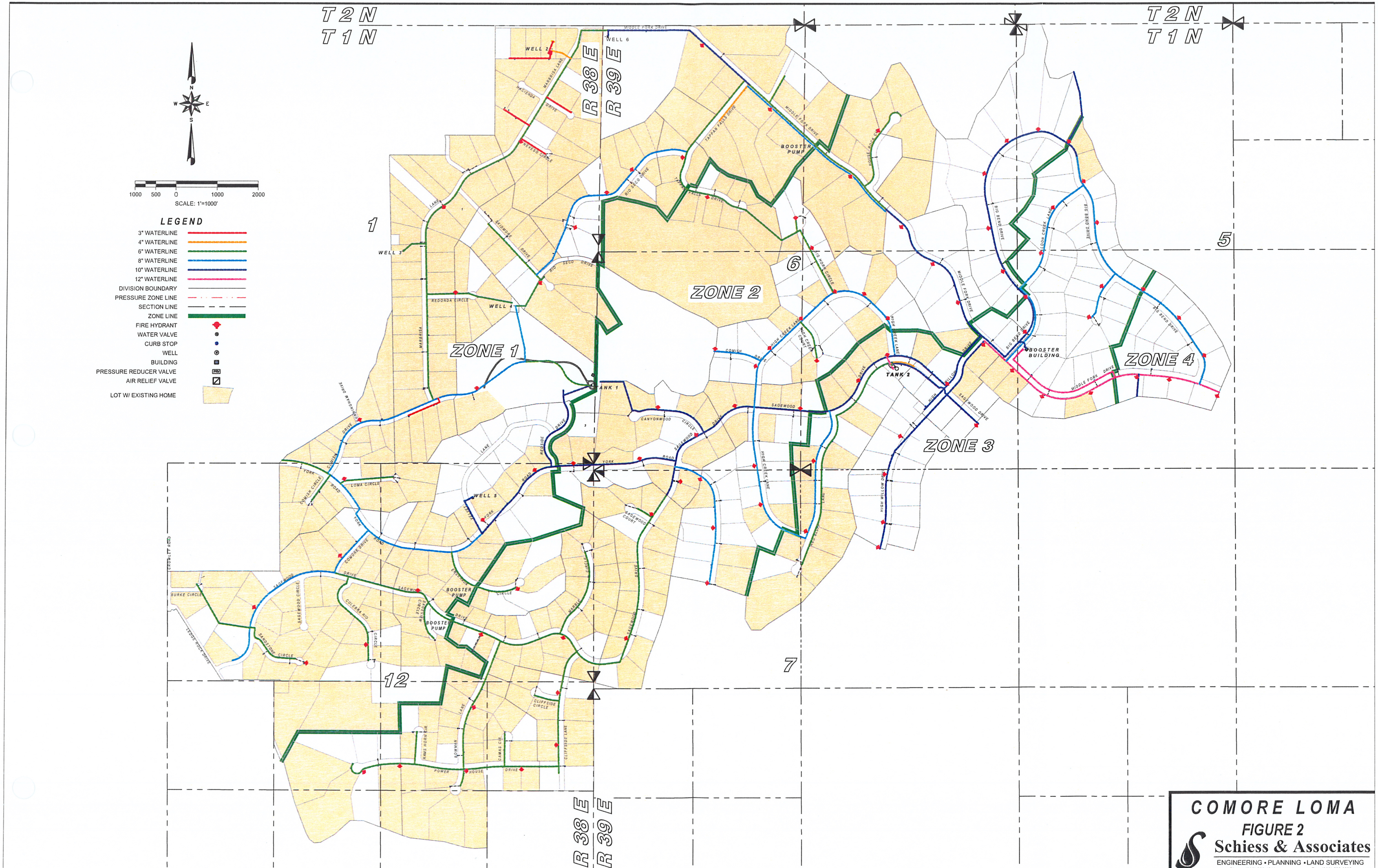


Figure 3 - Existing System Schematic



COMORE LOMA

FIGURE 2

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3.2 History of Water System

The system has grown over time as shown in Table 1. The well logs document when each well was added to the system.

Table 1 – Well Data

Well #	Drill Year	Production (gpm)	Pump Type/Size	# Homes
Well #1	1973	small	Unknown	---
Well #2	1973	200	Sub./40 Hp	15
Well #3	1976	700	Sub./125 Hp	72
Well #4	1991	750	Sub./125 Hp	124
Well #5	1997	1,100	Vert. Tur./300 Hp	207
Well #6	2006	1,500	Vert. Tur./300 Hp	320

This table illustrates that as the population of the system has grown, wells have been added to meet the demands of the system.

The booster pump stations and storage tanks were added when they became necessary to supply consumer needs. Tank 1 was constructed in 1972. Tank 2 was constructed in 2004. The booster pump stations have been reconfigured and pumping capacity enlarged over time to move water from Zone 1 and Zone 2. Middle Fork Booster Pump Station (BPS) now has four 30 Hp centrifugal pumps to pump water to Zone 2. Middle Fork BPS is newer than the Sagewood BPS. Sagewood pumps were once renovated when demands of more head and flow were required to fill Tank 2.

Waterlines were installed with the improvements made for each approved division. With the construction of Well 6, a second waterline was installed above and below the Middle Fork (BPS) to operate in parallel with another waterline to move water from Zone 1 to Zone 2 with less velocity and head loss.

Division 25, the last approved division, was approved and construction began in 2007. Few homes have been added in the last five years.

3.3 Existing Conditions

3.3.1 Current Operating Parameters

The system currently serves 320 homes across three pressure zones. An overall system map of existing features was provided as Figure 2. This map shows pressure zone boundaries, water main lines and sizes, fire hydrants, well locations, booster pump station locations, pressure reducing stations and tank locations.

A breakdown of the homes served in each zone and current operating conditions are given in Table 2.

Table 2 - Number of Homes and Operating Conditions

	Overall	Zone 1	Zone 2	Zone 3	Zone 4
No. of homes Being Served	320	165	131	24	0
Average Daily Flow, gpm	901	465	369	68	0
Maximum Day Flow, gpm	3,846	1,983	1,574	288	0
Max Day/Avg Day Ratio	4.3	4.3	4.3	4.3	#DIV/0!
Peak Hour Flow, gpm	4,650	2,398	1,904	349	0
Peak Hour/Avg Day Ratio	5.2	5.2	5.2	5.2	#DIV/0!
Averge Winter Day, gpm	67	35	28	5	0
Peak Hour/Maximum Day Ratio	1.2	1.2	1.2	1.2	#DIV/0!
Average Daily Flow/Connection, gpm	2.8				
Peak Hour Flow/Connection, gpm	14.5				

Since each well does not have a flow meter and since flow meter records for wells with flow meters were not available, we developed an alternate way to obtain water use data for the system. We used SCADA system run-time data.

The system is automatically operated by a SCADA system that starts and stops pumps automatically and records many useful trend lines. Access to the SCADA historical pump run trend lines were made accessible to us for each well pump. We logged the start time and stop times of each pump for every day of the month for the months of January and July of 2011. Climatology data was also considered in the choice of July. The process to obtain the run times of each well pump each day could best be described as extraction. Obtaining run times of each pump that periodically started and stopped throughout each day proved to be highly laborious. Start and stop times were recorded for each run segment, subtracted, then run time summed for each day for each pump. Then, understanding how each pump was driven, (constant speed operation or by VFD) and by understanding the amount of flow possible using each pump curve, the production was estimated, multiplied by the run time, then summed to get daily volumes. Operators also produced input of typical flow for each pump based on experience and first-hand witnessing of pump operations. By summing each day for the month we calculated the monthly water use for January and July. The other ten months were estimated using extrapolation of the months of January and July and our experience with water systems in Eastern Idaho that heavily rely on sprinkler irrigation of lawns and landscaping to keep yards green and healthy. The results of this work are given on Figure 4.

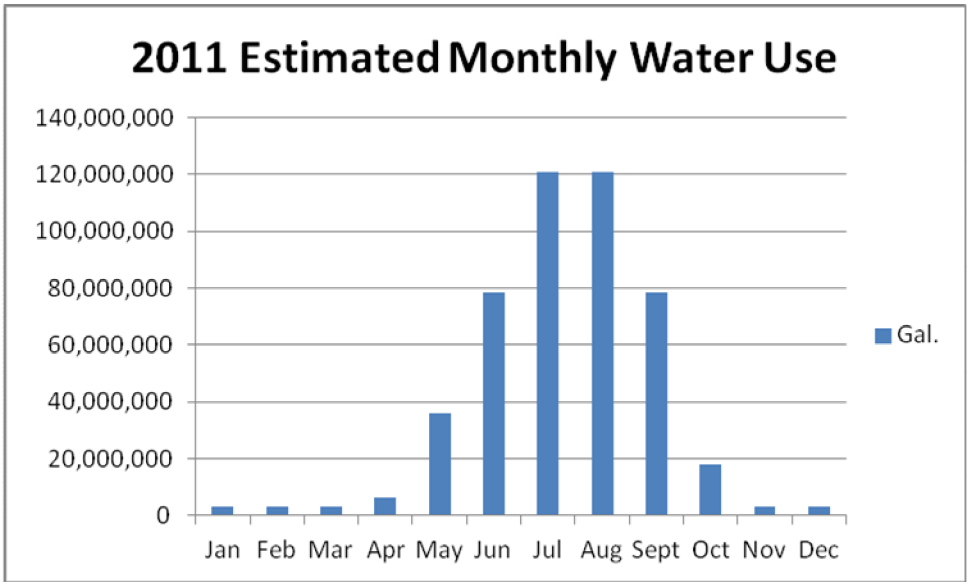


Figure 4 - Estimated Monthly Water Use by Month.

The average daily flow was calculated by summing all of the monthly volumes in Figure 3 and dividing by the number of days in the year, the result of which was 901 gpm.

By examining each day of the month of July, the maximum use day of the year was found to be July 7 and was calculated to be 3,846 gpm.

The peak hour flow was found by examining each hour during the night on or around the max day of July 7. The peak hour occurred on Independence Day early in the morning when many people were irrigating their lawns. On this day between 2:45 and 3:45 am all pumps were running and both tanks were losing volume to meet system demand. Tank water level trend lines were used to record tank level at the beginning and end of the same hour that the pumps were all running to determine additional demand. This demand volume was calculated from the geometry of each storage tank. The tank volume lost was then added to the volume of water produced by the wells to determine peak hour which equals 4,650 gpm. This also occurred under a system policy of every other day irrigation use. Those with odd numbered addresses were asked to water on selected days and those with even numbered addresses were asked to water on the other three days with Sunday as a rest day.

Assumptions, sample spreadsheets and additional explanation used to develop these system operating parameters are given in Appendix B.

In summary the system patrons demand an extremely high peak hour flow from the system during the night in the summer when lawns are being watered (14.5 gpm per connection). Peak hour flow must be supplied by the wells since the tanks do not hold equalization storage and should maintain fire flow storage at all times. On and near the max day of the year, fire flow storage is compromised with the fire flow storage water in the storage tanks used for flow equalization to support peak demand.

Since we found an hour when all well pumps were running and the tanks were losing water, it is apparent that with current use patterns in the system, the system is exceeding capacity right now and there are no redundant pumps or wells to rely on if a well is out of service during peak hour and on or near the maximum use day of the year.

3.3.2 Unaccounted for Water

By examining the SCADA trend lines and extracting the flow data for the month of January, 2011, it became apparent that Comore Loma's water system has very low leakage or unaccounted for water as indicated by the average winter day flow of 67 gpm. With the amount of pipe laid underground and in hilly terrain, it must be a very tight system in order to operate Well 2 only one-third of the time (200 gpm/3) during the winter months to provide adequate water for system demand. Figure 4 also illustrates a large differential of water use from winter months to peak summer months.

This is the only way we could consider the unaccounted for water in the system since the wells do not have flow meters. Additionally, written daily flow records are not kept on the wells with flow meters nor are flow data stored on the SCADA system. The system also does not have end-use meters to provide a basis for determining loss. If a leak does occur, the fine grain soils beneath the water system ensure that the leak surfaces and becomes noticeable to the operators so it can be repaired.

3.3.3 Wells and Well Pumps

Water supply for the system consists of five wells: Well 2, Well 3, Well 4, Well 5 and Well 6 as discussed in Section 3.2. Well 1 is small and is no longer in service. The well logs and pump curves for each well are given in Appendix A. Flow capacities are given on Table 1 in Section 3.2. Well 6 and Well 5 are operated with a VFD. Well 5 pump system was converted from submersible to a line-shaft pump in 2012.

When considering water supply for all zones in the system and applying the redundancy requirements of the Idaho Drinking Water Rules, (Subsection 502.17, from here forward called Rules), the system currently falls short 1,900 gpm under peak flow conditions and 2,032 gpm when considering the maximum day demand plus fire flow condition.

3.3.4 Booster Pump Stations

Two booster pump stations pump water from Zone 1 to Zone 2 for use in Zones 2 and 3: Sagewood and Middlefork. Sagewood consists of two sets of two series pumps with each series of pumps drawing about 15 Hp. One set of these pumps, assuming one is out of service to satisfy Rules requirements for redundancy is estimated to pump about 130 gpm. This booster pump station is located out of site underground in a concrete vault. It is time tested and functions well. The Rules no longer encourage this type of construction in part due to safety reasons associated with confined space and the threat of loss of equipment with a broken pipe.

Middle Fork BPS consists of four 30 Hp pumps. It is estimated that three of the four pumps acting together can pump 1,020 gpm. Middle Fork BPS is located in an underground concrete vault. Middle Fork BPS is also time tested. However, applying the Rules to pumping water to Zone 2 under peak hour demand when considering the redundancy requirement of the Rules (Subsection 502.17), these booster pump stations fall short 1,102 gpm when judged against current peak hour demands.

When considering max day demand plus fire flow and considering the redundancy requirement of the Rules, the BPS's combined with the lack of fire flow storage in the Tank 2 storage tank fall short 1,219 gpm. Calculations illustrating this are given in Appendix A under the title Existing System Analysis. Thus the max day flow condition of 1,219 gpm is the worst-case shortfall at this time for these flow conditions.

The system cannot provide adequate fire flow plus average daily flow during a loss of power because primarily Tank 2 does not have available storage for 180,000 gpm of fire flow. Thus a generator is required to supply the shortage of fire flow storage in Tank 2. This generator would have to supply a minimum of 506 gpm.

There is one smaller booster pump station in the system which elevates the pressure to a few homes at the end of a cul-de-sac in Zone 1 on Ensenada Circle. This BPS is included in the model, is functioning adequately but is only locally used. It is not the focus of this report and is not discussed further.

One booster station labeled as the Zone 3 Booster Pump Station in Figure 3 pumps water from Zone 2 to Zone 3 and is located next to Tank 2. This booster pump station is also called the Tank 2 Booster Pump Station in this report. The Tank 2 BPS pressurizes Zone 3 with a pair of 15 Hp centrifugal booster pumps. These pumps are currently the sole water supply for Zone 3. The capacity of one pump is calculated to be 150 gpm. Both pumps operating in parallel can provide approximately 240 gpm. Including redundancy requirements, this is 90 gpm short of needed peak hour demand and 1,548 gpm short of maximum day demand plus fire flow. There is also no standby power to operate this pump station. This BPS has had operational problems. Air is entrapped on the suction side of the booster pumps as the pumps draw water from the pipe entering Tank 2 instead of directly from Tank 2. This was always considered an interim pump station to be retired after Big Bend BPS and Tank 3 are commissioned for service.

A future booster pump station, Big Bend BPS, designed to draw water from Zone 2 and pump to future Tank 3 to service Zone 4 and Zone 3 was submitted for approval as part of the Division 25 submittal to DEQ in 2007. The booster pump station was also designed to supply water to Zone 3 through the use of Pressure Reducing Pressure Sustaining Valves (PRPSV's). This booster pump station remains under construction. Due to low interest in new homes the BPS is partially complete and on hold. It is also suspected that the outcome of this study may modify how this BPS is eventually completed.

The pump curves for each pump station and charts that illustrate their operation are given in Appendix A.

3.3.5 Storage Tanks

The system contains two storage tanks: Tank 1 in Zone 1 holds 100,000 gallons and is 16 feet high. Tank 1 is made of cast-in-place concrete and is over 40 years old. It has had some wall leakage in the past 10 years and has been repaired. It is only partly filled during the winter so as to not encourage degradation due to wall leakage under cold conditions. The tank has no equalization storage capacity. With current fire flow requirements of 1,500 gpm it does not have sufficient capacity to hold the water necessary for fire flow that is needed when fighting a fire simultaneous with max day flows and any well out of service as determined necessary by the Rules. Based on current system requirements the tank should be no less than 222,000 gallons.

Tank 2 in Zone 2 holds 200,000 gallons and is 20 feet tall. It is a bolted steel tank installed in 2004. The full capacity of the tank is utilized year round. The tank has no equalization storage capacity. This storage tank also has limited fire flows storage based on the current well and booster pump configurations. Currently this tank should be a minimum 261,000 gallons.

A third tank, Tank 3, was submitted for approval as part of the Division 25 submittal to DEQ and is scheduled to hold 300,000 gallons. This tank was designed to pressurize Zone 4 by gravity and to supply Zone 3 through the Pressure Reducing Pressure Sustaining Valves (PRPSV's). This tank, if constructed as planned, would have adequate fire flow and standby storage and limited equalization storage. Tank 3 has not been constructed.

Calculations illustrating the above findings are given in Appendix B on two 11x17 sheets of paper with the title Existing System Analysis. Each zone is considered. First all zones considered together, then Zones 2, 3 & 4, then Zones 3 & 4.

3.3.6 SCADA System

The system booster pump stations and wells are operated automatically by a SCADA system. Well pump start is determined by the water elevation of Tank 1 and the suction side pressure of Middle Fork BPS. Booster pumps start and stop depending on the water level in Tank 2.

3.3.7 Water Distribution Pipes

The water distribution pipes are constructed almost entirely of PVC pipe. Some early pipe may have consisted of some solvent weld piping. Most piping in the system is gasketed C900. There are no available data that indicates where and how much solvent weld pipe is in the system. Sizes of the main line pipes are shown on Figure 2.

Most of the service lines are two inch. The newer services in the later divisions near the top of the hill around Tank 2 and Division 25 are one and one-half inch.
The services do not have water meters. Division 25 was installed with water meter boxes with a curb stop placed in the center of the box at the base of the box. The meter boxes

were in essence used as curb stop boxes in lieu of standard curb stop boxes in order to meet the requirements of subsection 542.12 of the Rules.

3.3.8 Water Model

A water model was constructed and calibrated to match existing conditions. We flowed six hydrants, took pressure measurements one hydrant away from the flow hydrant, then duplicated actual field conditions with the model by setting tank level, pumps running and demand to actual conditions at the time of the tests. The SCADA system data were very useful for this exercise. In each case, model performance is predictive of actual conditions within 11 percent. The middle Sagewood calibration point is suspect because of uncertainty of line sizes in the area and the later discovery of a nearly closed valve on the Sagewood main line between this calibration point and Tank 2. Model assumptions, inputs, calibration data and outputs are provided in Appendix B to illustrate the calibration and accuracy of the model to existing conditions. The calibration points are shown on the modeling software output map labeled, “Sample Output, Scenario: HYD 3, Max Day + Fire Flow @ 1,500 gpm.” Zone 3 was modeled but not calibrated by flowing hydrants due to a lack of Tank 2 BPS capacity under fire flow conditions.

We ran the water model in Zones 1 and 2 using a fire flow of 250 gpm with current maximum day flows on selected hydrants which represent the extremes of Zone 1 and Zone 2. We selected hydrants near the top of both zones where available pressure is low but hydrants are closer to tanks or wells and hydrants at the bottom of the zones where pressure is plentiful but the lines to the hydrants are longer (which tends to produce more line losses). We ran two scenarios for each hydrant: Well 5 on and Well 6 off and Well 5 off and Well 6 on. These conditions produced little variation. This amounts to 48 different model runs. The distribution system is capable of delivering fire flow at this level at all locations. Pressures drop below 20 psi in the vicinity of Tank 2 which occurs by design. A summary of the selected 24 hydrants tested under the Well 6 off condition and the WaterCAD report for the Hydrant 3 run are given in Appendix B.

We also ran the water model in Zones 1 and 2 using a fire flow of 1,500 gpm with current maximum day flows. We used the same hydrant set used for the 250 gpm fire flow analysis and ran the same scenarios. Most of the system produced good results but there were areas discovered that are not capable of delivering 1,500 gpm. The scenario with Well 6 off produced the worst results. A summary of the selected 24 hydrants tested under this condition and the WaterCAD report for the Hydrant 3 run are given along with a map to accompany the summary that shows all nodes with pressures calculated to be less than 20 psi at the ground. These items are also included in Appendix B. The area around Powerhouse Drive, Bowman Lane, Cliffside Lane and Marble Circle also appear to not support 1,500 gpm fire flow. The reason is attributed to too small of main lines. The low pressure nodes in the Division 25 area are in Zone 3 and were not modeled in this scenario for the reason stated in the first paragraph of this subsection. The other low pressure area occurred just below the Middle Fork booster pump station on Middle Fork Drive. These nodes showed low pressure because Well 6 was turned off and water would have to come all the way from Well 5 and Tank 1 to provide fire flow to this area. This area is vulnerable to low pressures under large fire flows when Well 6 is turned off. The end of Ensenada Circle certainly cannot provide 1,500 gpm as it is supported by a small booster pump station capable of approximately 100 gpm. A hydrant about 1,000 feet away would have to be relied upon for large fire flows at the cul-de-sac on Ensenada Circle. The typical low pressures near Tank 2 are also made apparent.

3.3.9 Pressure

Due to the elevation change and zone requirements the system pressure varies substantially throughout the system. Some parts of the lower reaches of Zone 1 and Zone 2 may have pressures exceeding 100 psi according to the model. Over the course of years, system operators have managed high pressure conditions with local homeowners by installing individual Pressure Reducing Valves (PRV). In extreme cases such as Powerhouse Drive a PRPSV's was installed on the main line to reduce line pressure to a manageable level. The system today seems to satisfy the Rules while providing acceptable water pressure to each home.

There have been some complaints of low system pressure from homeowners located on the southeast corner of the intersection of York Road and Sagewood in Zone 2. Calculated from the hydrant just south of the intersection in front of the troubled homes, the static pressure should be 64 psi when Tank 2 is full and 55 psi when Tank 2 is empty. We conducted a monitoring exercise for 12 days at this hydrant and verified that pressure had dropped below 40 psi. However we could not duplicate this pressure drop with the model. There may be some kind of obstruction in the line between the tank and the hydrant that is causing excessive pressure drop during peak flow. This could be in the form of a partially closed valve or smaller pipes in the ground than what was recorded at the time of construction. Later excavation and examination by the operators of the suspect valve determined that indeed the valve was nearly closed and the valve shaft broken in that position. This problem will be eliminated with replacement of the valve.

3.3.10 Water Quality & Monitoring

We researched the DEQ data base for the Water Corporation and found the violation history of water quality testing. The system has not had a coliform outbreak since 2005. At no time in the data reaching back to 1980 has the system had MCL violations for any other constituent or contaminant. The system has had many monitoring violations. To the system's credit each violation was corrected. The system water quality appears to be compliant with the Safe Drinking Water Act.

3.3.11 Sewage

Every home in the subdivision is served with an individual on-site sewage disposal system.

3.3.12 Flooding & Fire

There are no known flooding events that have occurred that have had significant harmful effects to the drinking water system and its various structure and sources. Although there are gullies and low areas that could potentially flood during brief periods of intense rainfall or rain on snow and ice events. These areas are considered through the county review process when each division in the community is approved for development. Natural drainages remain in place even though development has occurred around them.

Range fires are a real hazard in Comore Loma, especially when a wet spring gives way to tall grass and rich undergrowth in the sage brush prairie. The author recalls a range fire that occurred in about 2007 that came very near a few homes. Homeowners seem to appreciate the buffer that a large irrigated lawn provides against the threat of range fires.

3.3.13 Water Rights

The system currently has 8.23 cfs of water right licenses and 6.5 cfs of water right permits for a total of 14.73 cfs or 6,611 gpm. Proof of these rights and permits are given in Appendix A.

3.3.14 Findings & Deficiencies

In summary, storage and pumping were analyzed against the peak hourly flow requirements, maximum day plus fire flow requirements, and average daily flow requirements plus fire flow when the power goes out to determine system deficiencies. Our calculations also determined that system storage tanks do not have any equalization storage capacity when a 1,500 gpm fire flow storage is applied to each storage tank. Well and booster pump redundancy requirements were considered in developing this table. Table 3 gives a summary of existing system deficiencies.

These deficiencies are now described in more detail. These details correspond to the second row of the table data which is how the system is currently operating. We discuss the second row before the first row because the second row depicts current operating conditions. Showing this row second makes this table consistent with a table given latter.

1. When evaluating well capacity with any well out of service (as required by Rules), the system is lacking 2,032 gpm of well capacity to provide needed redundancy of water supply while providing needed fire flows in Zone 1. This is the max day plus fire condition. This is due to the application of 1,500 gpm fire flow and the small size of Tank 1. If Tank 1 held all needed fire flow storage, the system would still lack 1,900 gpm of well water supply to satisfy peak hour needs.

2. Tank 1 lacks sufficient fire flow storage for 1,500 gpm fire flows in the range of 120,000 gal. Although Tank 1 was suitable for system requirements when fire flow requirements were at 250 gpm (before August, 2003), it is now desirable to try to supply up to 1,500 gpm of fire flow for two hours to every user. With the current storage tank, additional flow requirements during a fire would have to be made up by having a generator to operate a large well during times of loss of power and additional well supply during the maximum day flow conditions. Existing Tank 1 would be sufficient to meet these requirements if the system had 2,032 gpm of additional well supply capability right now and a generator on an existing well that was always operable at no less than 932 gpm.

Table 3 - Summary of Existing Deficiencies

Existing System Analysis Condition	Flow Parameters gpm	Flow Equalization	Well Supply Deficiencies gpm	Zone 1 Storage gal	Zone 1 Emergency Well Supply Deficiencies gpm	Well/BPS Supply Deficiencies for Zones 2, 3 & 4 gpm	Zone 2 & 3 Storage gal	Zone 2 Emergency Supply Deficiencies gpm	Zone 3 BPS Supply Deficiencies gpm	Zone 3 Emergency Supply Deficiencies gpm
Lower Overall Water Use with Conservation & Policy Changes	ADF/home = 2.3 MDF/home = 8.3 PHF/home = 10	No	833	100,000	936	638	200,000	506	1,548	1,505
Continue Current Water Use Patterns	ADF/home = 2.8 MDF/home = 12 PHF/home = 14.5	No	2,032	100,000	936	1,219	200,000	506	1,638	1,505

3. Fire hydrant spacing in the oldest parts of the system is also marginal when judged by current county standards of 500 feet between hydrants. Approximately 24 hydrants are missing. Those homes in the vicinity of excessive fire hydrant spacing incur additional risk of fire loss. There are also a few known main line valves that have failed. One failed valve was noted earlier in this report. Operators are in the process of determining the number of inoperable valves.

4. Tank 2 does not have sufficient fire flow storage to fight a 1,500 gpm fire at max day flows. Approximately 61,000 gallons are lacking. Due to the lack of storage, the fire flows must be made up by booster pumping. The booster pumping deficiency from Zone 1 to Zone 2 is 1,219 gpm. Through the use of PRPSV's, future Tank 3 will be able to supplement Zone 2 fire flows which would in effect lessen the storage shortage. But the booster pumping capacity from Zone 1 to Zone 2 would remain deficient at 1,102 gpm to satisfy peak hour needs.

5. During a loss of power and due to limited fire storage in Tank 2, the system cannot provide needed fire flows to Zone 2 equaling to 506 gpm. This would not be a deficiency if the system had a generator on the Middle Fork BPS capable of pumping a minimum of 506 gpm.

6. The Division 25 water supply design submitted to DEQ for approval in 2007 earmarked the booster pump station at Tank 2 serving Zone 3 for retirement once Tank 3 and the PRPSV's between Zone 4 and Zone 3 were constructed. This plan was reconsidered as part of this study. There is merit to consider this booster pump station to be a permanent fixture in the system. With this plan in mind, we verified that the pressure generating capacity of the existing 15 Hp pumps in this booster pump station are inadequate for the highest homes in Zone 3 at needed flow requirements. These booster pumps cannot generate sufficient pressure to serve homes along Cove Creek Circle. These pumps will have to be replaced with pumps fully capable of providing pressure exceeding 40 psi at the tap to all homes and also provide fire flows plus max day flows at 20 psi. Additionally, to provide fire flow water to all Zone 3 homes in Division 25, the water main lines in Zone 3 would have to be looped. In summary, either Tank 3 and the Big Bend BPS must be constructed or Tank 2 BPS needs to be upgraded to provide fire flow plus max day flow and the Zone 3 piping in Division 25 looped. Current booster pumps fall short of projected need by1,638 gpm.

7. Water service cannot be provided to Zone 4 homes until Big Bend BPS is constructed. Service to Zone 4 homes will not be available until Tank 3 is constructed. Construction of Tank 3 would also eliminate the need for the Tank 2 BPS to provide fire flow to Zone 3 in Division 25.

The first row in this table depicts the deficiencies if the system was operating with current conditions modified to include additional policy and conservation measures so that peak flow never exceeded an average of 10 gpm/connection. The peak flow is reduced 31 percent and the max day flow is reduced 31 percent compared to the second row of data. These water supply deficiencies include well redundancy and booster pump redundancy requirements of the Rules as well as the same limitations due to lack of fire flow storage as the first row of data.

The spreadsheet calculations used to develop these findings are given in Appendix B.

3.3.15 Financial Status of Water Corporation

From the Comore Loma website (http://www.clwcorp.net), the 2012 financial statement was found and printed. Receipts equaled a little more than $247,000. Based on the 2012 rates on the system website, an average of $772 was collected from each user. Near the end of the year 2012, the board raised the system rates for 2013 on a graduated scale of 25 percent for those sprinkling 0.5 acre to 100 percent to those sprinkling up to 4.8 acres. The Corporation expects to raise $373,000 with the new rates.

Expenditures equaled a little less than $366,000 dollars for an operating loss of nearly $119,000 in 2012. This can be attributed to an unfortunate set of circumstances regarding the loss of Well 6, Well 3 and Well 4 simultaneous with an upgrade to Well 5. Well 5 was converted from a submersible to a line-shaft type pump system. See the email to Paul Scoresby dated February 12, 2012 in Appendix D for a detailed breakdown of the unusually high O&M cost for 2012. In addition, the system has invested in a spare submersible pump and motor to be used in Well 3 or Well 4 and a spare motor to be used with either Well 5 or Well 6 to eliminate purchase and delivery time when the next failure occurs.

Table 4 gives an estimate of normal O&M costs, the actual 2012 costs and the 2013 budget.

Table 4 – Current O&M Costs

Item No.	Expenditures	Normal Year Costs	2012 Actual Costs	2013 Budget
1	Power	$152,800	$152,800	$175,000
2	Pump & line (including short-lived assets)	$105,000	$192,800	$100,000
3	Insurance	$2,700	$2,700	$3,000
4	Accountant & management	$8,400	$8,400	$60,000
5	Water testing	$1,800	$1,100	$3,000
6	Phone	$1,600	$1,600	$1,700
7	Taxes	$200	$200	$300
8	Landscaping	$3,300	$3,300	$3,500
9	Office & post	$3,000	$3,000	$3,400
Total O&M Budget		**$278,800**	**$365,900**	**$349,900**

Had the system not experienced such misfortune simultaneous with the upgrade to the pump system at Well 5, the system would have operated near the black in 2012. The 2013 budget includes a well house around Well 5, which is estimated at $40,000. The 2013 budget also includes significantly more management and operator time to help the system control its water use.

To correct the operating loss, restore reserves, and prepare for multiple high dollar capital improvements, the system board issued a one-time special assessment to all patrons in 2013 of $750. This raised $262,000.

The 2012 financial statement, the 2012 and the revised 2013 quarterly rate schedules are provided in Appendix D.

3.4 System Administration & Management

Comore Loma is a Water Corporation registered with the Secretary of State in 1974. A copy of the 2012 annual report is given in Appendix G. The system operates by three key documents: Amended and Restated Articles of Incorporation, Bylaws and a Water System Development Agreement it holds with Co-more Development, Inc., who is the developer of the subdivision and its water system. These documents are also provided in Appendix G.

3.5 Cross Connection Control Program

The Water Corporation maintains a cross connection control program. The cross connection control policy of the Water Corporation is given in Appendix G.

4.0 NEED FOR PROJECT

4.1 Health, Sanitation, and Security

To provide a safer and more reliable drinking water to its patrons, the Comore Loma Water Corporation must enhance its water supply infrastructure by adding additional storage so that available fire flow storage is not used for equalization. To do this, the system must either build storage tanks that have equalization volume in addition to fire flow volume or it must keep enough wells and booster pump stations active in the system with redundancy to always be able to meet peak hour flows and maximum day flows combined with fire flows while maintaining available fire flow volume in the storage tanks.

Additionally, the patrons have shown a determination to continue using a large amount of water for outside irrigation. This not only has a beautifying effect for the community, but also gives significant protection against the very real threat of wildfires. Asking the water system to provide water at the current level requires an extraordinary demand for costly infrastructure and water rights. This compounds the need for additional wells and booster pump stations.

4.2 System O&M

4.2.1 Operational Concerns

The capability of the water supply system has simply been overwhelmed by a very high demand for water on the part of its patrons. We estimate that the system operates at peak hour at an average of 14.5 gpm per home. As a comparison, Falls Water Company, a system of nearly 4,000 connections east of Idaho Falls and north of Ammon serving Bonneville County residents in the Snake River Plain serving a variety of homes, averages around 2.1 gpm per home at peak hour. There are two ways to curb the demand for water: policy changes and conservation. Policy changes may lessen the amount of water used at peak hour and max day flow levels but will probably not reduce the average daily flow. These are hard to implement successfully due to the inclination of some patrons to not comply. Conservation measures like water meters provide measurable means to reduce the amount of water used and can reduce peak hour, max day flows and overall water use. Water meters can restrict the amount of water available to each user. The rate structure of quarterly fees would also be modified to make the high water users pay equitably for what they use.

Existing booster pump stations are operating at maximum capability without pump redundancy. Tank 1 is small and is aging. Due to the small size of the tank, more well supply is needed to compensate for the lack of fire flow storage in the tank. Additionally, a view of SCADA trend lines of storage tank water level revealed that the system typically uses what fire flow storage is contained in the tank as equalization storage. Thus, if a fire occurred while the supply systems were meeting max day demand flows there would not be adequate water supply to fight a fire. At current demands, more well supply is needed to meet demand. Additional booster pump capacity is needed to move water from Zone 1 to the upper zones. Expansion of water storage is also desirable to reduce the demand for more wells and booster pumping capability.

Due to the location of the system, power seems to be occasionally dirty and the system seems to be subject to occasional lighting strikes. This appears to have occurred in 2012 at Well 6 when the electronics in the VFD were destroyed. The system management have implemented measures to limit well down time by having on hand spare equipment components with long delivery times and planning for needed reserves to pay for emergency costs.

During the winter, Well's 3, 4, 5 and 6 are taken off line and winterized. Well 2 provides all needed winter time water supply to meet demands. During the summer, all wells are turned on and have a preset start order depending on the water level in Tank 1. Well 3 could be started within one hour's time if needed during the winter.

The SCADA system is in need of some programming and flow meters at each well house and BPS in order to capture key metrics that would improve system management and design. Specifically, all wells and BPS's need to have a flow meter attached, trend line produced and an accumulation of the daily flow totals. Additionally, run-time meters of each well should be programmed so how long each well runs each day is easily understood.

Tank 1 only operated at 60 percent full during the winter to protect its porous walls from further degradation which is exacerbated by the freeze thaw cycle.

4.2.2 An Expanding System

Like most growing systems, there is a continual tug-of-war between the existing users and new users added to the system through expansion by developers regarding who should pay for capital improvements. This problem cannot be fully eliminated and will continue as long as expansion continues. There are hundreds of acres, even well over a thousand acres that could be developed in Zone's 2, 3 and 4 and even a future Zone 5. System patrons must continue to find the fine line of fairness between their thirst for irrigation water and the ability of developers to provide a reasonable or sustainable amount that meets the intent of the Rules and obligations of the Water Corporation bylaws. In an effort to find fairness and focus this study on those parts of the system needing upgrading that all patrons benefit from, we will focus primarily on providing water to Zones 1 and 2 while looking toward the future to consider expandability or build out of those facilities now. With proper support, both the developers and the system board can agree to fairness of who should pay for new infrastructure.

4.2.3 Changing Regulations

In a growing community such as Comore Loma, infrastructure when installed met the requirements of drinking water rules. Over time, regulations increased. Current fire flow requirements dictated by Bonneville County are 1,500 gpm. Prior to August of 2003, this requirement was 250 gpm. Tank 1 was simply not constructed to meet this requirement. Additionally, hydrant spacing has now been limited to 500 feet. Hydrant spacing allowed by the county in the past exceeded 1,000 feet.

There has also been an increased focus by DEQ to encourage the development of system redundancy as set forth in the Rules. These requirements place a much higher burden on the water system infrastructure that was not initially contemplated when original facilities were constructed. The expansion of the system does affect the performance of water supply infrastructure. But some of these water supply elements are aging, becoming outdated and are due for consideration for replacement. This is not related to new development.

Correction of these problems whether through capital outlay or as maintenance should be done in a manner to improve fire flow to all homes, thus potentially improve fire flow ratings that result in lower home insurance and lower the risk of having the occasional period of little or no water supply during peak demand periods of the day in the hot summer months.

4.3 Growth Planning

Additional analysis was undertaken to predict future water supply needs based on build out of existing empty lots. Build out of the system assumes that every available lot that could potentially have a home throughout the entire system is included. This was carefully determined with the assistance of system staff and is shown on Figure 2. Home lots with a home are shaded. Home lots without a home are shown in white. Build out would include 214 future homes for a total of 534 homes spread across four pressure zones.

Since we do not know what the intentions of the patrons will be regarding their use of water, we discuss three operational scenarios in planning for the future. These are addressed below.

4.3.1 Operational Metrics at Build-out of System for Three Demand Conditions

Assuming that the water system begins to moderate its peak hour flow per connection average from 14.5 gpm to 10 gpm and its maximum day flow per connection average from 12.0 gpm to 8.3 gpm and average daily flow per connection average from 2.8 gpm to 2.3 gpm, future flows at build out conditions are given in Table 5. This would be possible through policy changes and conservation brought about by physical impediments to high water use rates such as the installation of water meters.

Table 5 –Build-out at 10 gpm/connection Peak Hourly Flow

Metric	Overall	Zone 1	Zone 2	Zone 3	Zone 4
No. of Homes Being Served	320	165	131	24	0
No. of Future Homes	214	41	92	65	16
Total Homes	534	206	223	89	16
Average Daily Flow, gpm	1,253	484	523	209	38
Maximum Day Flow, gpm	4,417	1704	1844	736	132
Max Day/Avg Day Ratio	3.5	3.5	3.5	3.5	3.5
Peak Hour Flow, gpm	5,340	2,060	2,230	890	160
Peak Hour/Avg Day Ratio	4.3	4.3	4.3	4.3	4.3
Averge Winter Day, gpm	113	43	47	19	3
Peak Hour/Maximum Day Ratio	1.2	1.2	1.2	1.2	1.2
Average Daily Flow/Connection, gpm	2.3				
Maximum Day Flow/Connection, gpm	8.3				
Peak Hour Flow/Connection, gpm	10.0				

Assuming that the water system begins to moderate its peak hour flow per connection average from 14.5 gpm to 12 gpm and its maximum day flow per connection average from 12.0 gpm to 10.0 gpm while maintaining average daily flow at the same level (no overall reduction of water used only the rate at which it is taken), future flows at build out conditions are given in Table 6. This may be able to happen if the system adjusted to policy changes that limited times for watering and spaced out watering over both the day and night for all users.

Table 6 –Build-out at 12 gpm/connection Peak Hourly Flow

Metric	Overall	Zone 1	Zone 2	Zone 3	Zone 4
No. of Homes Being Served	320	165	131	24	0
No. of Future Homes	214	41	92	65	16
Total Homes	534	206	223	89	16
Average Daily Flow, gpm	1,504	580	628	251	45
Maximum Day Flow, gpm	5,300	2045	2213	883	159
Max Day/Avg Day Ratio	3.5	3.5	3.5	3.5	3.5
Peak Hour Flow, gpm	6,408	2,472	2,676	1,068	192
Peak Hour/Avg Day Ratio	4.3	4.3	4.3	4.3	4.3
Averge Winter Day, gpm	113	43	47	19	3
Peak Hour/Maximum Day Ratio	1.2	1.2	1.2	1.2	1.2
Average Daily Flow/Connection, gpm	2.8				
Maximum Day Flow/Connection, gpm	9.9				
Peak Hour Flow/Connection, gpm	12.0				

Lastly, assuming that the water system continues on a course of using the same amount of water per customer, then future flows will be as shown in Table 7.

Table 7 –Build-out at 14.5 gpm/connection Peak Hourly Flow

Metric	Overall	Zone 1	Zone 2	Zone 3	Zone 4
No. of Homes Being Served	320	165	131	24	0
No. of Future Homes	214	41	92	65	16
Total Homes	534	206	223	89	16
Average Daily Flow, gpm	1,504	580	628	251	45
Maximum Day Flow, gpm	6,418	2476	2680	1070	192
Max Day/Avg Day Ratio	4.3	4.3	4.3	4.3	4.3
Peak Hour Flow, gpm	7,760	2,993	3,240	1,293	233
Peak Hour/Avg Day Ratio	5.2	5.2	5.2	5.2	5.2
Averge Winter Day, gpm	113	43	47	19	3
Peak Hour/Maximum Day Ratio	1.2	1.2	1.2	1.2	1.2
Average Daily Flow/Connection, gpm	2.8				
Maximum Day Flow/Connection, gpm	12.0				
Peak Hour Flow/Connection, gpm	14.5				

4.3.2 Alternatives for Each Set of Flow Parameters

All of the different set of flow parameters given above added to whether or not to build water storage give a multitude of alternatives for construction of needed infrastructure. Additionally, the problem persists between developers and existing customers regarding who should pay for what when the system continually takes on new users and the need for water continues to grow with the addition of new users. To break the water supply scenarios down, we prepared Table 8 which illustrates system needs under a variety of existing conditions without growth planning and under the build-out condition under the three demand conditions given above. Calculations for determining needed infrastructure for all of these flow conditions with and without future growth are included on 11x17 calculation spreadsheets given in Appendix B.

The operation of the existing system was analyzed for both the condition of reducing flow to a peak hourly flow of 10 gpm and continuing to allow 14.5 gpm. As stated previously, 10 gpm peak hourly flow would only be obtainable through conservation, policy changes and the installation of water meters. Three alternate future conditions are given for each case.

Alternatives 2 and 5 illustrate what the amount of storage needed if equalization storage were included in existing system operations in addition to fire flow storage, standby storage and operational storage. Alternatives 3 and 6 were added to illustrate how much storage would be needed if storage was provided for standby storage, operational storage and fire flow storage in each tank.

Table 8 - Comore Loma Water System Alternative Analysis Summary

Scenario	Design Condition	Flow Parameters gpm	Alt.	Flow Equalization	Additional Well Supply Needs for entire System gpm	Zone 1 Needed Storage gal	Needed Zone 1 Emergency Well Supply with Specified Tank gpm	Additional Well/BPS Supply Needs for Zones 2, 3 & 4 gpm	Zone 2 & 3 Needed Storage gal	Needed Zone 2 Emergency Well/BPS Supply gpm	Required Zone 3 BPS Supply Needs gpm	Needed Emergency Flow from Tank 2 BPS gpm	Required Zone 4 BPS Supply Needs with Tank 3 gpm	Needed Tank 3 Storage gal
Existing System	No Future Design, Lower Overall Water Use with Conservation & Policy Changes	ADF/home = 2.3 MDF/home = 8.3 PHF/home = 10	1	No	833	Use existing 100,000 gal tank	936	638	Use existing 200,000 gal tank	506	1,698	1,505	Zone 4 is not in service and will not enter into service without the construction of Tank 3 and Big Bend BPS	
			2	Yes	0	375,779	0	132	373,374	0	1,698	1,505		
			3	No	450	221,703	not required but advisable	638	Use existing 200,000 gal tank	506	1,698	1,505		
	No Future Design, Continue Current Water Use Patterns	ADF/home = 2.8 MDF/home = 12 PHF/home = 14.5	4	No	2,032	Use existing 100,000 gal tank	936	1,219	Use existing 200,000 gal tank	506	1,788	1,505		
			5	Yes	1,096	453,594	0	713	476,013	0	1,788	1,505		
			6	No	1,900	221,703	not required but advisable at 983 gpm min.	1,219	Use existing 200,000 gal tank	506	1,788	1,505		
Future System	Buildout and Continue Current Water Use Patterns	ADF/home = 2.8 MDF/home = 12 PHF/home = 14.5	7	Yes	3,668	513,378	0	2,792	706,562	0	2,570	1,519	319	252,371
			8	No	5,010	225,854	not required but advisable	3,616	Use existing 200,000 gal tank	652	2,570	1,519	239	230,219
	Buildout and Lower Peak Flows with Policy Changes	ADF/home = 2.8 MDF/home = 10 PHF/home = 12	9	Yes	2,550	461,384	0	2,105	599,930	0	2,383	1,519	159	238,923
			10	No	3,658	225,854	not required but advisable	2,786	Use existing 200,000 gal tank	652	2,383	1,519	192	220,629
	Buildout and Lower Overall Water Use with Conservation & Policy Changes	ADF/home = 2.3 MDF/home = 8.3 PHF/home = 10	11	Yes	1,667	422,129	0	1,563	540,475	0	2,236	1,519	132	235,874
			12	No	2,590	225,854	not required but advisable	2,215	Use existing 200,000 gal tank	652	2,236	1,519	160	220,629
			13	Yes	1,667	422,129	0	1,563	Use existing 200,000 gal tank	0	Use existing Tank 2 BPS Pumps	0	1,215	533,145

The operation of the future system at the build-out condition under a variety of storage tank and pumping configurations are also given. We included flow scenarios for peak hour flow planning at 10 gpm/connection, 12 gpm/connection and 14.5 gpm/connection. For each of these flow parameter cases, we calculated the needed storage for each zone for two cases: 1) fire flow storage, standby storage and operational storage; and 2) for these storage requirements plus equalization storage. Equalization storage was estimated based on our understanding of how the system operates on the max flow day of the year and when peak hour occurs. Since Tank 2 holds a goodly amount of needed fire flow storage and future Tank 3 will supplement and erase the fire flow storage deficiencies of Tank 2, we left Tank 2 in the system and only supplemented it for those scenarios that include equalization storage.

Columns with emergency in the heading indicate the need for an emergency generator and at what flow rate water would have to be provided under the loss of power. The scenarios that include equalization storage do not include the need for an emergency generator since needed fire flows are always in the storage tank.

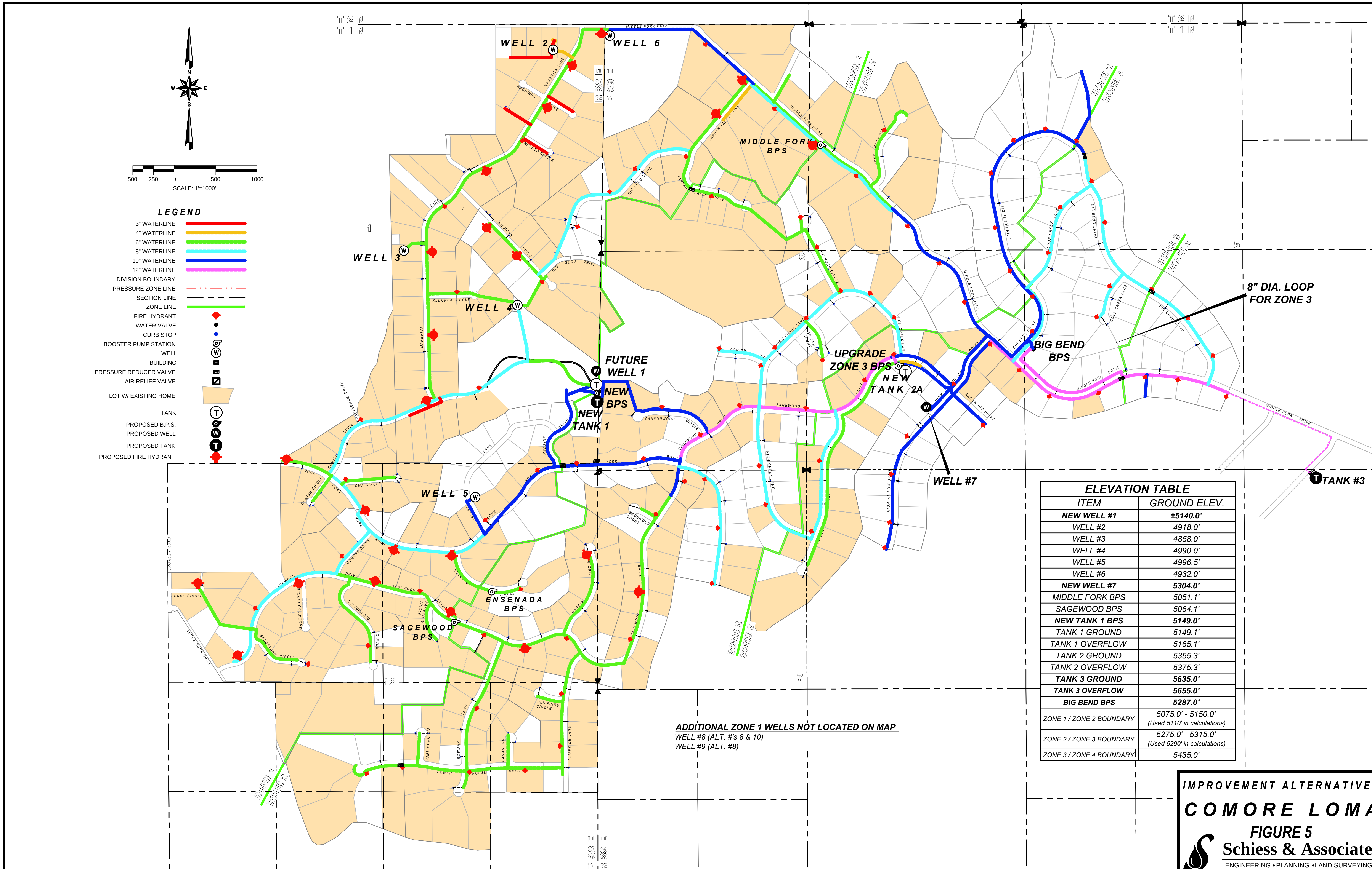
The numbers given in Table 8 illustrate the massive increases to water supply that are necessary to keep water supply up with demand and provide source redundancy. Of all alternatives, we selected Alt. 8, Alt. 10, Alt. 11, Alt. 12 and Alt. 13 for further review and scrutiny. These will be discussed further in the next chapter.

4.3.3 Needs for Zones 3 & 4

Comore Loma desires to immediately improve fire flow capacity for all users in Zone 3. Now we quantify water supply needs for Zone 3 as we did previously for the lower zones.

We ran the model to determine the maximum flow that could be moved through the Zone 3 lines between Tank 2 using the Tank 2 BPS and the highest hydrant in Zone 3 in Division 25. Using a limiting velocity of 6.4 fps in the eight inch line at the junction of Big Bend Drive and Middle Fork Drive, the maximum flow capacity of the line is 1,086 gpm. At build out of Zone 3, this flow capacity could represent max day flow with the balance used as fire flow.

We also ran the model to determine the flow capacity of the Zone 3 piping in Division 25 if the distribution piping was looped. We determined that if the piping was looped from the cul-de-sac named Cove Creek Lane along property boundaries over to Middle Fork Drive as shown on Figure 5, a distance of about 900 feet, that full fire flow could be delivered with the Tank 2 BPS at build-out. With the eventual construction of Tank 3 to supplement fire flows in Zone 3, it seems reasonable to size the Tank 2 booster pumps serving Zone 3 to pump fire flow plus current max day flows. This can be accomplished with two 40 Hp pumps and an additional 40 Hp pump on standby. Model results plus the pump sizing calculation are given in Appendix A. Upon construction of Tank 3, any fire flow deficiency in Zone 3 will be permanently eliminated. With construction of Tank 3 and Big Bend BPS, the Zone 3 loop described earlier in this paragraph is not necessary.



ELEVATION TABLE

ITEM	GROUND ELEV.
NEW WELL #1	**±5140.0'**
WELL #2	4918.0'
WELL #3	4858.0'
WELL #4	4990.0'
WELL #5	4996.5'
WELL #6	4932.0'
NEW WELL #7	**5304.0'**
MIDDLE FORK BPS	5051.1'
SAGEWOOD BPS	5064.1'
NEW TANK 1 BPS	**5149.0'**
TANK 1 GROUND	5149.1'
TANK 1 OVERFLOW	5165.1'
TANK 2 GROUND	5355.3'
TANK 2 OVERFLOW	5375.3'
TANK 3 GROUND	**5635.0'**
TANK 3 OVERFLOW	**5655.0'**
BIG BEND BPS	**5287.0'**
ZONE 1 / ZONE 2 BOUNDARY	5075.0' - 5150.0' (Used 5110' in calculations)
ZONE 2 / ZONE 3 BOUNDARY	5275.0' - 5315.0' (Used 5290' in calculations)
ZONE 3 / ZONE 4 BOUNDARY	5435.0'

IMPROVEMENT ALTERNATIVES

COMORE LOMA

FIGURE 5

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Flow requirements for existing Zone 3 and Zone 3 at build-out are also given on Table 8. Zone 4 at build-out is also given. The Zone 3 numbers assume that Tank 3 is not built and that Tank 2 booster pump station must provide water supply under all flow conditions. The Zone 4 numbers assume that Tank 3 and Big Bend BPS are built since no Zone 4 homes could be built until Big Bend BPS and Tank 3 are commissioned for service.

4.3.4 Distribution System Modeling

We ran the water model to see how well the existing distribution system could supply peak hour demand at build-out conditions at 10 gpm/connection peak hour flow. The model performed well. The results of this work are given graphically in Appendix B. Areas of low pressure include Zone 4 which is currently not being served and near Tank 2 which has lower pressure by design. It should be noted that near Tank 2 there are no services on the Zone 2 mainline where pressure is below 40 psi.

Since there are way over a thousand acres available for continued development around and above the current platted area of the system, there is high potential that the system will eventually expand beyond build out conditions. In fact, more platted divisions will certainly be added before build out of the existing platted divisions occur. The timing of future events and what pressure zones new divisions will fall into are uncertain. Discussion of this is speculative and dependent on many variables that cannot be addressed in this study.

5.0 ALTERNATIVES CONSIDERED

5.1 Optimization of Existing Facilities

As demonstrated in earlier sections of this report, the water system is at capacity given current use patterns and has exceeded capacity as is the case with well supply and with Tank 1. The system needs more water supply and water storage. Optimization of existing water supply wells and tanks will not satisfy the need for additional wells and more storage.

5.2 Interconnection with Other Water Systems

The nearest water systems are the City of Ammon to the north and Blackhawk development to the south. Geographically, there are ravines that separate each water system. Politically, since Ammon and Comore Loma are different entities serving different patrons with different goals and objectives, we do not see this as possible. Blackhawk is a newer subdivision that would compete with Comore Loma for new home construction. Blackhawk is significantly smaller than Comore Loma. Water rights are also a concern as they are granted to a water purveyor only to be used within the service area of a water purveyor. Connection to Blackhawk would require complete unification of systems. Even though Blackhawk is more culturally aligned to Comore Loma than Ammon, we see no reason why Comore Loma would benefit by incorporating a smaller water purveyor into the system. Who would pay for all of the legal fees to join, consolidate water rights, adjust service boundaries, convince Blackhawk to merge, connect the systems and restructure the pressure zones of Blackhawk to match those of Comore Loma? We do not see interconnection of water systems to Ammon or Blackhawk as warranting further analysis.

5.3 Developing Centrally Managed Small Cluster or Individual Facilities

Comore Loma was developed as a centrally managed water system with individual wastewater disposal systems. Water on the eastern hillsides is spotty, deep and occasionally unobtainable. There is also a chance that new well drilling may also discover hot water. For this reason, all wells are near the bottom of the hill in Zone 1. A test well for future Well 7 was drilled near Tank 2. It is estimated that this well will turn into a production well for the community. Generally the further up the hill the community goes, the more difficult water becomes to find and develop for use. The system began as a community water system and intends to remain that way.

5.4 No Action

The system is short on redundancy, overall well capacity, storage capacity and emergency power supply. No action would continue to see the water system operate with considerable risk to customers regarding fire flow availability and adequate water supply and pressure during the hot summer months and when the power goes out. Those in Zone 3 are particularly at risk.

5.5 Alternatives for New Water Supply & Distribution

In the last chapter, Alternates 8, 10, 11, 12 and 13 were identified as reasonable alternatives to improve water supply and storage and thus are considered in more detail in this chapter. These four alternatives encompass a wide range of means and methods concerning how much water on average each home will be allowed to use and what and how the wells and pumping stations and tanks would have to be configured to make that possible. Simply put, we will set target demands for each alternative and then illustrate one or more methods to make achieving the target possible. These alternatives give a variety of demand targets, storage tank sizes and the size and amount of wells and booster pump stations and distribution system improvements to make that possible. The items included with each alternative are outlined on Table 8. We first evaluate distribution system needs and general pump station improvements, then turn our attention to improvement alternatives to increase water supply.

5.5.1 Distribution System Improvements

The system needs 24 fire hydrants to comply with current Bonneville County spacing requirements. Additionally, the system board wants to budget for valve replacement of non-functioning valves. We will assume there are 20 valves that need replaced. An estimated cost of for this work is given in Table 9.

Table 9 – Distribution System Improvements

Item No.	Distribution Improvements	Units	Quantity	Unit Cost	Extended Cost
1	Cut fire hydrants onto existing main lines	EA	24	$3,500	$84,000
2	Replace broken valves	EA	20	$2,000	$40,000
3	Asphalt repair	EA	25	$500	$12,500
4	Traffic control	LS	1	$5,000	$5,000
5	Mobilization (5% of bid)	LS	1	$7,000	$7,000
Subtotal construction					**$148,500**
Engineering @ 10%					**$14,900**
Total					**$163,400**

These improvements are applicable to all alternatives evaluated in this chapter.

Some of the alternatives evaluated in this chapter use conservation and policy as a tool to reduce the amount of water consumed and the rate at which water is taken from the system. Our opinion is that a reduction in water usage will only be accomplished with water meters. Table 10 gives an estimate to accomplish installation of a one inch water meter at every service.

Table 10 – Estimate of Cost for One-inch Water Meters Installed on all Services

Item No.	Distribution Improvements	Units	Quantity	Unit Cost	Extended Cost
1	New water meters, Mueller box, lid, insulation, installation, 1"	EA	320	$1,640	$524,800
2	Hand-held device and software	LS	1	$20,000	$20,000
3	Mobilization (5% of bid)	LS	1	$27,200	$27,200
Subtotal construction					**$572,000**
Engineering @ 8%					**$45,800**
Total					**$617,800**

If some desire a larger meter, we would suggest that they be asked to pay the price difference out of pocket and be prepared to pay a larger base fee compared with those who are willing to limit their rate of water use.

In order to provide fire flow at a reasonable level in Zone 3 by improving the Tank 2 BPS and without the completion of Big Bend BPS and Tank 3, the Zone 3 piping in Division 25 will have to be looped as shown on Figure 5. Table 11 gives a cost estimate for this loop.

Table 11 – Estimate of Probable Cost to Loop Distribution Piping in Zone 3 of Division 25

Item No.	Distribution Improvements	Units	Quantity	Unit Cost	Extended Cost
1	8" PVC pipe	LF	900	$35	$31,500
2	8-inch valves	EA	2	$1,200	$2,400
3	8-inch elbows	EA	4	$1,000	$4,000
4	12-inch tee	EA	1	$1,800	$1,800
5	Asphalt Repair	LF	30	$30	$900
6	Traffic Control	LS	1	$500	$500
7	Easements	EA	2	$500	$1,000
8	Mobilization (5% of bid)	LS	1	$2,000	$2,000
Subtotal construction					**$44,100**
Engineering @ 15%					**$6,600**
Total					**$50,700**

This loop is a desirable addition to all alternatives discussed in this chapter except for Alt.13. With Big Bend BPS and Tank 3 constructed the loop is not needed since the pressurization of Zone 4 creates two pathways for water to flow to Zone 3 through PSPRV's. No other water main line improvements besides those discussed in this subsection are contemplated at this time.

5.5.2 General Pump Station Improvements

Flow Meters in All Booster Pump Stations and Wells

To better manage the system, we recommend a flow meter be added to each well house and booster pump station. A flow meter is needed at Well 2, Well 3, Well 4 and Well 5. Magmeters are the meter of choice. Additionally, Middle Fork and Sagewood BPS's should also be fitted with a flow meter. Estimating an average of $6,000 per meter that includes installation we have budgeted $36,000 total for meter installation at all well houses and booster pump stations. These should also be incorporated into the SCADA system at a cost of approximately $1,000 per pump station for an additional $6,000. For flow metering improvements, $42,000 will be budgeted. These metering improvements are necessary and included as part of each alternative.

Zone 3 Booster Pump Station Improvements

Per the discussion of Subsection 4.3.3, we are allocating $110,000 to rehabilitate the Tank 2 booster pump station in all alternatives discussed in this chapter except for Alt. 13. This budget will be used to install three 40 Hp pumps for Zone 3 so that current peak hour and max day flow plus fire flow conditions can be met. Additionally, some form of generator will also be provided. A fixed generator is included when alternatives do not include equalization storage in the tanks and one portable generator is used for the entire system when flow equalization is included.

Other Improvements

As explained in subsection 4.2.1, SCADA improvements are in order to monitor flow from all wells and BPS's and flow trend lines produced to monitor flows real-time and to accumulate daily flow totals. Additionally, run-time meters of each well should be programmed to enable the operator to quickly determine how long each well runs daily. This will take considerable programming. We estimated $15,000 to make these improvements. This applies to all alternatives.

5.5.3 Water Supply Improvement Alternative 8

Alternative 8 requires the system to provide water supply to continue a peak hour water demand of 14.5 gpm per connection as shown on Table 7 and Table 8 in Chapter 4. This alternative includes improvements that would include a new storage tank at Tank 1 holding fire flow storage, standby storage and operational storage, enough additional water supply from new wells to equal 5,010 gpm. This would include a replacement well for Well 1 and Well 7 and two additional wells named Well 8 and Well 9, a new booster pump station at Tank 1 and rehabilitation of another booster pump station (Sagewood) to get enough water up to Zone's 2, 3, and future Zone 4. A schematic of this alternative is given on Figure 6.

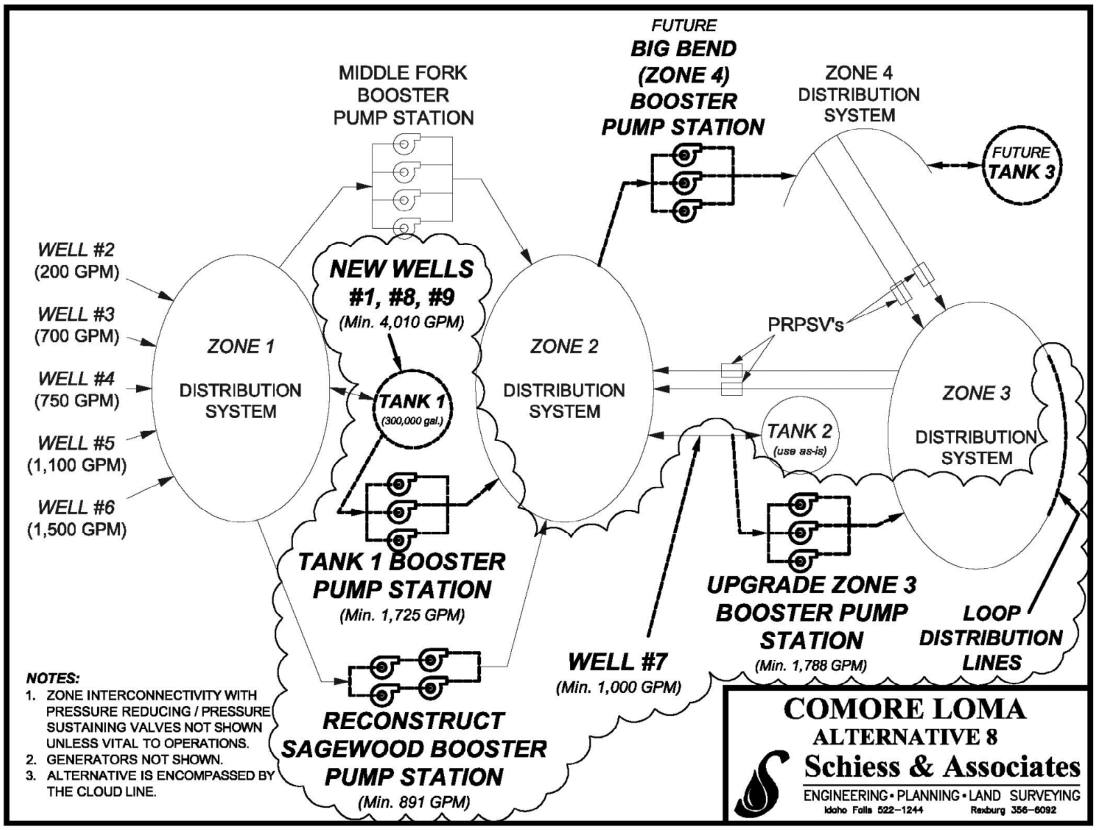


Figure 6 – Alternative 8 Schematic

The estimated capital costs to implement this alternative are given on Table 12.

Table 12 – Alternative 8 Estimate of Probable Cost

Item No.	Item	Estimated Cost
1	Replace Broken Distribution System Valves and add 24 Fire Hydrants (see Table 9)	$163,400
2	Add Flow Meters to Existing Pump Stations (See Subsection 5.5.2)	$42,000
3	Replace Well #1 with New Well Capable of Producing 1,667 gpm	$250,000
4	Well House for Well #1 with Vertical Turbine Pump and Generator (See Appendix F)	$571,800
5	Drill New Well #7 Capable of Producing 1,000 gpm	$225,000
6	Well House and Vertical Turbine Pump for New Well #7 (See Appendix F)	$373,000
7	Drill Well #8 with Capacity of 1,058 gpm	$200,000
8	Well house for Well #8 (Use same cost as Well #7)	$373,000
9	Drill Well #9 with Capacity of 1,000 gpm	$200,000
10	Well house for Well #9 (Use same cost as Well #7)	$373,000
11	Booster Station at Tank 1 Including Diesel Generator and Three Phase Power to Site Capable of 1,725 gpm (See Appendix F)	$609,200
12	Additional booster station from Zone 1 to Zone 2 (replace Sagewood BPS) with Capacity of 891 gpm (See Appendix F)	$365,500
13	Upsize Piping on Sagewood to Move Additional Water to Zone 2 (rough estimate)	$500,000
14	New 300,000 Gallon Storage Tank for Zone 1 (See Appendix F)	$306,000
15	Upgrade Tank 2 Booster Pump Station to (3) 40 Hp Pumps Including Diesel Generator	$170,000
16	Loop Zone 3 with 8 inch Pipe (See Appendix F)	$50,700
17	SCADA Improvements for Water Meters and Programming for Flow Data Trend Lines, Pump Operating Hours and Cumulative Reports	$15,000
	Total Construction & Engineering	**$4,787,600**
	Administration, Legal and Interest Costs (4% of total above)	**$192,000**
	Total Estimated Project Cost	**$4,979,600**

This estimate includes the distribution and general distribution system elements given on Tables 9, 11 and general pump station improvements and SCADA improvements given in subsection 5.5.2. Fixed emergency generators were included on one well, one booster pump station and the Tank 2 booster pump station to ensure that water is always available under any circumstances and to compensate for the lack of fire flow storage in existing Tank 2. Due to the high cost of this project we do not believe this alternative is feasible from a long term operations point of view and because of the overall cost of implementation. This estimate does not include additional water rights that would be required in addition to the existing water rights and water right permits now held by the Water Corporation and Skidmore, Inc. Thus we do not discuss it further. Rather we will look at other more reasonable alternatives that seek to reduce the peak demands for water. That leads us to Alt.'s 10, 11 and 12 which are now given in the same order.

5.5.4 Water Supply Improvement Alternative 10

Alternative 10 requires the system to provide water supply at a reduced peak hour water demand of 12 gpm per connection as shown on Table 6 and Table 8 in Chapter 4. This represents a peak hour flow reduction of 17 percent but no overall reduction in the amount of water used. This may be possible to achieve with disciplined use of the water through additional policy restrictions on when irrigation can occur. This alternative includes improvements that would include a new storage tank at Tank 1 holding fire flow storage, standby storage and operational storage and enough additional water supply from new wells to equal 3,658 gpm. This would include a replacement well for Well 1, construction of Well 7, one additional well named Well 8 and a new booster pump station at Tank 1 to get more water up to Zone's 2, 3 and future Zone 4. A schematic of this alternative is given on Figure 7.

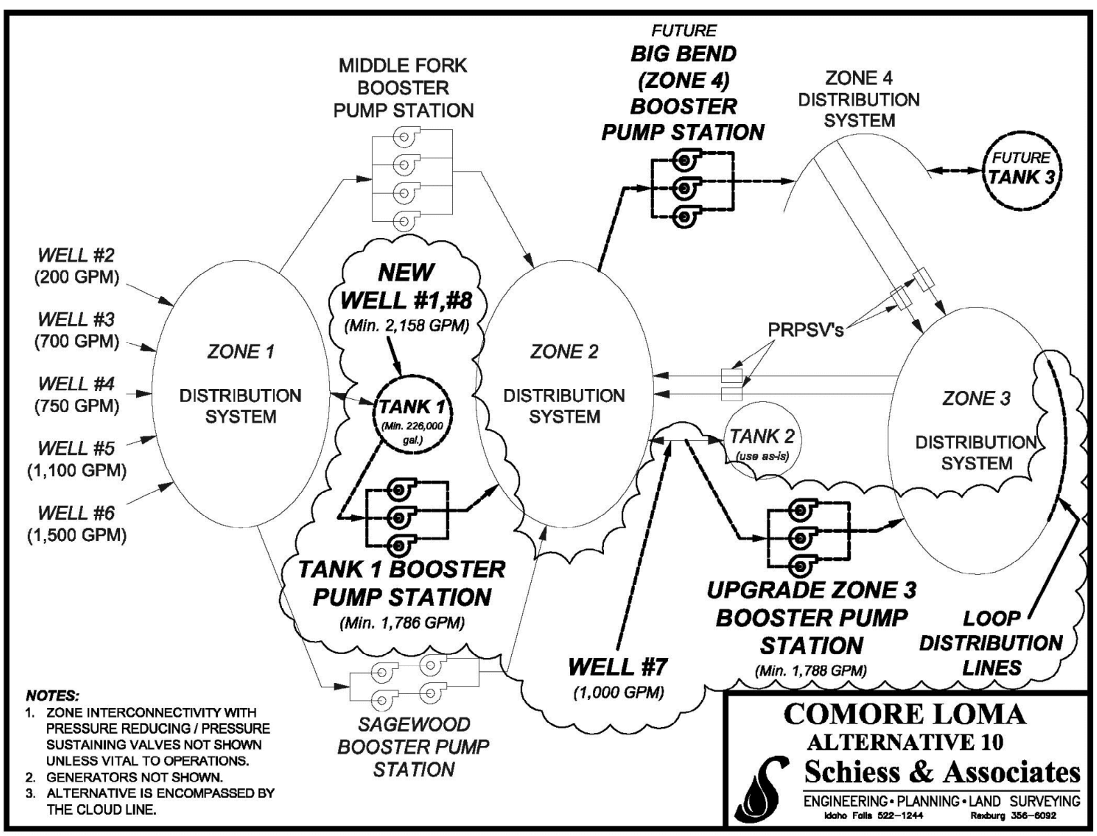


Figure 7 – Alternative 10 Schematic

The estimated capital costs of this alternative are given on Table 13.

Table 13 – Alternative 10 Estimate of Probable Cost

Item No.	Item	Estimated Cost
1	Replace Broken Distribution System Valves and add 24 Fire Hydrants (see Table 9)	$163,400
2	Add Flow Meters to Existing Pump Stations (See Subsection 5.5.2)	$42,000
3	Replace Well #1 with New Well Capable of Producing 1,100 gpm	$225,000
4	Well House for Well #1 with Vertical Turbine Pump and Generator (See Appendix F)	$448,500
5	Drill New Well #7 Capable of Producing 1,000 gpm	$225,000
6	Well House and Vertical Turbine Pump for New Well #7	$373,000
7	Drill Well #8 with Capacity of 1,058 gpm	$200,000
8	Well house for Well #8 (Use same cost as Well #7)	$373,000
9	Booster Station at Tank 1 Including Diesel Generator and Three Phase Power to Site Capable of 1,786 gpm (See Appendix F)	$609,200
10	New 300,000 Gallon Storage Tank for Zone 1 (See Appendix F)	$306,000
11	Upgrade Tank 2 Booster Pump Station to (3) 40 Hp Pumps Including 80 KW Fixed Diesel Generator	$170,000
12	Loop Zone 3 with 8 inch Pipe (See Appendix F)	$50,700
13	SCADA Improvements for Water Meters in Well Houses and Programming for Flow Data Trend Lines, Pump Operating Hours and Cumulative Reports	$15,000
	Total Construction & Engineering	**$3,200,800**
	Administration, Legal and Interest Costs (4% of total above)	**$128,000**
	Total Estimated Project Cost	**$3,328,800**

This alternative also includes the same pump station flow metering, telemetry, distribution system and Zone 3 looping improvements as Alt. 8. Fixed emergency generators were included on one well, one booster pump station and the Tank 2 booster pump station to ensure that water is always available under any circumstances and to compensate for the lack of fire flow storage in existing Tank 2. This alternative still requires significant investment in new infrastructure, but is reasonable enough to be considered further later on.

5.5.5 Water Supply Improvement Alternative 11

Alternative 11 requires the system to provide water supply at a reduced peak hour water demand of 10 gpm per connection as shown on Table 5 and Table 8 in Chapter 4. This represents a peak hour flow and max day flow reduction of 31 percent and an overall reduction in the amount of water used by 17.9 percent. This should be achievable with disciplined use of the water through additional policy restrictions on when irrigation can occur and with the use of individual water meters that would restrict the rate of water available to each user. This alternative includes improvements that would include a new storage tank at Tank 1 holding fire flow storage, standby storage, operational storage and equalization storage and a second storage tank to supplement Tank 2 and enough additional water supply from a replacement well for Well 1to equal 1,667 gpm. This project would include construction of a new booster pump station at Tank 1 to get more water up to Zone's 2, 3 and future Zone 4. A schematic of this alternative is given on Figure 8.

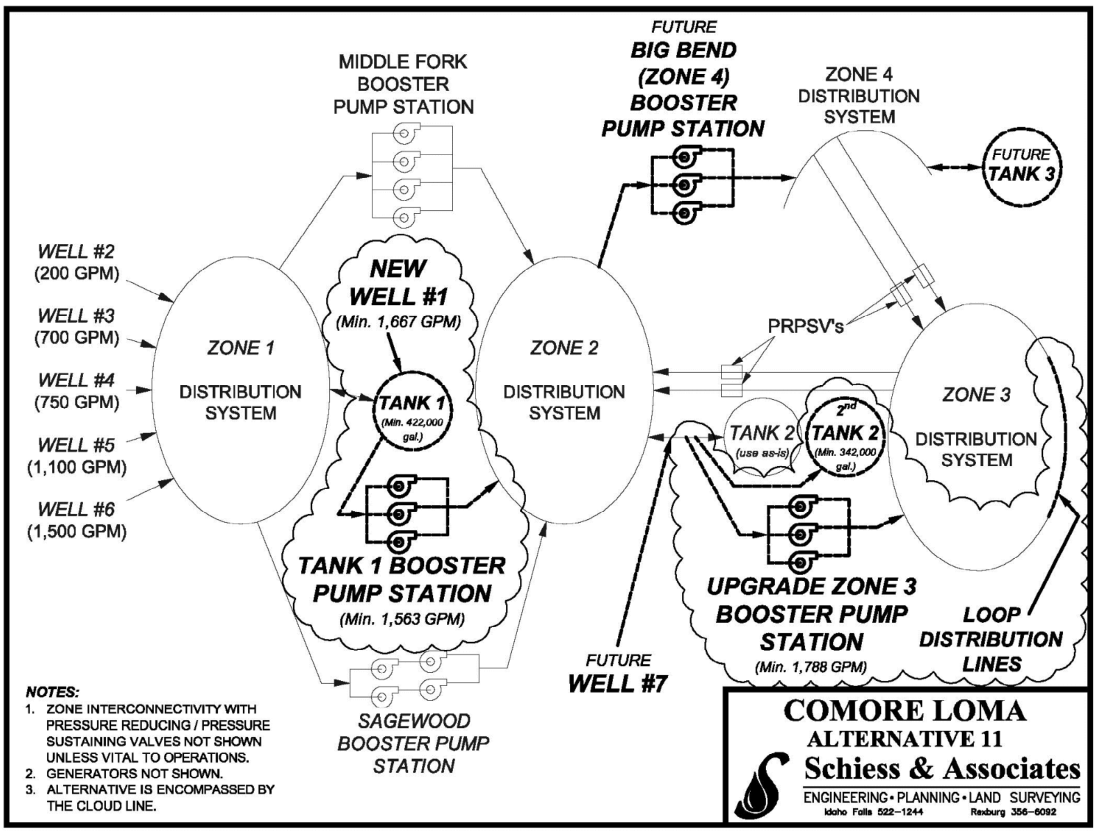
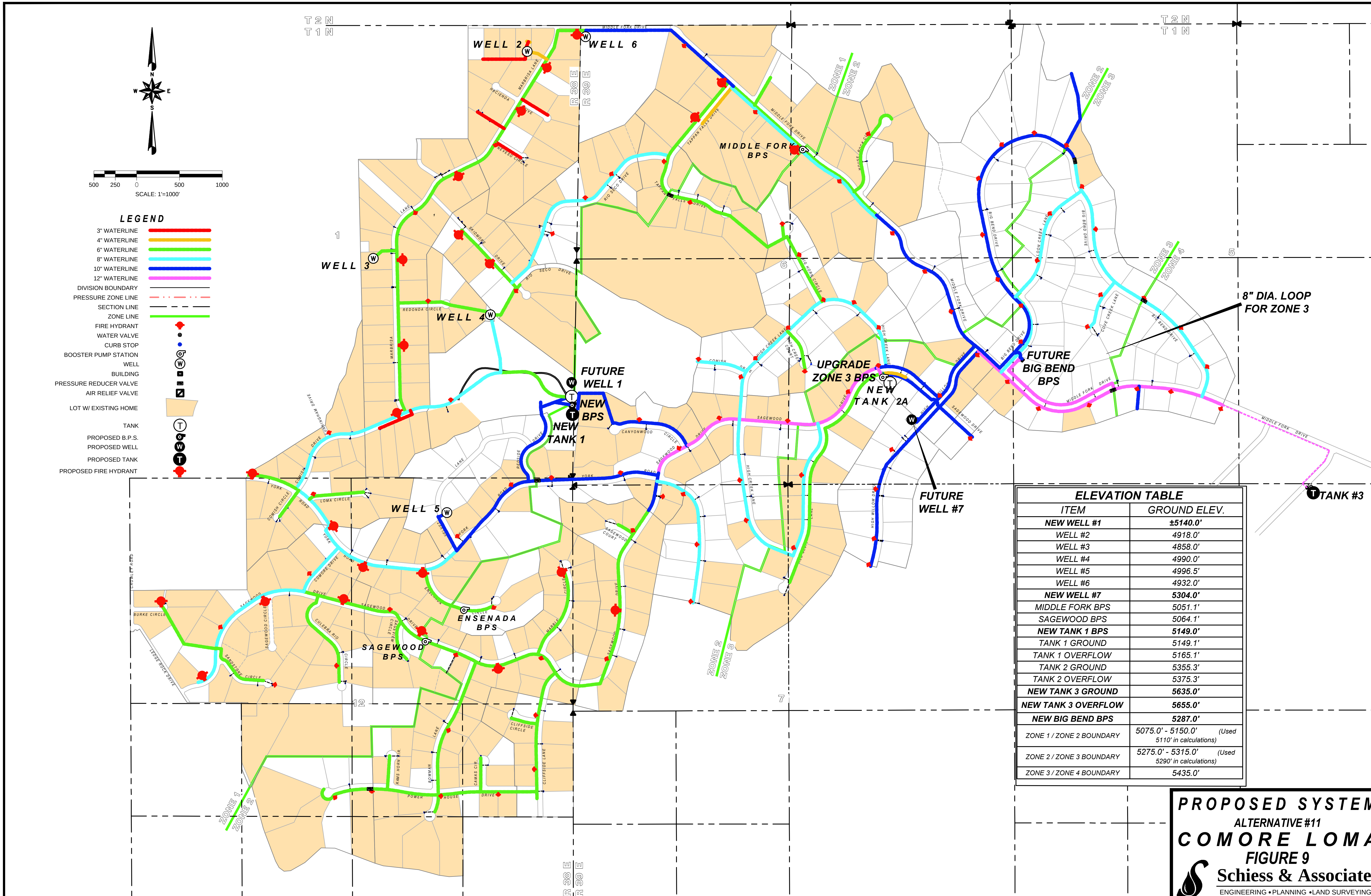


Figure 8 – Alternative 11 Schematic

A map showing the locations of the new facilities in Figure 8 is given as Figure 9.

The estimated capital costs of this alternative are given on Table 14.



ELEVATION TABLE	
ITEM	GROUND ELEV.
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WELL #2	4918.0'
WELL #3	4858.0'
WELL #4	4990.0'
WELL #5	4996.5'
WELL #6	4932.0'
NEW WELL #7	**5304.0'**
MIDDLE FORK BPS	5051.1'
SAGEWOOD BPS	5064.1'
NEW TANK 1 BPS	**5149.0'**
TANK 1 GROUND	5149.1'
TANK 1 OVERFLOW	5165.1'
TANK 2 GROUND	5355.3'
TANK 2 OVERFLOW	5375.3'
NEW TANK 3 GROUND	**5635.0'**
NEW TANK 3 OVERFLOW	**5655.0'**
NEW BIG BEND BPS	**5287.0'**
ZONE 1 / ZONE 2 BOUNDARY	5075.0' - 5150.0' (Used 5110' in calculations)
ZONE 2 / ZONE 3 BOUNDARY	5275.0' - 5315.0' (Used 5290' in calculations)
ZONE 3 / ZONE 4 BOUNDARY	5435.0'

PROPOSED SYSTEM
ALTERNATIVE #11
COMORE LOMA
FIGURE 9

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Table 14 – Alternative 11 Estimate of Probable Cost

Item No.	Item	Estimated Cost
1	Replace Broken Distribution System Valves and add 24 Fire Hydrants (see Table 9)	$163,400
2	Add Flow Meters to Existing Pump Stations (See Subsection 5.5.2)	$42,000
3	Replace Well #1 with New Well Capable of Producing 1,667 gpm	$250,000
4	Well House for Well #1 with Vertical Turbine Pump, no Generator (See Appendix F)	$432,800
5	Booster Station at Tank 1 and Three Phase Power to Site Capable of 1,725 gpm without Generator (See Appendix F)	$492,200
6	New 422,000 Gallon Storage Tank for Zone 1 (See Appendix F)	$395,400
7	Additional Bolted Steel Tank at Tank 2 Site Holding 342,000 Gallons (See Appendix F)	$344,600
8	Upgrade Tank 2 Booster Pump Station to (3) 40 Hp Pumps	$110,000
9	Loop Zone 3 with 8 inch Pipe (See Appendix F)	$50,700
10	Portable Trailer-mount 300 KW Generator Primarily for Tank 2 BPS and Manual Switch Gear for one Well, Tank 1 BPS and Tank 2 BPS	$150,000
11	Water Meters at each Residence (see Table 10)	$617,800
12	SCADA Improvements for Water Meters in Well Houses and Programming for Flow Data Trend Lines, Pump Operating Hours and Cumulative Reports	$15,000
Total Construction & Engineering		**$3,063,900**
Administration, Legal and Interest Costs (4% of total above)		**$123,000**
Total Estimated Project Cost		**$3,186,900**

This alternative also includes the same pump station flow metering, telemetry, distribution system and Zone 3 looping improvements as Alt's. 8 and 10. Fixed emergency generators are not included because of having adequate storage for fires in each tank. One portable generator is included to support the Tank 2 booster pump station to ensure that water is always available under any circumstances anywhere in the system. This alternative still requires significant investment in new infrastructure and will be given further consideration later on.

5.5.6 Water Supply Improvement Alternative 12

Alternative 12 is similar to Alt. 11 except that no equalization storage will be included. Thus, more investment into wells and generators are required compared to Alt. 11. A schematic of this alternative is given on Figure 10.

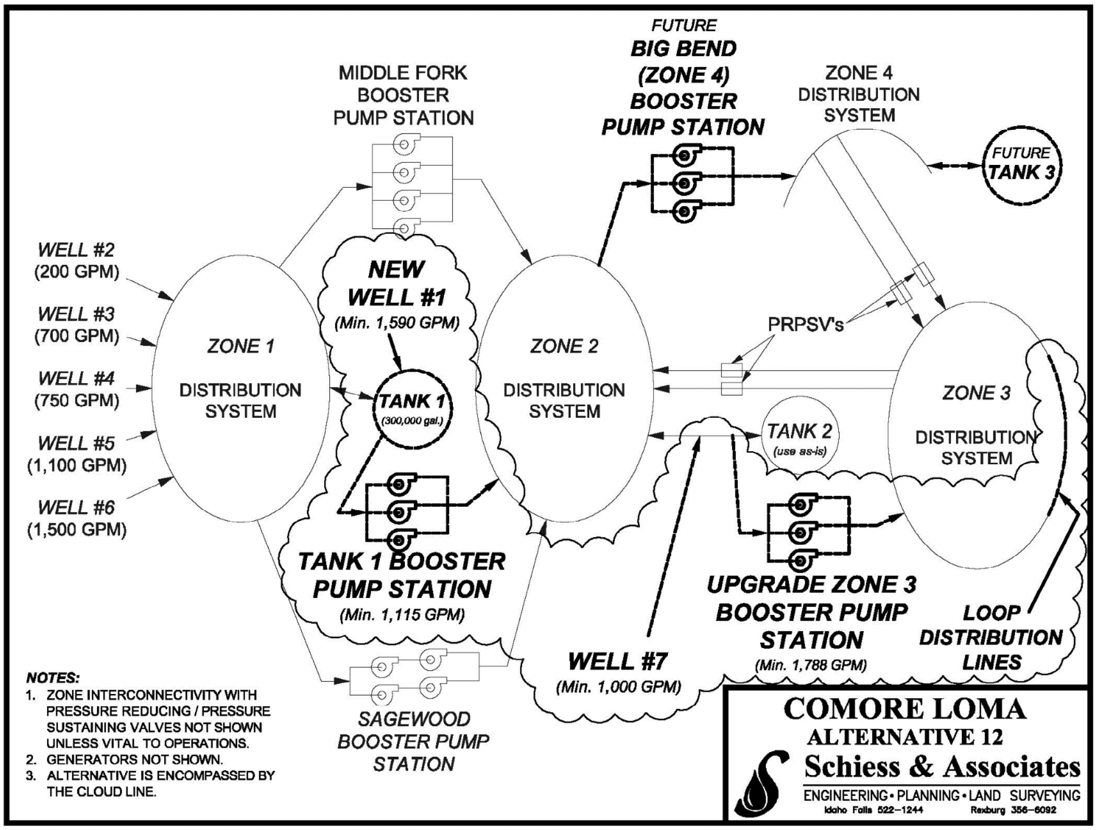


Figure 10 – Alternative 12 Schematic

The estimated capital costs of this alternative are given on Table 15.

Table 15 – Alternative 12 Estimate of Probable Cost

Item No.	Item	Estimated Cost
1	Replace Broken Distribution System Valves and add 24 Fire Hydrants (see Table 9)	$163,400
2	Add Flow Meters to Existing Pump Stations (See Subsection 5.5.2)	$42,000
3	Replace Well #1 with New Well Capable of Producing 1,590 gpm	$250,000
4	Well House for Well #1 with Vertical Turbine Pump and Diesel Generator	$571,800
5	Drill New Well #7 Capable of Producing 1,000 gpm	$225,000
6	Well House and Vertical Turbine Pump for New Well #7 (See Appendix F)	$373,000
7	Booster Station at Tank 1 Including Diesel Generator and Three Phase Power to Site Capable of 1,215 gpm	$539,700
8	New 300,000 Gallon Storage Tank for Zone 1	$306,000
9	Upgrade Tank 2 Booster Pump Station to (3) 40 Hp Pumps Including 80 KW Fixed Diesel Generator	$170,000
10	Loop Zone 3 with 8 inch Pipe	$50,700
11	Water Meters at each Residence (see Table 10)	$617,800
12	SCADA Improvements for Water Meters in Well Houses and Programming for Flow Data Trend Lines, Pump Operating Hours and Cumulative Reports	$15,000
Total Construction & Engineering		**$3,324,400**
Administration, Legal and Interest Costs (4% of total above)		**$133,000**
Total Estimated Project Cost		**$3,457,400**

This alternative also includes the same pump station flow metering, telemetry, distribution system and Zone 3 looping improvements as Alt.'s 8, 10 and 11. Fixed emergency generators were included on one well, one booster pump station and the Tank 2 booster pump station to ensure that water is always available under any circumstances and to compensate for the lack of fire flow storage in existing Tank 2. This alternative still requires significant investment in new infrastructure, but is reasonable enough to be considered further later on.

5.5.7 Water Supply Improvement Alternative 13

Upon completing the draft study in August 2013, and receiving technical approval of the document from DEQ (see approval letter dated September 17, 2013 in Appendix G), the Water Corporation board began to ponder on how to proceed. From August to December 2013 over the course of several meetings, the board decided to present to the system patrons an alternative developed by them. The engineer and DEQ attended one board meeting on October 24, 2013 wherein the entire study was reviewed by the engineer and discussed. The DEQ representative explained the conditions and terms of the SRF loan program. Any questions were asked and fielded by both the engineer and the DEQ representative.

After several meetings held by the board, one specifically on December 12, 2013, the board elected to present to the system patrons "Alternative D" which is given in this study as Alt. 13. The engineer met with the DEQ engineer with the purpose of seeing whether Alt. 13 would be sanctioned by DEQ. The DEQ engineer suggested this report be revised with Alternative 13 included and resubmitted for consideration of technical approval. This alternative is now discussed in detail. Figure 11 is a schematic of this alternative. Figure 12 identifies the improvement elements of this alternative.

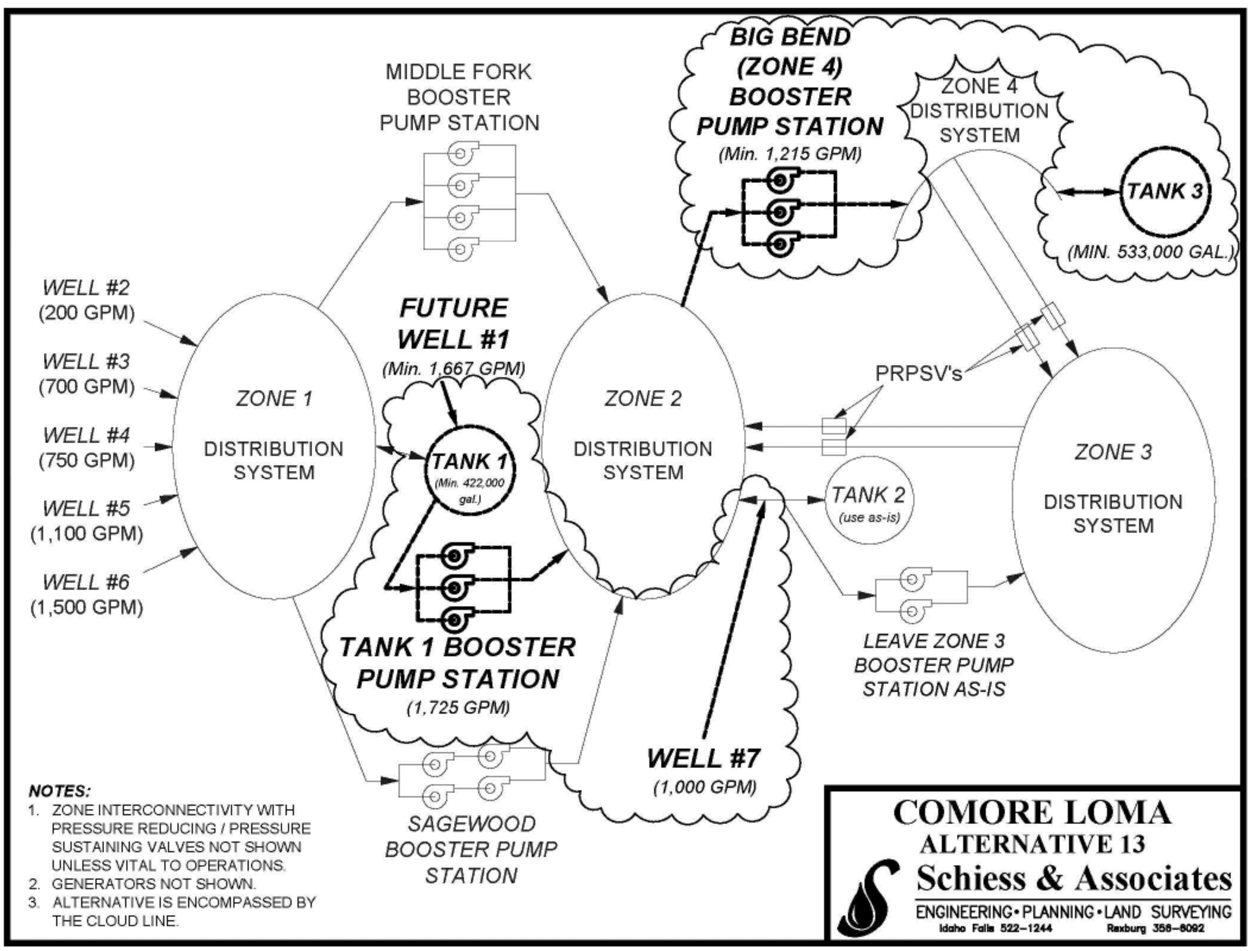
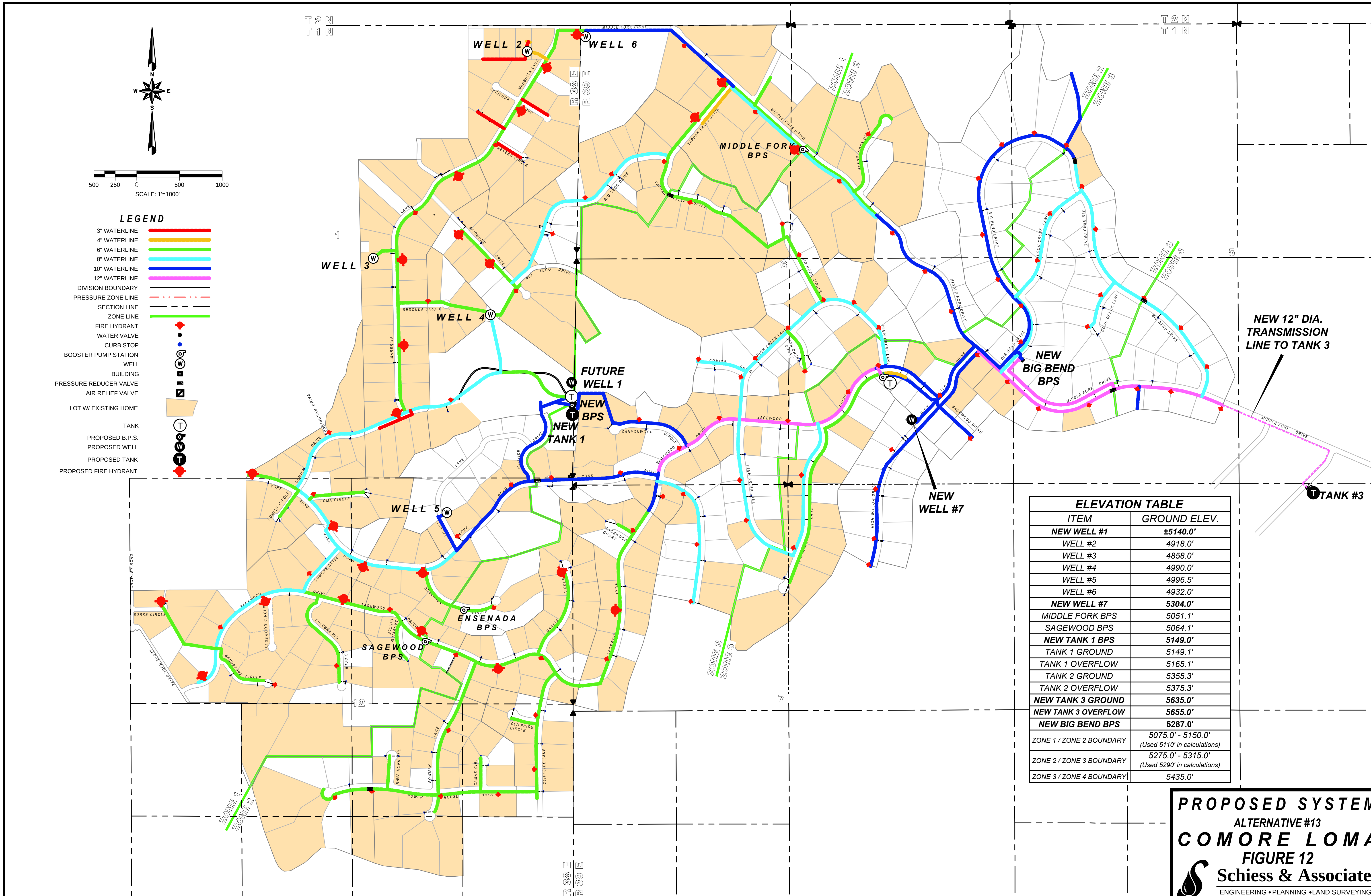


Figure 11 – Alternative 13 Schematic

This alternative includes construction of new Well 7, but not Well 1. This allows well water to be directly pumped into Zone 2 and Tank 2 from a well. Tank 3 would be built in lieu of a second tank at Tank 2. Big Bend BPS would be completed in lieu of upsizing and improving the capacity of Tank 2 BPS. This negates the need to loop the Zone 3 piping in Div. 25 as recommended for Alt.'s 8, 10, 11 and 12. Like all of these alternatives, all other miscellaneous improvements elements are included. Like Alt. 11, one portable generator for the entire system is included. This scope of work and associated cost is given on Table 16.



ELEVATION TABLE

ITEM	GROUND ELEV.
NEW WELL #1	**±5140.0'**
WELL #2	4918.0'
WELL #3	4858.0'
WELL #4	4990.0'
WELL #5	4996.5'
WELL #6	4932.0'
NEW WELL #7	**5304.0'**
MIDDLE FORK BPS	5051.1'
SAGEWOOD BPS	5064.1'
NEW TANK 1 BPS	**5149.0'**
TANK 1 GROUND	5149.1'
TANK 1 OVERFLOW	5165.1'
TANK 2 GROUND	5355.3'
TANK 2 OVERFLOW	5375.3'
NEW TANK 3 GROUND	**5635.0'**
NEW TANK 3 OVERFLOW	**5655.0'**
NEW BIG BEND BPS	**5287.0'**
ZONE 1 / ZONE 2 BOUNDARY	5075.0' - 5150.0' (Used 5110' in calculations)
ZONE 2 / ZONE 3 BOUNDARY	5275.0' - 5315.0' (Used 5290' in calculations)
ZONE 3 / ZONE 4 BOUNDARY	5435.0'

PROPOSED SYSTEM

ALTERNATIVE #13

COMORE LOMA

FIGURE 12

Schiess & Associates
ENGINEERING • PLANNING • LAND SURVEYING
Phone: (208) 522-1244 Fax: (208) 522-9232

Table 16 – Alternative 13 Estimate of Probable Cost

Item No.	Item	Estimated Cost
1	Replace Broken Distribution System Valves and add 24 Fire Hydrants (see Table 9)	$163,400
2	Add Flow Meters to Existing Pump Stations (See Subsection 5.5.2)	$42,000
3	Drill New Well #7 Capable of Producing 1,000 gpm	$225,000
4	Well House and Vertical Turbine Pump for New Well #7 (See Appendix F)	$373,000
5	Booster Station at Tank 1 and Three Phase Power to Site Capable of 1,725 gpm without Generator (See Appendix F)	$492,200
6	New 422,000 Gallon Storage Tank for Zone 1 (See Appendix F)	$395,400
7	Tank 3 Bolted Steel Tank Holding 533,000 Gallons (See Appendix F)	$470,200
8	Finish Big Bend Booster Pump Station with (3) 60 Hp Pumps	$314,000
9	Install Transmission Pipe from Zone 4 to Tank 3 (See Appendix F)	$124,000
10	Portable Trailer-mount 300 KW Generator and Manual Switch Gear for one Well, Tank 1 BPS and Big Bend BPS	$150,000
11	Water Meters at each Residence (see Table 10)	$617,800
12	SCADA Improvements for Water Meters in Well Houses and Programming for Flow Data Trend Lines, Pump Operating Hours and Cumulative Reports	$15,000
Total Construction & Engineering		**$3,382,000**
Administration, Legal and Interest Costs (4% of total above)		**$135,000**
Total Estimated Project Cost		**$3,517,000**

Unlike the other alternatives, Alt. 13 requires the Corporation to modify the current bylaws and developer agreement and take upon themselves the construction of all new water supply facilities instead of the developers doing the portion of work attributable to them then turning the facilities over to the Corporation for operation. This idea was not originally contemplated in the earlier document technically approved by DEQ because of the need to make this major policy change. These documents in their current form are given in Appendix G.

If this alternative was selected without the water meters, the total estimated project cost would be reduced to $2,875,200.

5.5.8 Comparison of Alternatives 10, 11, 12 & 13

Figure 5 was given earlier in this report to visually see in plan view the additional infrastructure contemplated with all of these alternatives. Figures 9 and 12 are representations of Alt. 11 and Alt. 13 respectively. When the word “future” is used on the schematic drawings and the overall system drawings, that element is not contemplated in that alternative.

This subsection compares these alternatives considering operations & maintenance, land requirements, construction problems, environmental impacts and discusses advantages and disadvantages.

Annual Operations and Maintenance

Table 17 compares projected O&M costs for each alternative discussed in this chapter. These costs represent the additional costs associated with the improvements made with each alternative. Many assumptions were made regarding the use of power from new facilities to develop these estimates. We expect that if Well 7 is constructed it will be used significantly due to its ability to direct pump into Zone 2. The new booster pump station at Tank 1 will also be relied upon heavily and become the primary booster pump station of the system.

Table 17 – Projected O&M Costs of each Alternative

Item No.	Expenditures	Alt. 10	Alt. 11	Alt. 12	Alt. 13	Comment
1	Power for new Well #1	$30,200	$40,400	$36,100	$0	Assume pump runs May to Oct. avg 40% of the time for Alt. 10 & 12, 50% of the time for Alt. 11
2	Power for new Well #7	$14,900	---	$14,900	$34,000	Assume pump runs 4 months 1/2 of the time for Alt. 10, 1/3 of time for Alt 12, 6 months 3/4 time for Alt. 13
3	Power for new Well #8	$13,300	---	---	---	Assume pump runs 4 months 1/4 of the time
4	Power for new Tank 1 BPS	$24,200	$21,300	$17,300	$14,400	Assume one pump runs year round, two pumps operate six months, each pump runs 1/2 time for Alts 10-12, 1/3 time for Alt. 13
5	Power for upgraded Tank 2 BPS	$10,800	$10,800	$10,800	$3,100	Assume on average one pump runs at half speed. For Alt. 13, no pump upgrade but run less for now to move water through Tank 3 until there are many more homes in Zone 3
6	Power for Big Bend BPS	$0	$0	$0	$24,500	Assume on average one pump runs all of the time
7	Generator maintenance (labor, fuel, service)	$6,000	$2,000	$6,000	$2,000	$2,000 per new generator
8	Labor for new wells and BPS's	$7,600	$3,800	$5,700	$5,700	$1,900 per new station
9	Water testing	$1,800	$600	$1,200	$600	$600 per new well
10	SCADA maintenance	$200	$100	$200	$400	$100 per new station
11	Landscaping	$1,500	$1,500	$1,500	$3,000	$1,500 per new station for visible facilities (Well 7 and Big Bend BPS)
Total O&M Costs		**$110,500**	**$80,500**	**$93,700**	**$87,700**	

Alternative’s 10 and 12 will have three generators to maintain as opposed to one for Alternative’s 11 and 13. An estimate of $2,000 was applied for each generator for annual maintenance and fuel.

Water testing will increase proportionately more for each alternative according to the number of new wells. Thus Alt. 10 has three new wells, Alt. 11 has one, Alt. 12 has two and Alt. 13 has one.

We expect that Well 7 and Big Bend BPS will require additional landscaping. SCADA maintenance will also be higher for those alternatives with more links.

Alternative 11 has the lowest projected overall costs due mainly to reduction of power demand charges, labor costs and generator maintenance costs during the summer because of using fewer wells and pumping less water than Alt. 10. Alternative's 11, 12 and 13 will all supply the same amount of water. There may be opportunity to cut power costs associated with Alt. 11 a small percentage by filling the storage tanks at power company off-peak hours during the summer as often as possible. By definition, this is not possible on the max day of the year as it is assumed that all pumps run all of the time on that day except for the redundant pumps. This potential savings was not accounted for in the table. Alt. 12 should be more costly than Alt. 11 because of the need to run pumps longer and may operate less efficiently than Alt. 11. Alt. 13 will have higher power costs than Alt. 11 because of the need to pump water for Zone 3 to Zone 4 and Tank 3 and then feed Zone 3 through PRPSV's from Zone 4.

Environmental Impacts
The items below were part of the review:

- All proposed Tank 1 site improvements including replacement of existing Tank 1 with a much larger tank and a new BPS.
- Hydrants along existing waterlines in roadways which have already been disturbed for installation of the water mainline.
- The BPS site for an upgraded Zone 3 booster pump station is already built whether the Big Bend site is converted for use or whether the existing BPS by Tank 2 is rehabilitated.
- Well 7. A test well for Well 7 has already been drilled and is currently capped and awaiting completion of the production well. The test well was drilled in 2007 at developer expense. This is a platted well site and the site has already been disturbed.
- The Tank 3 site and transmission line alignment will also be included.
- The power transmission line from Well 4 to Tank 1 BPS.

There appears to be little to no threat of surface water influence to future construction in the area around existing Tank 1 where the proposed larger tank and new booster pump station would be built. Each well has been established and placed into service in accordance with DEQ requirements. Ground water levels are no closer to the surface than 175 feet below ground surface according to well drilling logs of the existing production wells.

The character of the soil through which water mains are to be laid is typical loess for the eastern hillsides of the Snake River plain in Bannock, Bingham, Bonneville, Jefferson and Madison Counties. The USDA soil survey for Bonneville County classifies the soil as Potell silt loam. The soil depth can exceed 60 inches. Occasional shallow lava rock may also be found. The soil is moderately alkaline and is subject to piping. Erosion hazard is high. Any foundation design constructed in this area should follow at a minimum the local building code. For the booster pump station, building code minimum requirements for bearing capacity should be adequate.

Land Requirements
It has been reported to us that land ownership of the Tank 1 site will be required to be transferred to the Water Corporation before improvements begin. The system owns the land where Well 7 will be drilled. The property where Tank 3 and the associated transmission line to it would have to be temporarily or initially put under easement from the landowner until the area is platted and the location of the facilities are put under permanent ownership of the Corporation or in road right-of-way. Remaining improvements will be in existing road right of ways.

Construction Problems
There are always many unknowns with constructing wells. Certainly more risk is associated with Alt. 10 since it requires the construction of three wells compared to Alt. 11 and Alt. 13 (one well) and Alt. 12 (two wells). The well water from Well 5 is warmer than the other wells. There is a significant risk that warm or hot water could be found when drilling either Well 7 or Well 1. Water quality, although adequate in existing wells, is not as desirable compared to those wells west of Comore Loma that are drilled into the Snake Plain aquifer.

No other significant construction risk elements are apparent at this time.

Advantages/Disadvantages
Alternative 11 doesn't require generators at Tank 1 BPS and on a well. It is easier to operate a system with fewer wells and larger storage tanks than drill more wells, use smaller storage tanks and run more generators during a loss of grid power. The risk of success is higher for Alt. 11 and Alt. 13 than the other two alternatives.

Alt's. 11 and 13 include a large portable generator to run any well or booster pump station. There is no significant advantage to having a fixed generator on a well and booster pump stations when storage tanks in the system are properly sized with operational, standby, dead, fire and equalization storage. With all alternatives, the water system remains able to have drinking water inside their homes even during an extended period of the loss of power.

If the system will commit to constructing equalization storage, the practice of using fire flow storage and standby storage as equalization storage will stop. Using fire flow storage as equalization storage is an unwise and unsafe practice and should be stopped. Alternate's 11 and 13 would enable the water system to do this.

There is considerable risk associated with Alt. 10 in regard to whether the system can actually lower its peak hourly flow and max day flow per user 20 percent while continuing to use the same amount of water. Our experience is that this will not work and is not a good plan. If this philosophy is implemented but practically is proven impossible due to a lack of discipline on the part of the users then the Corporation would necessarily return to the plan of providing more wells and booster pumps stations as indicated by Alternative 8 and the facilities outlined on Table 12. This will surely put a heavier cost burden on the users than that of Alternative's 11, 12 and 13 that encourage conservation with the use of water meters.

The down side to Alternative 13 is that by including Well 7 instead of Well 1, less water supply by an estimated 667 gallons will be developed at this time. This simply means that in future capital planning (assuming Alt. 13 was constructed and built), the next well planned for the system will have to be constructed sooner. For example in 10 years as opposed to say 15 years. Another downside is that in constructing Tank 1 BPS, the entire capacity won't be needed right away. So it could be said that this BPS will initially be over-built. It will also provide excess capacity of the booster pumping stations beyond the build-out condition of the system by approximately 1,000 gpm. We believe it is in the best interest of the Corporation to construct this BPS to capacity now even though it will not be needed even for build-out of the system. The new BPS will be the primary BPS in the system. Middle Fork BPS and Sagewood will become Secondary BPS Systems.

The advantages to this alternative include the ability to construct facilities now that allow build out of Zone 4 in Div. 25, the opportunity to construct now Tank 3 and finish Big Bend BPS and the ability to leave Tank 2 and Tank 2 BPS alone and use them as is.

5.5.9 Conclusion

From the analysis conducted in this chapter of the various alternatives, we carry forward into the next chapter Alternatives 10, 11, 12, and 13 for further review and analysis.

6.0 SELECTION OF AN ALTERNATIVE

6.1 Present Worth (Life Cycle) Analysis

We conducted a present worth analysis to compare Alternative's 10, 11, 12 and 13. The additional costs expected with each project were used as the O&M cost for each alternative. We used the Real Discount Rate of 1.7 percent as prescribed by USDA-RD, which is taken from OMB Circular No. A-94, Appendix C. A copy of this circular appendix item is given in Appendix G of this report. We also calculated the results using a 3.5 percent rate. A 20 year period was used. The results of this comparison are given on Table 18.

Table 18 – Present Worth Comparison of Alternative's 10, 11, 12 and 13

Alternative	Capital Cost	Annual O&M Cost of New Facilities	Present Worth @ 1.7%	Present Worth @ 3.5%
Alt. 10	$3,457,400	$110,500	$5,317,653	$5,027,871
Alt. 11	$3,186,900	$80,500	$4,542,107	$4,330,998
Alt. 12	$3,328,800	$93,700	$4,906,227	$4,660,502
Alt. 13	$3,517,000	$87,700	$4,993,418	$4,763,428

This analysis provides some insight into which alternative is least desirable. Alt. 11 has the lowest projected capital cost. Alt. 13 has the highest projected capital cost. There is only $330,000 maximum cost difference between all alternatives. Based on capital cost alone no alternative can be dismissed.

The O&M costs to implement each alternative will trend as indicated with Alt. 11 having the least O&M cost, followed by Alt. 13, followed by Alt. 12 and last of all Alt. 10. Alt. 13 takes second place here because of having fewer pump stations than Alternative's 10 and having less generator maintenance than Alt. 12. Power costs with Alt. 12 and 13 should be similar.

Over a 20 year period, Alt. 10 has the highest present worth due to the need to maintain more pump stations and pump more water than the other alternatives. It is on these grounds that Alternate 10 is removed from further consideration. By eliminating Alt. 10 from consideration, the Corporation's water supply and demand philosophy must be to reduce water use to an average peak demand of 10 gpm/user. This must be adopted by the Corporation and successfully embraced by the water system users. The remaining Alternatives 11-13 all require a peak average demand of 10 gpm/user to be successfully implemented.

This exercise illustrates that over time Alt. 11 has a lower present worth by a gaining margin. Alt. 12, when compared against Alt. 11, provides for the same needs, but is inferior in both capital cost and O&M cost as shown with the present worth numbers in Table 18. Operationally, it will be far easier to maintain large storage tanks than additional moving parts in the form of more wells, booster pumps, VFD's, building louvers and fans and emergency generators. For these reasons, Alt. 12 is eliminated from further review.

Even though Alt. 13 has the highest capital cost, it has the third lowest present worth cost because of its second place position of the annual O&M cost. Alternative 13, although higher in cost, both capital and O&M, compared to Alt. 11 and Alt. 12, remains a desirable option because of non-monetary factors. For this reason, Alt. 11 and Alt. 13 will be evaluated against each other using non-monetary factors in the following section.

6.2 Non-Monetary Factors

Non-monetary factors should be considered to determine whether the Corporation should select Alt. 11 or Alt. 13. Alternative 11 is clearly the low cost alternative as discussed in the previous section. It provides for more water supply (the construction of Well 1 instead of Well 7) and will utilize the entire capacity of new Tank 1 BPS at build-out. However, it does nothing for the Zone 4 empty lots as the construction of Big Bend BPS and Tank 3 would do as part of Alt. 13. Alt. 13 will use less than half of the built capacity of the new Tank 1 BPS because of the construction of Well 7 in lieu of new Well 1.

Alt. 11 also would enlarge Tank 2 BPS. But long term, Tank 2 BPS, upgraded to 40 Hp pumps, would be more limited than if Tank 3 was constructed and Big Bend BPS was provided to fill the Tank with Alt. 13.

Perhaps the strongest argument for supporting Alt. 13 is the amount of infrastructure that is included. This alternative provides all needed long-term water supply needs in Zone's 3 and 4 for complete build-out of all vacant lots with the exception of well water supply by 667 gpm. Specifically, this applies to the Corporation taking on the remaining construction of Big Bend BPS and Tank 3. This action is possible if the Corporation makes policy changes to its Corporation bylaws and the developer agreement. If the Corporation takes this action, they will no longer rely on the developer for needed water supply facilities to serve approved lots. Approved lots would pay for the infrastructure more indirectly. The design of new supply facilities would be directed by the Water Corporation and not the developer. But the developer would remain responsible for his share of the costs of the new facilities.

For these reasons the engineer supports the Corporation board's desire to present Alt. 13 to the system patrons for consideration as the preferred alternative.

6.3 Evaluation of Final Public Input

Public input was gathered through a public involvement process and public meeting held on January 23, 2014. The advertisement documentation, comment sheets, sign-in sheet and meeting minutes are included in Chapter 8 of the Environmental Information Document given in its entirety in Appendix H of this study.

The public comment period extended through February 6, 2014. A ballot measure was called for on February 13, 2014. This measure offered Alternative 13 (Option C) with or without water meters, Alternative 11 (Option B) with or without water meters and a small project consisting only of replacement of Tank 1 with a larger tank and an adjacent booster pump station funded with cash or a loan. Alternative 13 garnished a large majority of the votes but the inclusion of water meters failed. Documentation of all of these actions are given in Appendix H in the EID.

6.4 Environmental Information Document

Immediately after the vote results were tabulated on February 13, 2014, an EID was prepared to determine any environmental effects and impacts that would be brought about as a result of implementation of Alternative 13 without water meters. This document was submitted to DEQ in late March 2014 and finalized in June of 2014. DEQ determined that the project would have no significant impact (FONSI) on the environment. DEQ invited public input on the FONSI with notice in the Post Register in June 2014. The results of the public input did not alter the findings of DEQ. The DEQ environmental determination and documentation of advertisement is also given in Appendix H.

7.0 PROPOSED PROJECT (RECOMMENDED ALTERNATIVE)

7.1 Selected Project

We originally recommended Alternative 11 as given on Table 14. After the Corporation Board completed their deliberations described in Subsection 5.5.7, they desired to seek implementation of Alternative 13. We reviewed their plan on its merits and see the benefits of it. We therefore support the Corporation Board's decision and would enjoy helping the Corporation Board along with their attorney in amending the Corporation Bylaws and Developer Agreement to enable the Corporation to implement Alt. 13. DEQ endorsed Alternative 13 in its January 16, 2014 approval letter given in Appendix G.

After completion of the public input process and environmental review process the alternative selected by the Water Corporation Board was Alternative 13 without water meters. Figure's 11 and 12 in Chapter 5 show most of the facilities to be constructed as part of this alternative.

7.2 Project Design

7.2.1 New Wells, BPS's and Storage Tanks

Figure 11 given in Chapter 5 is a schematic that represents the facilities that constitutes this project. Improvements are shown with bold line type. Those items indicated as future are not part of the project and would be constructed in the future when needed. **This project recommendation hinges upon average peak hourly flow consumption at each residence of 10 gpm (See Table 8).** The project elements in this chart are now discussed in detail.

1. Replace Tank 1 with a new minimum 422,000 gallon storage tank. This size of tank will ensure that operational storage, equalization storage, fire flow storage (1,500 gpm for two hours), standby storage and dead storage requirements will be met to perpetuity for Zone 1 as long as it is not expanded in size by additional development.

2. Construct a new booster pump station that will draw water out of the new Tank 1. The new BPS will supplement supply to Zones 2, 3 and 4 and help fill Tank 2. This booster pump station will become the primary booster pump station that moves water from Zone 1 to Zone 2. This pumping requirement should be met for some time even with additional development beyond Division 25 because Well 7 will be completed and pump directly into Zone 2.

   Although the full capacity will not be needed now, the new Tank 1 BPS should be designed for 1,725 gpm for a maximum line velocity of 7.1 fps. This results in 42 feet of headloss not counting the head losses developed by the booster pump station itself. Without BPS head losses, the TDH the pumps must overcome is a minimum of 234 feet (Tank 1 full and Tank 2 empty) and a maximum of 268 feet (Tank 1 empty and Tank 2 full). We recommend a booster pump configuration of (3) 75 Hp line shaft pumps, two to run in a lead-lag configuration and the third for redundancy. Line shaft pumps were used in the cost estimates as a lower maintenance cost alternative over time but at a higher capital cost than split-case type centrifugal pumps. Centrifugal pumps can function well and could also be considered for use as part of an alternative analysis in the preliminary design report completed as part of design.

3. Tank 2 will remain in the system and no other tank will be added to the site. This will require Tank 3 and Big Bend BPS to be completed now. The construction of Tank 3 will provide needed equalization storage as well as fire, operational and standby storage for Zone 3 and Zone 4.

4. The system needs an additional 1,667 gpm of well capacity to provide needed redundancy of well water supply. Alt. 13 only includes construction of Well 7, which will leave the Corporation short an estimated 667 gpm for build-out. The next well after Well 7 to be built, but not as part of this project would be Well 1 re-drilled close to Tank 1. It would be advisable to position Well 1, when built, close to Tank 1 to eliminate any risk of a new booster pump station at Tank 1 having more pumping capacity than what the Zone 1 distribution system can provide and deliver to Tank 1. A well next to Tank 1 will also ensure that Tank 1always operates within its design operating storage volume and maintains equalization storage, fire flow storage and standby storage when the new booster pump station is running.

5. With Alt. 13, there is no need to install new booster pumps in the Tank 2 BPS serving Zone 3. Zone 3 will be pressured by continuing to use the Tank 2 BPS as-is and by storage water in Tank 3 delivered to Zone 3 via Zone 4 through PRPSV's. Initially, this BPS will not be used much in order to maintain the water quality in Tank 3.

6. Construct Tank 3 to provide pressure to Zone 4 and to provide peak hour and fire flows to Zone 3 and Zone 4. This tank should now be constructed at 533,000 gallons. Since Zones 4, 3 and 2 are connected together in Division 25 with PRPSV's. Tank 3 will augment the shortage of fire flow storage and peak demand in Zone 3 not provided by the Tank 2 BPS. Since PSPRV's also connect Zone 3 and Zone 2, the fire flow shortage in Zone 2 can be provided from Tank 3. The unused capacity of overbuilt Tank 1 BPS could also help fire flows in Zone 2 in the short term.

7. Big Bend BPS will be constructed along with Tank 3 in order to fill Tank 3 and provide pressure and flow for Zone 4 and peak flow and fire supply for Zone 3. Normal Zone 3 demand will be satisfied with the existing Tank 2 BPS in the long term. In the short term this BPS will not be needed. Sizing the Big Bend BPS pumps to pump to Tank 3 with the reconfiguration of the system to keep Tank 2 BPS as-is was calculated at build out to be 1,215 gpm. The elevation head will be 300 feet (Tank 3 full – Tank 2 empty) or 260 feet (Tank 3 empty – Tank 2 full). With the head loss estimated at 25 feet, the TDH is expected to be a maximum of 325 feet. This will need to be verified during design. This should be accomplished with three 60 Hp booster pumps one of which is redundant to the other two. The building was designed for the use of centrifugal pumps as opposed to line shaft pumps.

8. We also recommend that the system purchase a trailer mount generator to pump water from at least one well and power booster pump stations. The new booster pump station near Tank 1, Big Bend Booster Pump Station, Well 2 and Well 6 are the logical pump stations to be fitted with manual transfer switches to accept the generator. This generator would lower the risk that the system would ever have a loss of pressure conditions and ensure that water is always available for in-home use as long as diesel fuel is available.

7.2.2 Site Evaluation of New Tank 1 and Tank 1 BPS

The site for replacement of Tank 1 and the proposed Tank 1 BPS is moderately sloping area located away from any homes. The property appears suitable in every way for a new tank and booster pump station. The tank property is also undergoing a process of deed transfer from the originator of the development to the association. At the time of construction the property should be formally deeded to the Water Corporation.

7.2.3 Well Lot and Location of Source

When the Water Corporation is ready to improve water supply by drilling Well 7, a drilling permit for the well will be required. There appears to be adequate water rights to allow for drilling this well. After the project is completed and the system grows, necessitating another well, we suggest the next well be drilled at the Tank 1 site (new Well 1). The lot will have to be of substantial size to house the storage tank, BPS and well and should be obtained with the plan of incorporating a future replacement well for existing Well 1.

Storage tank design will dictate the type of tank foundation that will be required. The expected foundation design for a low profile ground level bolted steel tank is simply compacted crushed gravel fill base under the entire tank and spread footings to support interior posts or a concrete ring wall and concrete floor.

7.2.4 Treatment

No treatment is planned for this project.

7.2.5 Distribution System

Distribution system improvements are shown on Figure 12. We recommend additional fire hydrants in the older part of the system to be more in line with current Bonneville County spacing requirements of 500 feet apart. Twenty-four new fire hydrants are recommended. The project also consists of some valve replacement.

7.2.6 Water Meters

Water meters as described in Table 10 will be needed to regulate water usage in order to realize a 17.9 percent water reduction (average) in each home. Without water meters, we do not believe the system could reduce collective consumption of water per home 17.9 percent annually. This may also need to include incentives for lawn size reduction, water conservation training and adjusted water rate schedules.

At this point, the Corporation is not sure whether water meters will be part of the project. They are shown in the cost estimate but may be removed and not constructed.

7.3 Total Project Cost Estimate

The estimate of cost for this project is that given on Table 19.

Table 19 – Alternative 13 Estimate of Probable Cost (Without Water Meters)

Item No.	Item	Estimated Cost
1	Replace Broken Distribution System Valves and add 24 Fire Hydrants (see Table 9)	$163,400
2	Add Flow Meters to Existing Pump Stations (See Subsection 5.5.2)	$42,000
3	Drill New Well #7 Capable of Producing 1,000 gpm	$225,000
4	Well House and Vertical Turbine Pump for New Well #7 (See Appendix F)	$373,000
5	Booster Station at Tank 1 and Three Phase Power to Site Capable of 1,725 gpm without Generator (See Appendix F)	$492,200
6	New 422,000 Gallon Storage Tank for Zone 1 (See Appendix F)	$395,400
7	Tank 3 Bolted Steel Tank Holding 533,000 Gallons (See Appendix F)	$470,200
8	Finish Big Bend Booster Pump Station with (3) 60 Hp Pumps	$314,000
9	Install Transmission Pipe from Zone 4 to Tank 3 (See Appendix F)	$124,000
10	Portable Trailer-mount 300 KW Generator and manual switch gear primarily for on Well, Tank 1 BPS and Big Bend BPS	$150,000
11	Water Meters at each Residence (see Table 10)	$0
12	SCADA Improvements for Water Meters in Well Houses and Programming for Flow Data Trend Lines, Pump Operating Hours and Cumulative Reports	$15,000
Total Construction		**$2,764,200**
Administration, Legal and Interest Costs (4% of total above)		**$111,000**
Total Estimated Project Cost		**$2,875,200**

7.4 Annual Operating Budget & Capability of Finance & Management

We now calculate the impacts that Alternative 13 (without water meters) is expected to have on the quarterly rate of each user of the system. The assumptions that go into the calculations are made first followed by the rate determination.

7.4.1 Debt Service Reserve

A debt service reserve of 10 percent of the loan is typically required by funding agencies.

7.4.2 Short Lived Assets Reserve

We calculated the short-lived assets for Alternative 13. These are given on Table 20.

Replacement costs are a percentage of new installation cost and considerations of high cost replacement options such as VFD’s, bearings, sensors and motors. We expect the short lived assets replacement reserve to cost approximately $22,000 annually. This amounts to approximately $17 per user per quarter or $67 per year per connection based on 320 users.

Table 20 – Short-lived Assets of Selected Project

Item. No.	Item	Total	Replace-ment Year	Cost/yr	Comments
1	New Well #1 VFD & panel	$45,000	15	na	Discount Alt. 10 due to smaller motor
2	Well #2 submersible pump & motor 40 Hp	$14,000	10	$1,400	new pump 2004, 1996
3	Well #2 controls	$1,600	15	$107	
4	Well #3 submersible pump & motor, 125 Hp	$21,200	10	$2,120	
5	Well #3 controls	$5,000	15	$333	
6	Well #4 submersible pump & motor, 125 Hp	$21,200	10	$2,120	
7	Well #4 controls	$5,000	15	$333	
8	Well #5 VFD & panel	$35,000	15	$2,333	
9	Well #6 VFD & panel	$35,000	12	$2,917	Replaced in 2011 due to lighting strike
10	New Well #7 VFD & panel	$30,000	15	$2,000	
11	Middle Fork BPS, (4) 30 Hp motors & soft starts & controls	$18,000	15	$1,200	Bearings @ $1,500 each
12	Big Bend BPS, (3) 60 Hp motors and soft starts	$24,000	15	$1,600	Bearings @ $2,000 each
13	Sagewood BPS (4) 7.5 Hp motors	$7,200	10	$720	
14	New Tank 1 BPS (3) 75 Hp motors, VFD's & panel	$32,500	15	$2,167	Discount Alt. 12 due to smaller pumps
15	Tank 2 BPS VFD's & panel	$4,200	10	$420	
16	SCADA system	$27,000	15	$1,800	9 links at $3,000/link
Totals		**$325,900**		**$21,570**	
No. of current users				**320**	
Amount per current user per year				**$67**	
Amount per current user per quarter				**$16.85**	

7.4.3 Expected O&M Costs

We estimated the cost for O&M going forward with Alternate 13 without water meters which comprises Table 21. Short-lived assets are a budgetary item in this estimate.

Table 21 – O&M Estimate of Cost with Selected Project

Item No.	Expenditures	Alt. 13 w/o Water Meters
1	Power	$188,790
2	Pump & line (not including short-lived asset replacement)	$50,000
3	Short-lived asset replacement	$21,600
4	Insurance	$2,000
5	Labor for new wells & BPS's	$5,700
6	Insurance	$3,000
7	Accountant & part-time management	$40,000
8	Water testing	$3,600
9	Phone	$1,700
10	Taxes	$300
11	Landscaping	$6,000
12	Office & post	$3,500
Total O&M Costs		**$326,190**

Compared to Table 4, we expect future costs to be less than the 2013 budget, but more than the current budget line item in Table 4. The new booster pump stations and Well 7 will allow Well 3 and Well 4 more rest and thus we expect less maintenance for these systems. New systems will be built using line-shaft type pumps except for Big Bend BPS which is already set up for using centrifugal pumps.

7.4.4 Debt Repayments and Estimated User Rates

For the final version of this document we show only a DEQ SRF loan program for funding. For FY 2014, DEQ invited Comore Loma to apply for a loan with terms of 1.25 percent interest rate and a 30 year loan period. Once the corporation was earmarked for an SRF loan and the terms of the loan were understood, the corporation prepared a loan application and submitted it on the same day as the draft environmental information document in late March 2014. Table 22 shows the expected rates with the DEQ loan forgiveness of a percentage of the loan. For this analysis we will estimate $240,000 of loan forgiveness. We included the short-lived assets reserve as part of the future O&M costs as shown on Table 21.

Table 22 – Preliminary Debt Repayments and Estimated User Rates

Item		Alt 13 w/o Meters	
Total estimated project capital cost		$2,875,200	
Contingency 6%		$174,800	
SRF loan forgiveness (estimated)		-$240,000	
SRF loan amount (1.25% for 30 years)		$2,810,000	
User Class	Home	Private Lots	Developer Lots
No. Units[1]	320	120	80
Annual debt service distribution per user class	$51,319	$19,245	$42,338
Estimated O&M cost with new project (including short-lived assets)	$326,190	$0	$0
Estimated annual debt reserve (10% of loan)	$5,132	$1,924	$4,234
Capital reserve for long term asset replacement @ $40/user/yr	$12,800	$0	$0
Total estimated annual costs	$395,441	$21,169	$46,572
Estimated quarterly O&M costs per user class (including short-lived assets)	$255	$0	$0
Estimated Loan payment figured quarterly per user class	$40	$40	$132
Estimated debt reserve figured quarterly per user class (10% of loan)	$4	$4	$13
Capital reserve for long term asset replacement per quarter per EDU	$10	$0	$0
Estimated quarterly rate per user class	**$309**	**$44**	**$146**
Estimated monthly rate per user class	**$103**	**$15**	**$49**

[1]Hydraulic calculations used a total of 534 lots. This analysis uses a total of 520 lots. These numbers were provided to the engineer.

Comore Loma will need $463,182 of revenue per year to implement this plan. With this plan now approved by the corporation board and affirmed by the vote of the people with the support of the proposed project, three user classes will pay for the loan: home lots, private lots without a home and developer owned lots without a home. The home lots will be solely responsible for payment of operations and maintenance. The funding plan of Table 22 reflects this plan. By spreading the costs of new infrastructure over three user classes, there should be minimal rate increases necessary to fund the loan and pay for operation and maintenance. This is explained in Chapter 1 of the Environmental Information Document in Appendix H. The expected amount of the new average quarterly rate for each user with all costs included is $309 as shown.

7.4.5 Income from Proposed Rate Schedule

Comore Loma raised the water rates for 2013. They are currently determining the area that each user irrigates to bring an added measure of fairness to the rate structure. The 2013 quarterly water rate schedule is given in Appendix D. The user irrigating a half acre or less will pay a minimum of $188 per quarter and the user irrigating 4.8 acres will pay $1,800 per quarter.

7.4.6 Owner Certification

Comore Loma Water Corporation has delivered water to its patrons since 1974. As stated in Section 1.3 of this report, the Corporation has operated and maintained the water system debt-free. Occasionally, special assessments and rate increases have been used to maintain needed operating capital. The Corporation is fully committed to providing quality drinking water to its patrons to perpetuity. With a 39 year history of debt free operations, the Corporation board is ready and committed to its fiduciary responsibilities which may include debt utilizing an SRF loan.

7.4.7 Operator Licensing

The current licensed operators of the system are Randy Skidmore and Dennis Bell. Their license documentation is given in Appendix G. The proposed project will not affect a change in system classification or licensing of the operators.

7.5 Funding Sources

7.5.1 USDA-RD Direct Loan & Grant Program

The United States Department of Agriculture-Rural Development direct loan and grant program provides loans for all qualifying water systems that meet loan criteria. The current market rate for these funds is 3.5 percent. Grants as high as 25 percent of the project costs may be awarded based on need. A 10 percent loan reserve held by the Corporation is also required. Application can be made anytime. Funding usually occurs December through August. These funds are reserved for communities under 10,000 people and are geared toward communities not meeting basic water supply needs. One requirement for these funds will be the installation of flow meters at every service connection. The Water Corporation and Schiess & Associates contacted USDA-RD and discovered that Comore Loma would not qualify for these funds.

7.5.2 USDA-RD Guaranteed Loan

Another loan opportunity from USDA-RD considered for the water corporation is the use of a guaranteed loan. This is a loan that the Corporation would secure with a local bank. This USDA-RD then becomes the guarantor of the loan up to 90 percent. The interest rate and terms of a guaranteed loan would be negotiated with the bank and be subject to the approval of USDA-RD. Water meters at every service connection are not required. Application can be made anytime. This is a feasible loan alternative. However, during the course of this study it was determined that the terms of this loan are unfavorable compared to the terms offered by the DEQ SRF loan program.

7.5.3 DEQ State Revolving Fund (SRF) Grants and Loans

DEQ also has grant and loan funds that the Corporation chose to pursue. With Comore Loma's letter of intent submitted to DEQ in January of 2013, DEQ ranked the Corporation sufficiently high enough to receive an opportunity funding.

Comore Loma has qualified for these funds with a rigorous facility planning effort and environmental review process meeting DEQ requirements. The loan application was submitted in late March of 2014.

7.6 Project Schedule

The Water Corporation has sought to fund all or most all of the project outlined in Section's 7.1 to 7.4 of this study. The loan application to DEQ for FY 2014 funding for the entire amount of the project as outlined on Table 19. Loan approval is pending but expected at the completion of this study. A schedule that illustrates the timing required by the Corporation to capture FY 2014 DEQ SRF loan funds and implement design and construction of the project is given on Table 23.

Table 23 – Implementation Schedule of FY 2014 SRF Loan

Item	Estimated Completion Date
Technical Approval of FPS from DEQ	August 2013, Revised January 2014
Public involvement process including advertisement, public comment period and public meeting	January – February
Project selection by the board	February
Begin environmental review	February
Initiate loan application	January 2014
Conclude environmental review	July
Loan application final submittal	June
Loan approval	June
Enter design contract with engineer	July
Begin design engineering	July
Submit preliminary engineering report to DEQ for approval	August
Address DEQ comments of preliminary engineering report, resubmit preliminary engineering report to DEQ and receive approval. Initiate final design.	September
Prepare draft bid documents, design plans & specifications and submit to DEQ for review	January 2015
Submit final bid documents, design plans & specifications and receive approval from DEQ	February
Advertise and open bids for project	March
Award project and begin construction	April
Substantial completion	October
Final inspection	November
O&M manual final preparation & project closeout	December

7.7 Environmental Mitigation

The completed Environmental Information Document given in Appendix H resulted in a FONSI. However, there are construction related mitigation requirements that must be included in construction documents and addressed during construction. These are given in Chapter 7 of the EID.

8.0 CONCLUSIONS AND RECOMMENDATIONS

We recommend Comore Loma implement the improvement projects comprising Alternative 13. This should provide adequate water for outside irrigation. Successful implementation will require strict adherence to policy on how and when water is used. Conservation measures will also be needed. Since the community elected to not include water meters in the loan, we must emphasize that for the water supply improvements recommended in this study to meet system needs at build-out the system must be managed to limit use to 10 gpm average consumer peak use.

Comore Loma Water Corporation is at a cross-roads. They are struggling with their current use pattern while trying to get developers to pay their fair share for the impacts on a system as the system continues to expand. This has been precariously done in the past with neither side possessing adequate supporting documentation of claims made about fairness. This study attempts to provide background documentation and to provide a factual basis to help the system grow in a fashion agreeable to both the Corporation and Developers while satisfying current rules and regulations promulgated by Idaho DEQ and Bonneville County. The funding plan set up as part of this project does this.

This study outlined water supply needs for actual water use conditions and for conditions that would be reasonable from a developer and corporation by-laws point of view all the way to the build-out condition. Tank 3 and Big Bend BPS are included in Alt. 13. This study provided the means to enable both the developer and the Water Corporation as represented by the corporation board to have thoughtful, fact-based discussions on how to satisfy the needs and wants of both parties. As the author of this study having a good understanding of water system rules and regulations as they apply to Comore Loma, it has been our pleasure to help determine a fair and long term solution as to who should pay for what in order to satisfy the needs and concerns of both parties.

We now summarize our recommendations and conclusions for improvements while considering a required 30 year system life.

1. Seek to capture SRF loan funds from DEQ in FY2014. These funds have a 0.5 percent better interest rate than the FY2015 earmark from DEQ. This report encompassed all of the DEQ facility planning requirements and USDA-RD preliminary engineering report requirements necessary to seek out and qualify for funding from both entities. DEQ prioritized Comore Loma for SRF funding with much better loan terms than USDA can provide with a guaranteed loan. For these reasons, it was determined that the Corporation should pursue loan funding from DEQ. The Corporation continued to pursue full facility plan approval through DEQ including the DEQ environmental review process. At the close of this study the SRF loan approval is pending and the EID review process is completed.
2. Even though water meters were not approved by the patrons for inclusion into the project, we still recommend the corporation board and voters keep meters as a long term goal. Meters should be installed as a management tool to manage water delivery and to conserve water. The target peak hour flow used in approved project was 10 gpm/user at peak hour and 8.3 gpm/user on the max day of the year. Meters will benefit the Corporation by

improving water use management in the system much more than can be obtained with policy management. Data gained from meters will help the Corporation keep the division between what facilities the Corporation and developer should be responsible for and enable the Corporation to allow necessary and predictable additions to the water supply system. If home owners desire a larger meter, we suggest that they be asked to pay the price difference out of pocket for the meter and be prepared to pay a larger water base rate compared with those who are willing to conserve. An equitable rate structure would have to be developed.

3. Plan for and construct facilities for a 30 year planning horizon because of the difficulty of making smaller incremental improvements. For instance, you cannot build half of a booster station for half of the cost. Because of fixed costs, it costs more to build in smaller increments. The same applies to new wells. Strike a long term written agreement acceptable to both the Corporation and Developer that will not require further negotiation of who should pay for what as the empty lots develop and new housing divisions are added beyond the infrastructure capacity included in this project.
4. As part of the loan process, all water rights and water right permits applicable to current well capacities and land holding Corporation facilities should be transferred or deeded to the Water Corporation. This is a requirement of any government sponsored loan.

Appendix A: Well, Well Pump, and Booster Pump Data

- Well Logs
- Well Pump Curves
- Booster Pump Curves
- Water Rights

USE TYPEWRITER OR BALL POINT PEN

Well #1
Out of Service

State of Idaho
Department of Water Resources

WELL DRILLER'S REPORT

State law requires that this report be filed with the Director, **Department of Water Resources within 30** days after the completion or abandonment of the well.

1. WELL OWNER

Name: Dick Skidmore Well No.1

Address: Route 3 Box 47A Idaho Falls, Idaho

Owner's Permit No. ______

2. NATURE OF WORK

☒ New well ☐ Deepened ☐ Replacement

☐ Abandoned (describe method of abandoning) ______

3. PROPOSED USE

☒ Domestic ☐ Irrigation ☐ Test ☐ Other (specify type)

☐ Municipal ☐ Industrial ☐ Stock ☐ Waste Disposal or Injection

4. METHOD DRILLED

☐ Cable ☒ Rotory ☐ Dug ☐ Other

5. WELL CONSTRUCTION

Diameter of hole 10 inches Total depth 450 feet

Casing schedule: ☒ Steel ☐ Concrete

Thickness	Diameter	From	To
.250 inches	6 inches	+1 feet	230 feet
inches	inches	feet	feet
inches	inches	feet	feet
inches	inches	feet	feet
inches	inches	feet	feet

Was casing drive shoe used? ☐ Yes ☐ No

Was a packer or seal used? ☐ Yes ☒ No

Perforated? ☐ Yes ☒ No

How perforated? ☐ Factory ☐ Knife ☐ Torch

Size of perforation ______ inches by ______ inches

Number		From	To
	perforations	feet	feet
	perforations	feet	feet
	perforations	feet	feet

Well screen installed? ☐ Yes ☒ No

Manufacturer's name ______

Type ______ Model No. ______

Diameter ___ Slot size ___ Set from ______ feet to ______ feet

Diameter ___ Slot size ___ Set from ______ feet to ______ feet

Gravel packed? ☐ Yes ☒ No Size of gravel ______

Placed from ______ feet to ______ feet

Surface seal depth 20 Material used in seal ☐ Cement grout

Bentonite ☐ Puddling clay ☐ Well cuttings

Sealing procedure used ☐ Slurry pit ☐ Temporary surface casing ☐ Overbore to seal depth

6. LOCATION OF WELL

Sketch map location must agree with written location.

N
W E
S

Subdivision Name ______

Lot No. ______ Block No. ______

County Bonneville

NE ¼ SW ¼ Sec. 1, T. 1 N N/S, R. 38 W E/W

7. WATER LEVEL

Static water level 370 feet below land surface

Flowing? ☐ Yes ☒ No G.P.M. flow ______

Temperature ______ °F. Quality Good

Artesian closed-in pressure ______ p.s.i.

Controlled by ☐ Valve ☐ Cap ☐ Plug

8. WELL TEST DATA

☐ Pump ☐ Bailer ☐ Other

Discharge G.P.M.	Draw Down	Hours Pumped

9. LITHOLOGIC LOG

Hole Diam.	Depth From	Depth To	Material	Water Yes	Water No
10	0	77	Brown Soil		
	77	213	Sandstone and Pumice		
	213	233	Brown Riolite		
	233	283	Hard Gray Chert Rock		
	283	310	Firm Brown Riolite		
	310	312	Broken Brown Riolite		
	312	323	Firm Gray Basalt		
	323	338	Black Sanstone		
	338	372	Brown Sandstone		
	372	448	Firm Pumice	x	
10	448	450	Black Sand	x	

10.

Work started Oct. 26, 1973 finished Oct. 31, 1973

11. DRILLERS CERTIFICATION

Firm Name Andrew Well Drilling Contr. Firm No. ______

Address 1268 East 17th Street, Idaho Falls, Idaho 83401 Date 1-30-75

Signed by (Firm Official) [illegible signature]

and

(Operator) [illegible signature]

USE ADDITIONAL SHEETS IF NECESSARY FORWARD THE WHITE COPY TO THE DEPARTMENT

USE TYPEWRITER OR BALL POINT PEN

State of Idaho
Department of Water Resources

Well #2

WELL DRILLER'S REPORT

RECEIVED
MAR 8 1977
Department of Water Resources
Eastern District Office

State law requires that this report be filed with the Director, Department of Water Resources within 30 days after the completion or abandonment of the well.

1. WELL OWNER

Name Dick Skidmore Well No. 2

Address Route 3 Box 47A Idaho Falls, Idaho

Owner's Permit No. ______

2. NATURE OF WORK

☒ New well ☐ Deepened ☐ Replacement

☐ Abandoned (describe method of abandoning)

3. PROPOSED USE

☒ Domestic ☐ Irrigation ☐ Test ☐ Other (specify type)

☐ Municipal ☐ Industrial ☐ Stock ☐ Waste Disposal or Injection

4. METHOD DRILLED

☐ Cable ☒ Rotory ☐ Dug ☐ Other

5. WELL CONSTRUCTION

Diameter of hole 10 inches Total depth 295 feet

Casing schedule: ☒ Steel ☐ Concrete

Thickness	Diameter	From	To
.250 inches	8 inches	+1 feet	198 feet
inches	inches	feet	feet
inches	inches	feet	feet
inches	inches	feet	feet
inches	inches	feet	feet

Was casing drive shoe used? ☒ Yes ☐ No

Was a packer or seal used? ☐ Yes ☒ No

Perforated? ☐ Yes ☒ No

How perforated? ☐ Factory ☐ Knife ☐ Torch

Size of perforation ______ inches by ______ inches

Number	From	To
perforations	feet	feet
perforations	feet	feet
perforations	feet	feet

Well screen installed? ☐ Yes ☒ No

Manufacturer's name ______

Type ______ Model No. ______

Diameter ___ Slot size ___ Set from ______ feet to ______ feet

Diameter ___ Slot size ___ Set from ______ feet to ______ feet

Gravel packed? ☐ Yes ☒ No Size of gravel ______

Placed from ______ feet to ______ feet

Surface seal depth 20 Material used in seal ☐ Cement grout

Bentonite ☒ Puddling clay ☐ Well cuttings

Sealing procedure used ☐ Slurry pit ☐ Temporary surface casing

☒ Overbore to seal depth

6. LOCATION OF WELL

Sketch map location must agree with written location.

25 8

N / W / E / S

Subdivision Name Comora Loma

Lot No. ______ Block No. ______

County Bonneville

NE ¼ NE ¼ Sec. 1, T. 1 N/S, R. 38 E/W

7. WATER LEVEL

Static water level 220 feet below land surface

Flowing? ☐ Yes ☒ No G.P.M. flow ______

Temperature ______ °F. Quality ______

Artesian closed-in pressure ______ p.s.i.

Controlled by ☐ Valve ☐ Cap ☐ Plug

5165
4918
247

8. WELL TEST DATA

☐ Pump ☐ Bailer ☐ Other

Discharge G.P.M.	Draw Down	Hours Pumped

220
247
467' @ 200 gpm

9. LITHOLOGIC LOG

Hole Diam.	Depth From	Depth To	Material	Water Yes	Water No
10	0	3	Topsoil		
	3	12	Broken Brown Riolite		
	12	40	Brown Sandstone		
	40	90	Sandstone and Pumice		
	90	183	Pumice		
	183	190	Brown Sandstone		
	190	200	Gray Sandstone		
	200	208	Brown Sandstone		
	208	210	Hard Chertrock		
	210	227	Hard Gray Chertrock		
	227	233	Broken Brown Riolite	x	
	233	243	Firm Brown Riolite		
	243	250	Broken Brown Riolite	x	
	250	270	Firm Brown Riolite		
	270	273	Broken Brown Riolite	x	
	273	285	Firm Brown Riolite		
10	285	295	Broken Brown Riolite	x	

003409

10.

Work started Nov. 1, 1973 finished Nov. 6, 1973

11. DRILLERS CERTIFICATION

Firm Name Andrew Well Drilling Cont. Firm No. 5

Address 1268 East 17th Street Date 1-30-75
Idaho Falls, Idaho 83401

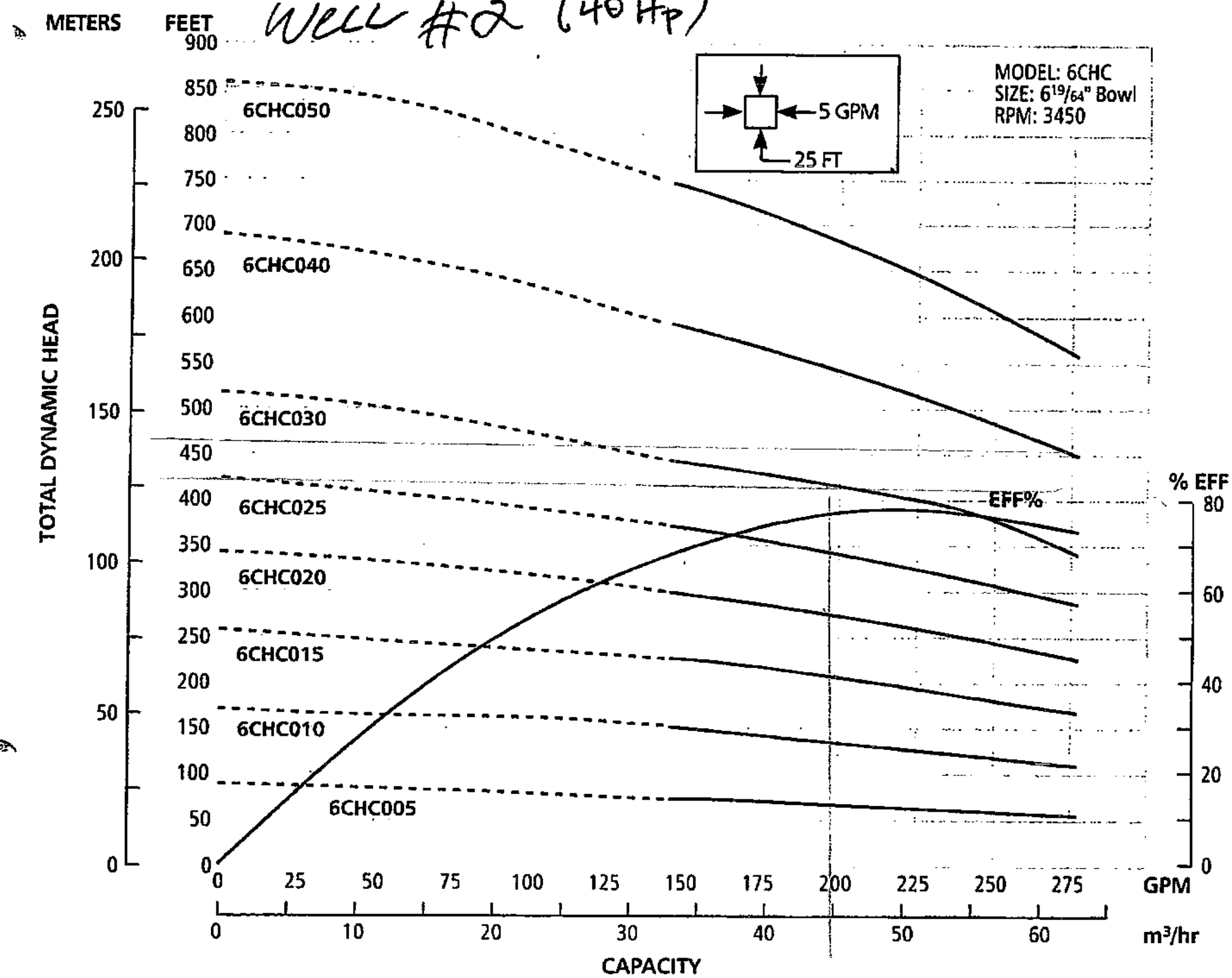
Signed by (Firm Official) Howard L. Andrews

and

(Operator) Dale Hulse

USE ADDITIONAL SHEETS IF NECESSARY FORWARD THE WHITE COPY TO THE DEPARTMENT

Well #2 (40 Hp)

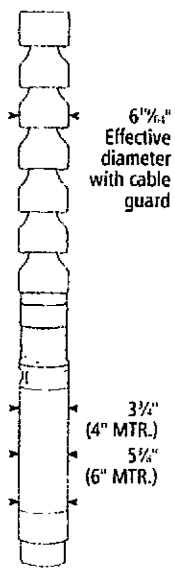


DIMENSIONS AND WEIGHTS

HP	Stages	W.E. Order Number	W.E. Length	W.E. Wt. (lbs.)
5	1	6CHC00544CTS	17$^{13}/_{64}$	50
		6CHC00564CTS	19$^{11}/_{32}$	55
10	2	6CHC01064CTS	24$^{19}/_{64}$	72
15	3	6CHC01564CTS	29$^{13}/_{64}$	89
20	4	6CHC02064CTS	34$^{51}/_{64}$	106
25	5	6CHC02564CTS	40	123
30	6	6CHC03064CTS	45	140
40	8	6CHC04064CTS	55$^{5}/_{16}$	174
50	10	6CHC05064CTS	65$^{13}/_{64}$	208

(All dimensions in inches and weights in lbs. Do not use for construction purposes.)

PLEASE NOTE:
- Order motors separately.
- For intermediate horsepower pumps consult factory.
- Solid line is recommended operating range. The dotted line (- - - -) signifies an alternate pump selection is available.
- Please specify all options changes in W.E. order number.



MATERIALS OF CONSTRUCTION

Part Name	Material
Shaft	ASTM A582 TYPE 416
Coupling	ASTM A582 S41600 CD
Suction Adapter	Ductile Iron ASTM A536
Discharge Bowl	ASTM A48 CL 30B
Rubber Bearings	RUBBER
Optional Bronze Bearings	ASTM B584
Discharge Bowl Bearing	ASTM B584
Taperlocks	ASTM A108 GR 1018
Bowl	ASTM A48 CL 30B
Upthrust Collar	Polyethylene
Impeller	ASTM B584
Fasteners	SAEJ429 GR 8
Cable Guard	ASTM A240 S 30400
Suction Strainer	ASTM A240 S 30400

Well #3

Form 238-7
1/78

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

USE TYPEWRITER OR BALLPOINT PEN

WELL DRILLER'S REPORT

State law requires that this report be filed with the Director, Department of Water Resources within 30 days after the completion or abandonment of the well.

RECEIVED DEC 31 1979

1. WELL OWNER

Well # 3

Name Dick Skidmore Comore Loma

Address Rt. 7 Box 33 Idaho Falls, Ida. 83401

Owner's Permit No. ______

2. NATURE OF WORK

☒ New well ☐ Deepened ☐ Replacement
☐ Abandoned (describe method of abandoning) ______

3. PROPOSED USE

☒ Domestic ☐ Irrigation ☐ Test ☐ Municipal
☐ Industrial ☐ Stock ☐ Waste Disposal or Injection
☐ Other ______ (specify type)

4. METHOD DRILLED

☒ Rotary ☐ Air ☐ Hydraulic ☐ Reverse rotary
☐ Cable ☐ Dug ☐ Other ______

5. WELL CONSTRUCTION

Casing schedule: ☒ Steel ☐ Concrete ☐ Other ______

Thickness	Diameter	From	To
.250 inches	12 inches	+1 feet	256 feet
inches	inches	feet	feet
inches	inches	feet	feet
inches	inches	feet	feet

Was casing drive shoe used? ☐ Yes ☐ No
Was a packer or seal used? ☐ Yes ☒ No
Perforated? ☐ Yes ☒ No
How perforated? ☐ Factory ☐ Knife ☐ Torch
Size of perforation ______ inches by ______ inches

Number	From	To
perforations	feet	feet
perforations	feet	feet
perforations	feet	feet

Well screen installed? ☐ Yes ☐ No
Manufacturer's name ______
Type ______ Model No. ______
Diameter ____ Slot size ____ Set from ______ feet to ______ feet
Diameter ____ Slot size ____ Set from ______ feet to ______ feet
Gravel packed? ☐ Yes ☐ No ☐ Size of gravel ______
Placed from ______ feet to ______ feet
Surface seal depth 20+ Material used in seal: ☒ Cement grout
Bentonite ☒ Puddling clay ☐ Well cuttings
Sealing procedure used: ☐ Slurry pit ☐ Temp. surface casing ☐ Overbore to seal depth
Method of joining casing: ☐ Threaded ☐ Welded ☐ Solvent Weld ☐ Cemented between strata
Describe access port ______

6. LOCATION OF WELL

Sketch map location must agree with written location.

N / W / E / S

Subdivision Name Comora Loma
Well # 3

Lot No. 1 Block No. 6
Division # 2

County Bonneville

SW ¼ NE ¼ Sec. 1, T. 1 N, R. 38 E

7. WATER LEVEL

Static water level 176 feet below land surface.
Flowing? ☐ Yes ☒ No G.P.M. flow ______
Artesian closed-in pressure ______ p.s.i.
Controlled by: ☐ Valve ☐ Cap ☐ Plug
Temperature ____ °F. Quality good

510' well ht.
134 pire ht.
176 static to surface.
25 drawdown est.
306 Elev. grnd to tank
646'

8. WELL TEST DATA

☐ Pump ☐ Bailer ☐ Air ☐ Other ______

Discharge G.P.M.	Pumping Level	Hours Pumped

9. LITHOLOGIC LOG

Hole Diam.	Depth From	Depth To	Material	Water Yes	Water No
16	0	9	Topsoil		X
16	9	48	Chert Rock Gray		X
16	48	52	Obsidion Black		X
16	52	158	Brown Sandstone		X
16	158	254	White Pumice	X	
12	254	260	Chert Rock		X
12	260	270	Broken Brown Sandstone		X
12	270	279	Firm Chertrock		X
12	279	303	Broken Limestone	X	
12	303	312	Hard Limestone		X
12	312	323	Broken Limestone	X	

RECEIVED DEC 31 1979 Department of Water Resources

10.

Work started 6-29-76 finished 7-9-76

11. DRILLERS CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name Andrew Well Drilling Contractors Firm No. 5

Address 1268 E. 17th St. Idaho Falls, Ida. Date 11-24--76

Signed by (Firm Official) Neil J. Andrew

and

(Operator) Hale ______

USE ADDITIONAL SHEETS IF NECESSARY — FORWARD THE WHITE COPY TO THE DEPARTMENT

. DRILLING SERVICES PUMP DATA SHEET 07/17/03

Submersible

.n list: ---

.n Criteria:
ow: 700 US gpm
Head: 580 ft
Tolerance: --- % of head

Fluid: Water
Temperature: 60 °F
SG: 1
Viscosity: 1.105 cP
Vapor pressure: 0.2563 psi a
Atm pressure: 14.7 psi a

NPSHa: --- ft

Advanced Criteria:
Preferred Operating Area: ---
Secondary Operating Point: ---
Max temperature: --- °F
Max suction pressure: --- psi g
Max sphere size: --- in
Max power: --- bhp
Max suction specific speed: --- (Nss)
Min trim: --- % of max diameter
Min head rise: --- % to shutoff

Curve Corrections: none

Well #3

Catalog: Goulds Sub 60Hz vers 2.03

Pump: 9RCLC (4 stages)
Type: Submersible
Synch speed: 3600 rpm
Speed: 3450 rpm
Dia: 6.5 in
Curve no.: E6209CFPCO

Specific Speeds
Ns: 2290 Nss: ---

Dimensions:
Suction: --- in Discharge: --- in

Vertical Turbine:
Bowl size: 9.25 in
Max lateral: 0.88 in
Thrust K factor: 4.9 lb/ft

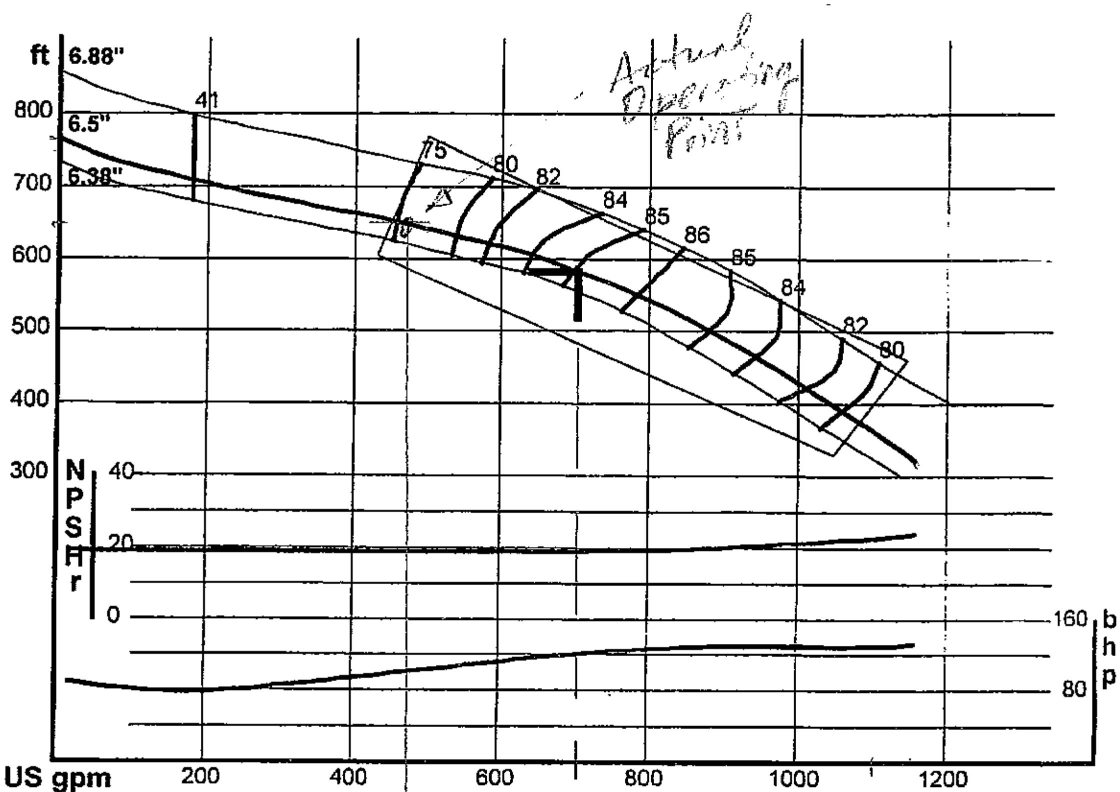
Pump Limits:
Temperature: 120 °F
Pressure: 400 psi g
Sphere size: 0.56 in
Power: --- bhp

Motor: 150 hp
Speed: 3600
Frame: "8"""
Standard: NEMA
Enclosure: SUB
Sizing criteria: Max Power on Design Curve

---- Data Point ----
Flow: 700 US gpm
Head: 581 ft
Eff: 85.1%
Power: 120 bhp
NPSHr: 19 ft

-- Design Curve --
Shutoff Head: 762 ft
Shutoff dP: 329 psi
Min Flow: --- US gpm
BEP: 86% eff
@ 780 US gpm
NOL Pwr: 132 bhp
@ 1151 US gpm

-- Max Curve --
Max Pwr: 158 bhp
@ 1204 US gpm



Pump note: Suction Size-6" Discharge Sizes-5",6",8"

Turbine Pump Selection vers 7.1

Well #4

Form 238-7
11/91

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

WELL DRILLER'S REPORT

USE TYPEWRITER OR BALLPOINT PEN

State law requires that this report be filed with the Director, Department of Water Resources within 30 days after the completion or abandonment of the well.

1. WELL OWNER

Name Comora Loma Water Corp
Address 5355 Neveso Circle, Idaho Falls,
Drilling Permit No. 25-91-E-063
Water Right Permit No.

2. NATURE OF WORK

☒ New well ☐ Deepened ☐ Replacement
☐ Well diameter increase ☐ Modification
☐ Abandoned (describe abandonment or modification procedures such as liners, screen, materials, plug depths, etc. in lithologic log, section 9.)

3. PROPOSED USE

☐ Domestic ☐ Irrigation ☐ Monitor
☐ Industrial ☐ Stock ☐ Waste Disposal or Injection
☒ Other Municipl (specify type)

4. METHOD DRILLED

☒ Rotary ☐ Air ☐ Auger ☐ Reverse rotary
☐ Cable ☐ Mud ☐ Other (backhoe, hydraulic, etc.)

5. WELL CONSTRUCTION

Casing schedule: ☒ Steel ☐ Concrete ☐ Other

Thickness	Diameter	From	To
.250 inches	12 inches	+ 1 feet	311 feet
.250 inches	10 inches	281 feet	503 feet
inches	inches	feet	feet

Was casing drive shoe used? ☒ Yes ☐ No
Was a packer or seal used? ☐ Yes ☒ No
Perforated? ☒ Yes ☐ No
How perforated? ☒ Factory ☐ Knife ☐ Torch ☐ Gun
Size of perforation? 1/4 inches by 2 inches

Number	From	To
5460 perforations	412 feet	503 feet
perforations	feet	feet
perforations	feet	feet

Well screen installed? ☐ Yes ☒ No
Manufacturer ______ Type ______
Top Packer or Headpipe ______
Bottom of Tailpipe ______

Diameter ___ Slot size ___ Set from ___ feet to ___ feet
Diameter ___ Slot size ___ Set from ___ feet to ___ feet
Gravel packed? ☐ Yes ☒ No ☐ Size of gravel ______
Placed from ______ feet to ______ feet

Surface seal depth 311 Material used in seal: ☒ Cement grout ☐ Bentonite ☐ Puddling clay ☐ ______
Sealing procedure used: ☐ Slurry pit ☐ Temp. surface casing ☒ Overbore to seal depth
Method of joining casing: ☐ Threaded ☒ Welded ☐ Solvent Weld ☐ Cemented between strata
Describe access port Well Cap

6. LOCATION OF WELL

Sketch map location must agree with written location.

Subdivision Name Comora Loma
Lot No. ______ Block No. ______
County Bonneville County
SE 1/4 NE 1/4 Sec. 1, T. 1N ☐ N ☐ S, R. 38E ☐ E ☐ W

7. WATER LEVEL

Static water level 308 feet below land surface.
Flowing? ☐ Yes ☒ No G.P.M. flow ______
Artesian closed-in pressure ______ p.s.i.
Controlled by: ☐ Valve ☐ Cap ☐ Plug
Temperature 71 °F. Quality Good
Describe artesian or temperature zones below.

8. WELL TEST DATA

☒ Pump ☐ Bailer ☐ Air ☐ Other ______

Discharge G.P.M.	Pumping Level	Hours Pumped
850	320	8

9. LITHOLOGIC LOG

Bore Diam.	Depth From	Depth To	Material	Water Yes	Water No
16	0	38	Brown Soil		X
	38	55	Brown Riolite		X
	55	62	Dark Gray Sandstone		X
	62	118	Brown Sandstone		X
	118	246	White Pumice		X
	246	255	Brown Riolite		X
	255	282	Hard gray chert rock		X
	282	290	Broken brown riolite		X
	290	311	Firm brown riolite		X
12	311	321	Firm gray basalt		X
	321	325	Brown riolite		X
	325	330	Browken riolite		X
	330	335	Firm Riolite		X
	335	340	Broken Riolite	X	
	340	345	Firm riolite		X
	345	351	Hard riolite		X
	351	360	Broken riolite	X	
	360	408	Firm riolite		X
	408	415	Black broken basalt		X
	415	421	Black broken basalt	X	
	421	428	Brown solid sandstone		X
	428	460	Pumice	X	
	460	491	Pumice		X
	491	495	Brown riolite	X	
	495	500	Firm riolite		X
	500	503	Firm riolite		X
10	503	512	Broken riolite	X	

RECEIVED
FEB 07 1992
Department of Water Resources
Eastern District Office

10.

Work started 6/5/91 finished 7/12/91

11. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name Drew Well Drilling Services Firm No. 5
Address 1268 East 17th Street, Id. Falls Date 7/19/91
Signed by Drilling Supervisor
and
(Operator) (If different than the Drilling Supervisor)

MICROFILMED APR 09 1992

320' Drawdown + static
306' Above ground to tank
5' well ht
54' pipe ht
685 TDH

USE ADDITIONAL SHEETS IF NECESSARY — FORWARD THE WHITE COPY TO THE DEPARTMENT

Franklin Electric

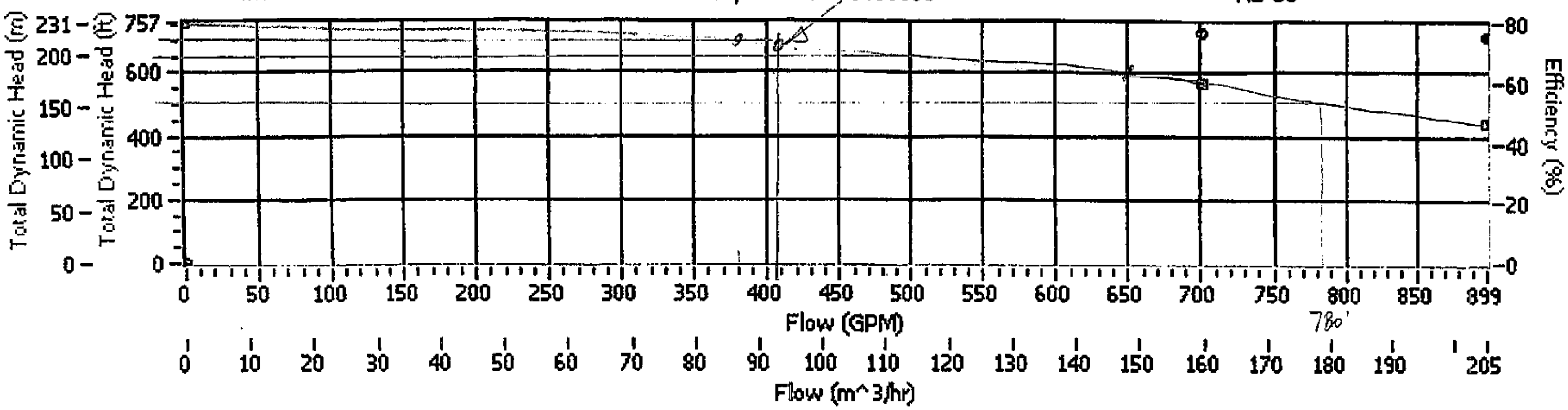
FRANKLIN ELECTRIC
TURBINE PUMP TEST STAND

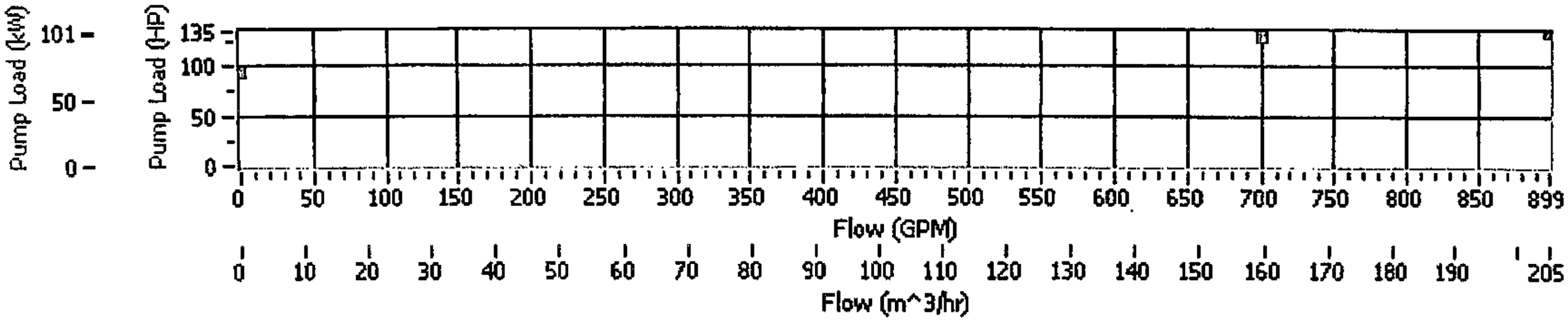
1301 W. Stovall Road
Wilburton, OK 74578
(918) 465-2348

Actual Operating Point

FINAL PRODUCTION TEST DATA

Model 700ST125D8B-0786 | Pump SN 08G19155095 | Hz 60





This is production test data for the pump referenced above, tested on a calibrated motor.
This is not a certified curve, and Franklin Electric does not guarantee this performance under all conditions.

Tested By: RONNIE P

Test Date: 7/22/2008 8:44 AM

Well #4

Well #5

Form 238-7 ANDREW

IDAHO DEPARTMENT OF WATER RESOURCES

WELL DRILLER'S REPORT

Use Typewriter or Ballpoint Pen

RECEIVED
68121 JUL 0 9 1997
Department of Water Resources
Eastern Region

Office Use Only
Inspected by ______
Twp ___ Rge ___ Sec ___
___1/4 ___1/4 ___1/4
Lat: : : Long: : :

1. DRILLING PERMIT NO. 25-97-E-0042-000
Other IDWR No. 25-07652

2. OWNER:
Name Comore Development
Address 3920 E. Sunnyside Rd
City Idaho Falls State ID Zip 83406

3. LOCATION OF WELL by legal description:
Sketch map location must agree with written location.

Twp. 1N North ■ or South □
Rge. 38E East ■ or West □
Sec. 12, ___1/4, NW 1/4, NE 1/4
10 Acres 40 Acres 160 Acres
Gov't Lot ___ County Bonneville
Lat: : : Long: : :
Address of Well Site ______
City Ammon
(Give at least name of Road+ Distance to Road or Landmark)
Lot No. ___ Block No. ___ Subd. Name Comore Loma

4. USE:
□ Domestic □ Municipal □ Monitor □ Irrigation
□ Thermal □ Injection ■ Other Subdivision

5. TYPE OF WORK check all that apply (Replacement ect.)
■ New Well □ Modify □ Abandonment □ Other

6. DRILL METHOD
■ Air Rotary □ Cable □ Mud Rotary □ Other

7. SEALING PROCEDURES

SEAL/FILTER PACK			AMOUNT	
Material	From	To	Sacks or Pounds	Method
Concrete	0	340	9yd	Overbore

Was drive shoe used? □ Y □ N Shoe Depth(s) ______
Was drive shoe seal tested? ■ Y □ N How? Pressure

8. CASING/LINER

Dia	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
16	+2	340	.250	Steel	■	□	■	□
14	330	510	.250	Steel	■	□	■	□
					□	□	□	□

Length of Headpipe: ______ Length of Tailpipe ______

9. PERFORATIONS/SCREENS:
■ Perforations Method Millslot
□ Screens Screen Type ______

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
510	450	1/8x3	2880	14"	Steel	□	■
430	370	1/4x4	720	14"	Steel	□	■
360	340	1/8x3	960	14"	Steel	□	■

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
312 ft below ground Artesian pressure ___ lb
Depth flow encountered ___ ft Describe access port or control devices: Well Seal

11. WELL TESTS:
□ Pump □ Bailer □ Air □ Flowing Artesian

Yield gal/min	Drawdown	Pumping Level	Time
900	31ft	343	24 hr

Water Temp. 81° Bottom hole temp. ______
Water Quality test or comments: ______
Depth first Water Encountered: 300ft

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
24	0	26	Brown Sand, fine		X
20	26	38	Brown Rhyolite		X
	38	66	Soft Brown Rhyolite		X
	66	112	Firm Brown Rhyolite		X
	112	116	Tan Pumice		X
	116	220	White Pumice		X
	220	247	Gray Pumice		X
	247	255	Broken Rhyolite		X
	255	261	Broken Rhyolite and clay		X
	261	272	Firm Rhyolite		X
	272	283	Broken Rhyolite & clay		X
	283	299	Firm Rhyolite		X
	299	322	Broken Rhyolite & Clay	X	
	322	334	Brown Rhyolite		X
	334	340	Hard Gray Rhyolite		X
16	340	356	Hard Gray Rhyolite		X
	356	366	Broken Gray Rhyolite	X	
	366	384	Black Rhyolite		X
	384	414	Fractured Brown Rhyolite	X	
	414	481	Gray Pumice	X	
	481	483	Red Pumice	X	
	483	492	Broken Brown Basalt	X	
	492	502	Tan Pumice		X
	502	520	Broken Brown Basalt	X	

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JUL 1 5 1997
Department of Water Resources

Completed Depth 520ft (Measureable)
Date: Started: 04/28/97 Completed: 6/9/97

13. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.
Firm: Andrew Well Drilling Services, Inc. Firm #5
Firm Official: ______ Date: 7/2/97
and
Supervisor/Operator: Matt Gilbert Date: 7/2/97
Sign one if Firm Official & Operator

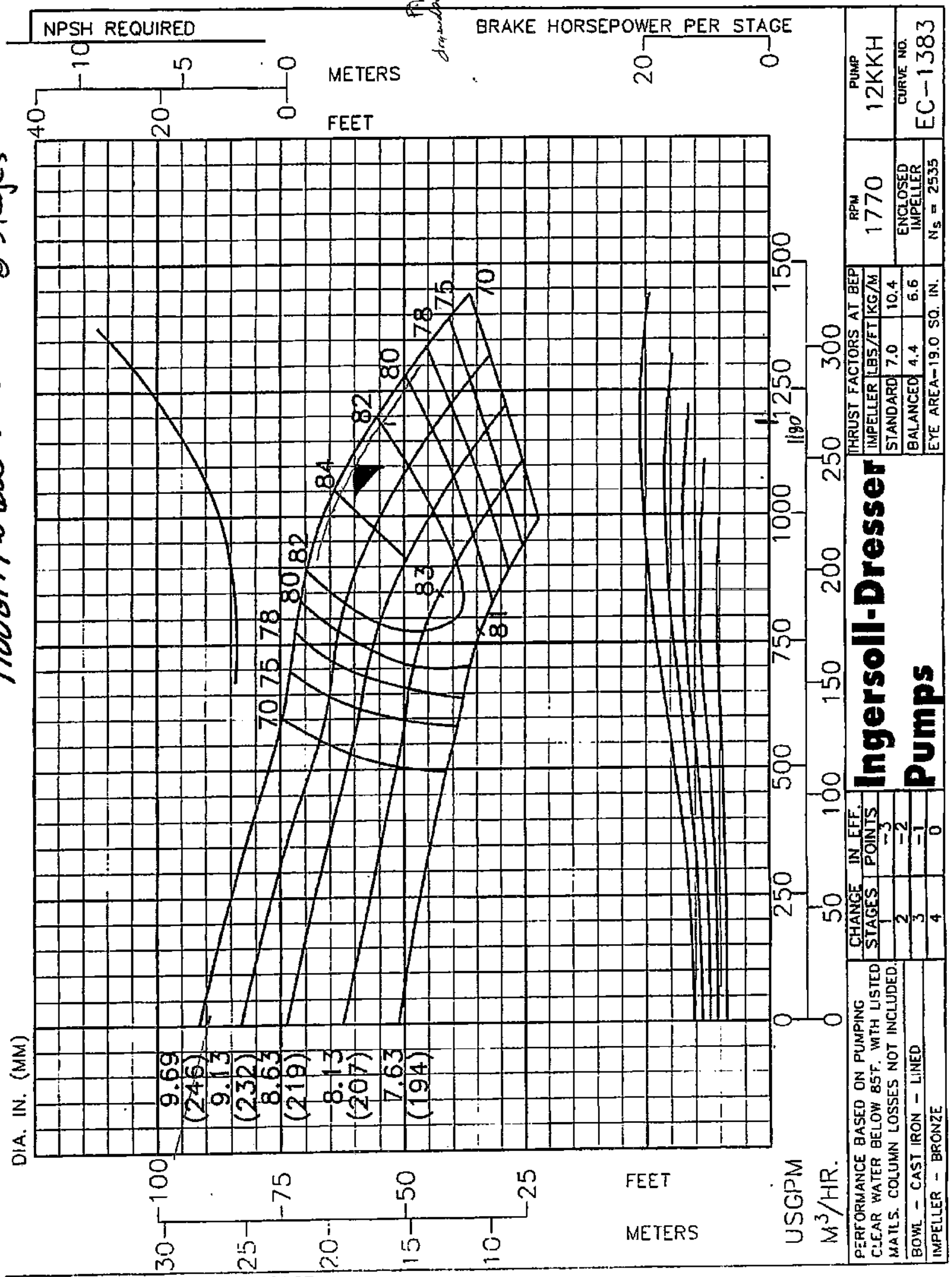
Ingersoll-Dresser Pumps

well Headloss 5'
Pipe Headloss 17'
drawdown + static 351'
head above ground 169'
542'

WELL #5

1100GPM @ 600' TDH

8 stages



Well #6

Form 238-7
11/97
10/01
Andrew

25

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT
Use Typewriter or Ballpoint pen

Office Use Only
Inspected by: ______
Twp ____ Rge ____ Sec ____
____ 1/4 ____ 1/4 ____ 1/4
Lat: : : Long: : :

1. WELL TAG NO.
DRILLING PERMIT NO D0037952
Other IDWR NO.

2 OWNER:
Name: Comore Loma Development
Address: 3920 E Sunnyside Road
City: Ammon State: ID Zip 83406

3 LOCATION OF WELL by legal description.

Twp 2 [x] North [ ] South
Rge 39 [x] East [ ] West
Sec 31 ____ 1/4 SW 1/4 SW 1/4
10 Acres 40 Acres 160 Acres
Gov't Lot County Bonneville
Lat. Long.
Address of Well Site: East end of Township Rd (East 49th South) City: Ammon
(Give at least name of Road + Distance to Road or Landmark)
Lot No. ____ Blk No ____ Subd. Name: Comore Loma

4 USE:
[ ] Domestic [ ] Municipal [ ] Monitor [ ] Irrigation
[ ] Thermal [ ] Injection [x] Other PWS

5 TYPE OF WORK:
[x] New Well [ ] Modify [ ] Abondonment [x] Other

6 DRILL METHOD:
[x] Air Rotary [ ] Cable [ ] Mud Rotary [ ] Other

7 SEALING PROCEDURES:

SEAL/FILTER PACK			AMOUNT	
Material	From	To	Sacks/Pounds	Method
Bentonite	227'	237'	600 lbs	Overbore
Cement	0	227'	23226 lbs	Overbore
Sand	237'	238'	100 lbs	Poured

Was drive shoe used? [ ] Yes [x] No Shoe Depth(s)
Was drive shoe seal tested ? [ ] Yes [x] No How?

8 CASING/LINER:

Dia.	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
16"	+2'	308'	0.375	Steel	[x]	[ ]	[x]	[ ]
					[ ]	[ ]	[ ]	[ ]
					[ ]	[ ]	[ ]	[ ]

Length of Headpipe: Length of Tailpipe:

9 PERFORATIONS/SCREENS:

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
308'	408'	.250x2.5"	2400	16"x.375	Steel	[x]	[ ]
						[ ]	[ ]
						[ ]	[ ]

10 STATIC WATER LEVEL OR ARTESIAN PRESSURE:
252 ft below ground Artesian Pressure: ____ lb
Depth flow encountered: ____ ft
Describe access port or control devices: Sanitary Well Cap

11 WELL TESTS:
[x] Pump [ ] Bailer [ ] Air [ ] Flowing Artesian

Yield	Drawdown	Pumping Level	Time
1500 gpm	52.85	305'	24 hrs

Water Temp ____ Bottom hole temp ____
Water Quality test or comments:
Depth first water encountered:

12 LITHOLOGIC LOG:

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
24"	0	32	Tan silt		X
	32	35	Pumice		X
	35	44	Tan silt		X
	44	48	Gray pumice		X
20"	48	144	Gray pumice		X
	144	158	Brown pumice		X
	158	226	Brown rhyolite		X
	226	230	Silty clay interbed		X
	230	241	Brown and gray rhyolite		X
	241	258	Brown rhyolite very broken		X
	258	269	Very broken brown rhyolite		X
	269	285	Very broken (lost cirulation)		X
	285	325	Very broken brown rhyolite, sand	X	
	325	391	Slightly broken gray rhyolite, pumice	X	
	391	407	Brown rhyolite	X	

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APR 21 2006
Department of Water Resources
Eastern Region

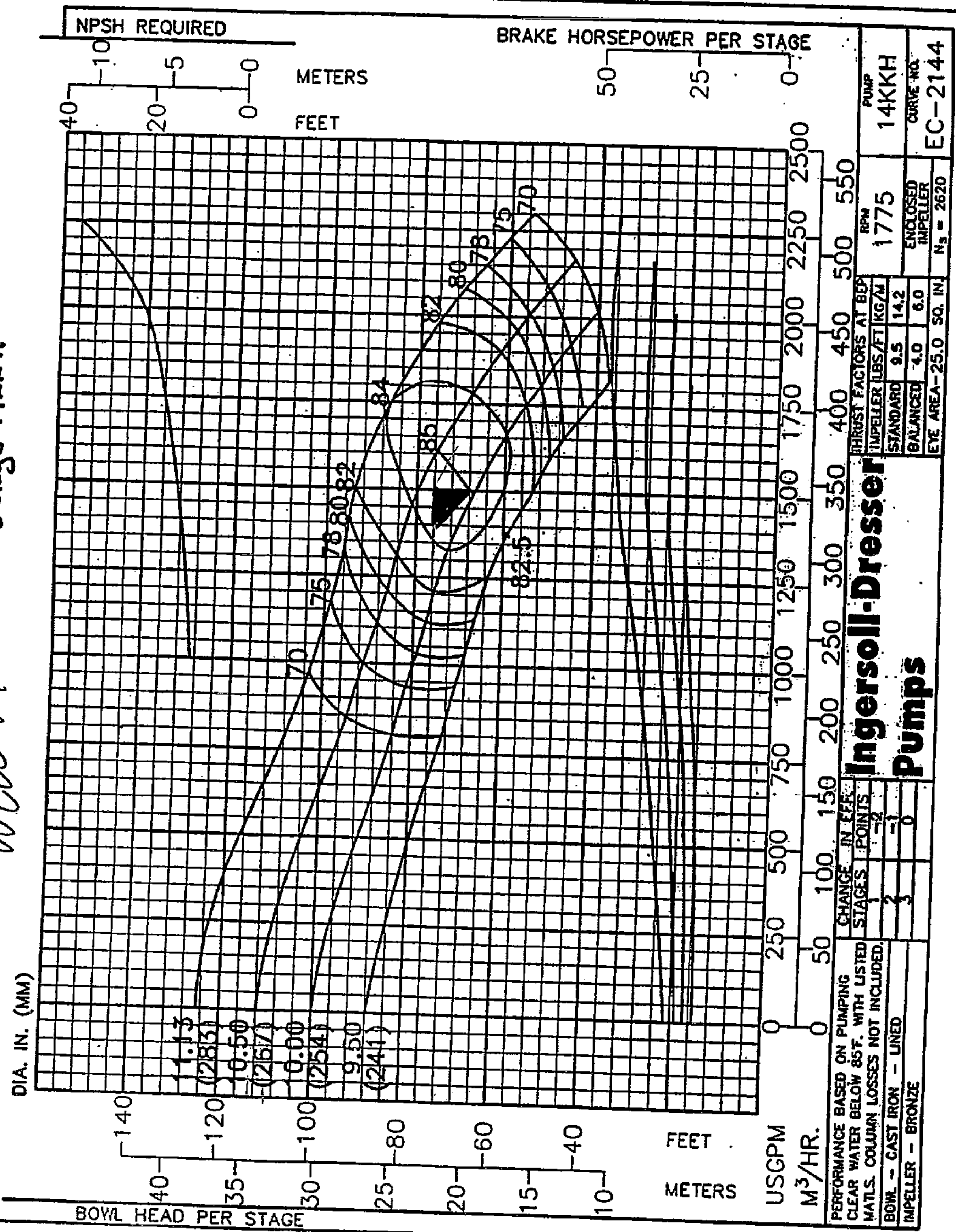
Completed Depth: 408 ft
Date Started: 12/27/05
Date Completed: 01/27/06

13 DRILLER'S CERTIFICATION:
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.
Firm: ANDREW WELL DRILLING SERVICES, INC. Firm: #5
Firm Official: Roger P. Buehler Date: 4/19/2006
and
Supervisor/Operator: Miguel Hernandez Date: 4/19/2006

305
119 ft = 375
530
Press @ Gnd
Static + drawdown = 305'
Elev. to Tank from well head = 233
Elev. when Middle Tank Operational =

Ingersoll-Dresser Pumps

VTP VERTICAL PUMPS



1500 GPM @ 600' TDH
8 stage 14KKH
Well #6

Well #7 (test well)

25

Form 238-7
6/02
Andrew

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Office Use Only
Well ID No. ______
Inspected by: ______
Twp ____ Rge ____ Sec ____
____ 1/4 ____ 1/4 ____ 1/4
Lat: : : Long: : :

1 WELL TAG NO. D 0045651
DRILLING PERMIT NO
Water Right or Injection Well No.

2 OWNER:
Name Comore Loma Development Inc. Well #7
Address: 3920 E Sunnyside Rd
City: Idaho Falls State: ID Zip: 834.06

3 LOCATION OF WELL by legal description.
You must provide address or Lot. Blk. Sub. Or Directions to well.
Twp 1 ☑ North or ☐ South
Rge 39 ☑ East or ☐ West
Sec 6, ____ 1/4 SE 1/4 SE 1/4
10 Acres 40 Acres 160 Acres
Gov't Lot ____ County Bonneville
Lat: 43:26.434 Long: 111:54.590
Address of Well Site:
City: Idaho Falls
(Give at least name of Road + Distance to Road or Landmark)
Lt. ____ Blk ____ Sub. Name: ____

4 USE:
☐ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☑ Other Test

5 TYPE OF WORK: (Replacement etc.)
☑ New Well ☐ Modify ☐ Abandonment ☐ Other ____

6 DRILL METHOD:
☑ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other ____

7 SEALING PROCEDURES:

Seal Material	From	To	Weight / Volume	Seal Placement Method
Bentonite	0	19'	250 lbs	overbore

Was drive shoe used? ☐ Yes ☑ No Shoe Depth(s) ____
Was drive shoe seal tested? ☐ Yes ☑ No How? ____

8 CASING/LINER:

Dia.	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
8'	1	21	.250	steel	☑	☐	☑	☐
					☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe: ____ Length of Tailpipe: ____
Packer ☐ Yes ☑ No Type: ____

9 PERFORATIONS/SCREENS: PACKER TYPE
Perforation Method:
Screen Type & Method of Installation:

From	To	SlotSize	Number	Diameter	Material	Casing	Liner
						☐	☐
						☐	☐
						☐	☐

10 FILTER PACK:

Seal Material	From	To	Weight / Volume	Seal Placement Method

11 STATIC WATER LEVEL OR ARTESIAN PRESSURE:
540 ft. below ground Artesian Pressure: ____ lb
Depth flow encountered: 556 ft
Describe access port or control devices: Sanitary Well Cap

12 WELL TESTS:
☐ Pump ☐ Bailer ☑ Air ☐ Flowing Artesian

Yeild gal/min.	Drawdown	Pumping Level	Time
100+ GPM		700'	2 hrs

Water Temp ____ Bottom hole temp ____
Water Quality test or comments:
Depth first water encountered:

13 LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
10"	0	21	Gray Sand & pumice		x
8"	21	64	Gray Sand & pumice		x
	64	114	Very soft white pumice		x
	114	136	White & brown pumice soft brown soft rhyolite		x
	136	152	Brown Rhyolite		x
	152	154	Brown pumice		x
	154	159	Brown pumice brown rhyolite		x
	159	182	Brown rhyolite		x
	182	191	Grey rhyloite		x
	191	206	Rhyolite brown		x
	206	230	Rhyolite fractured brown		x
	230	256	Rhyloite firm brown		x
	256	261	Rhyolite fractured some silt		x
	261	291	Rhyloite firm brown		x
	291	356	Rhyolite firm brown		x
	356	371	Pumice light grey		x
	371	556	Rhyolite grey firm		x
	556	561	Clay brown gummy		x
	561	591	Rhyolite sand broken	x	x
	591	616	Rhyolite firm brown		x
	616	691	Rhyolite hard fractured	x	
	691	705	Rhyolite fractured	x	
	705	730	Rhyloite hard brown	x	

RECEIVED
AUG 1 3 2007
Department of Water Resources
Eastern Region

Completed Depth 730 (Measurable)
Date: Started 3/2/07 Completed 3/21/07

14 DRILLER'S CERTIFICATION:
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

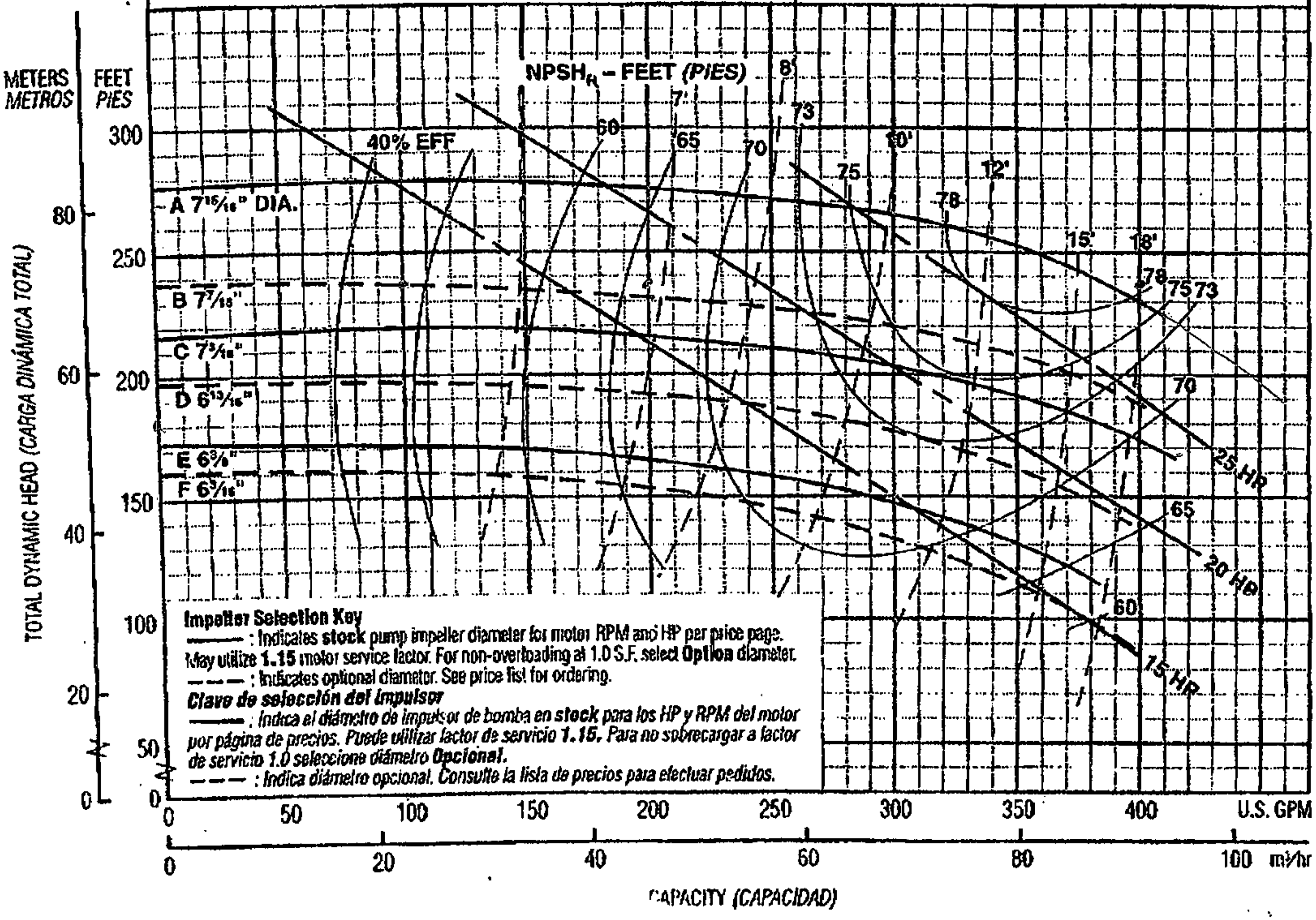
Company Name Andrew Well Drilling Services, Inc. Firm No. 5
Principal Driller [signature] 8-6-07
and
Driller or Operator II [signature] Date: 8-6-07
Operator I ____ Date: ____

Goulds

Middle Fork

Model 7AI/BF / Size (*Tamaño*) 2½ x 3 – 8
RPM 3500 Curve (*Curva*) CN208R00
IMP. DWG. No. 114-50/59022

NOTE: Not recommended for operation beyond printed H-Q curve.
***NOTA:** No se recomienda para funcionamiento superior al impreso en la curva H-Q.*

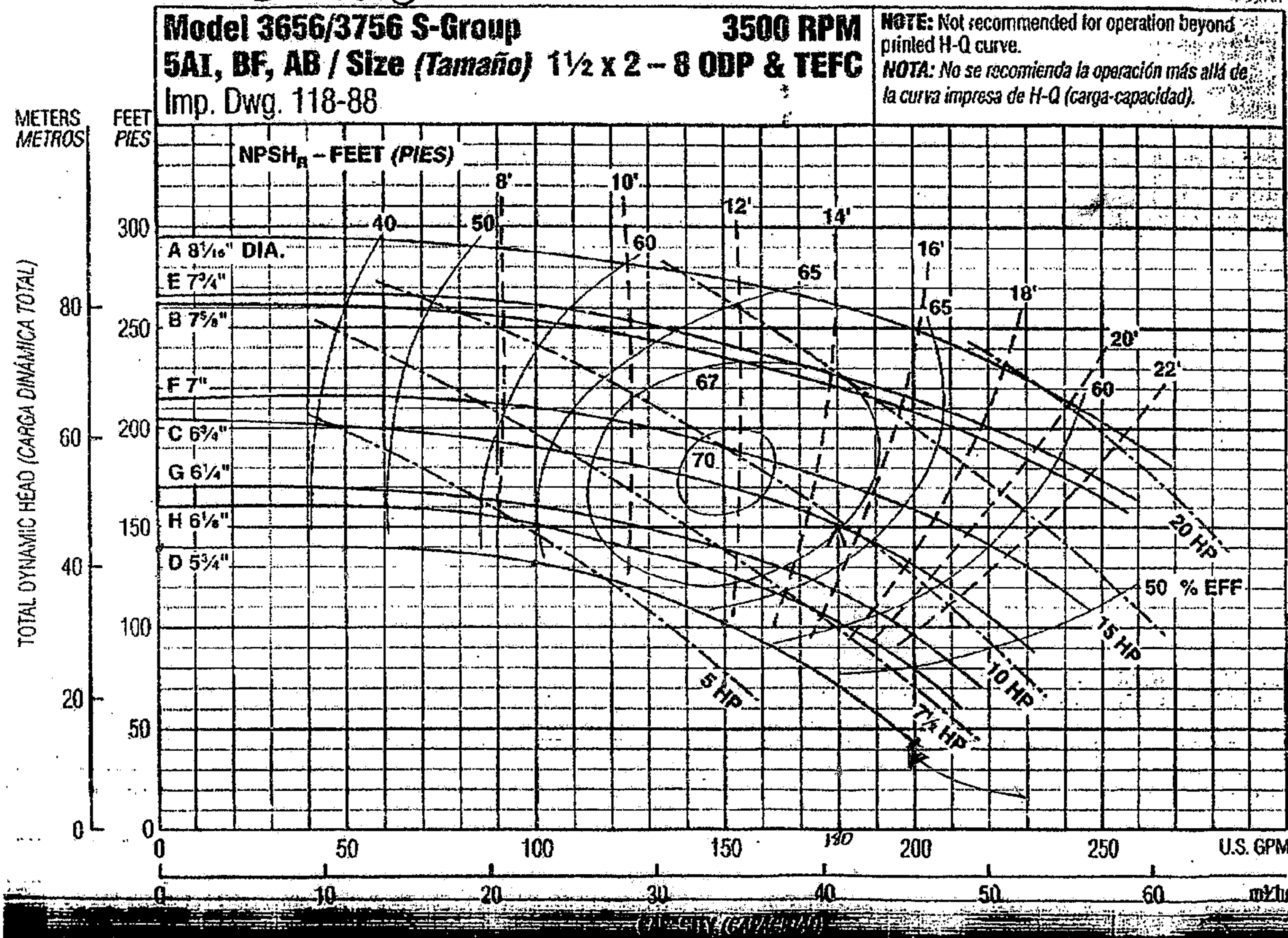


Developing 130 lb. psi
Calculate 141 psi in discharge pipe
Pump sees ≈ 90 psi

1&2 Run First
3&4 Run to supplement 1&2

5 Hp Trim on each pump
Limited by power so trimmed 10 Hp
pumps to 5 Hp.

Sagewood

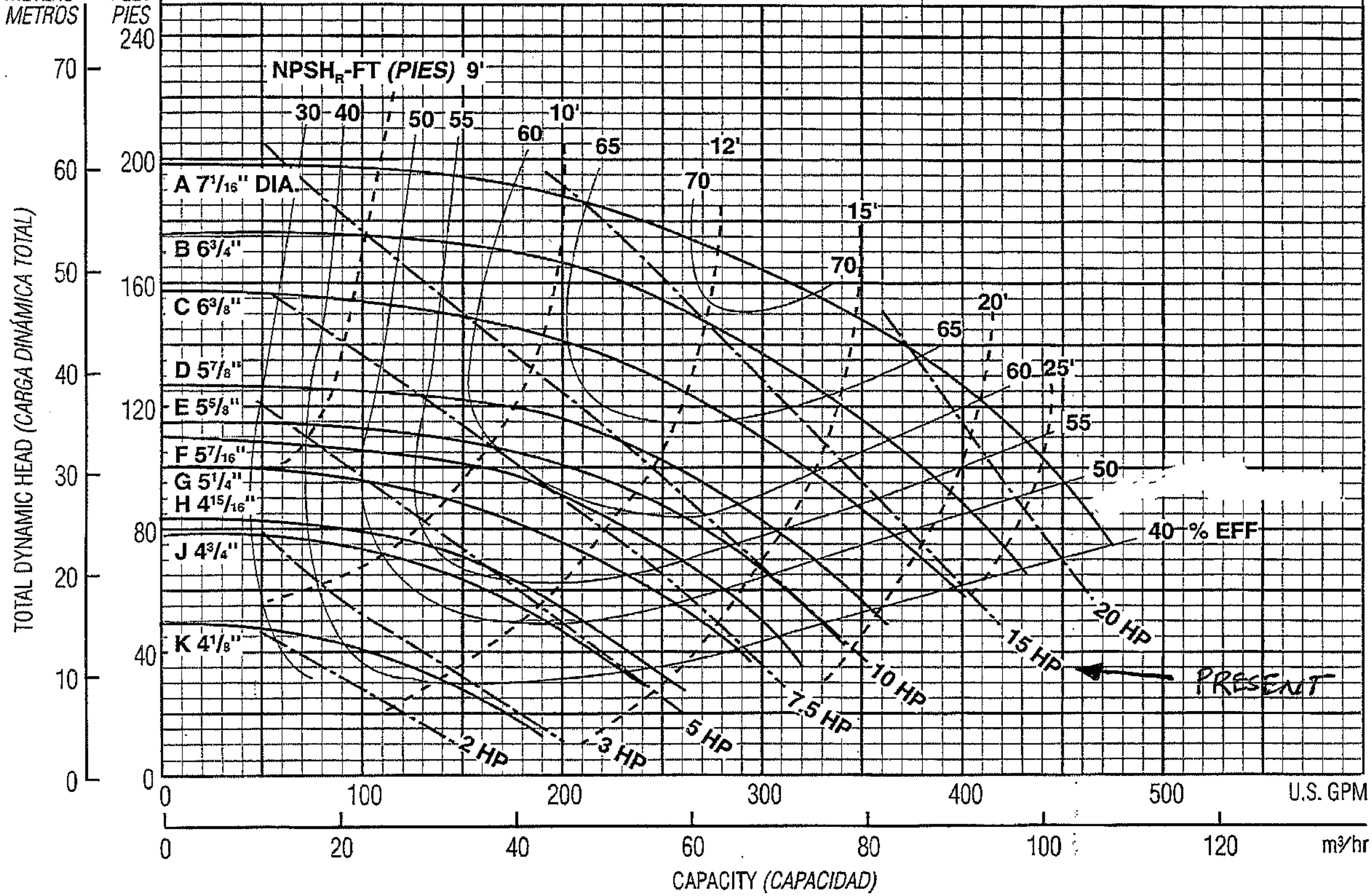


TOTAL P.03

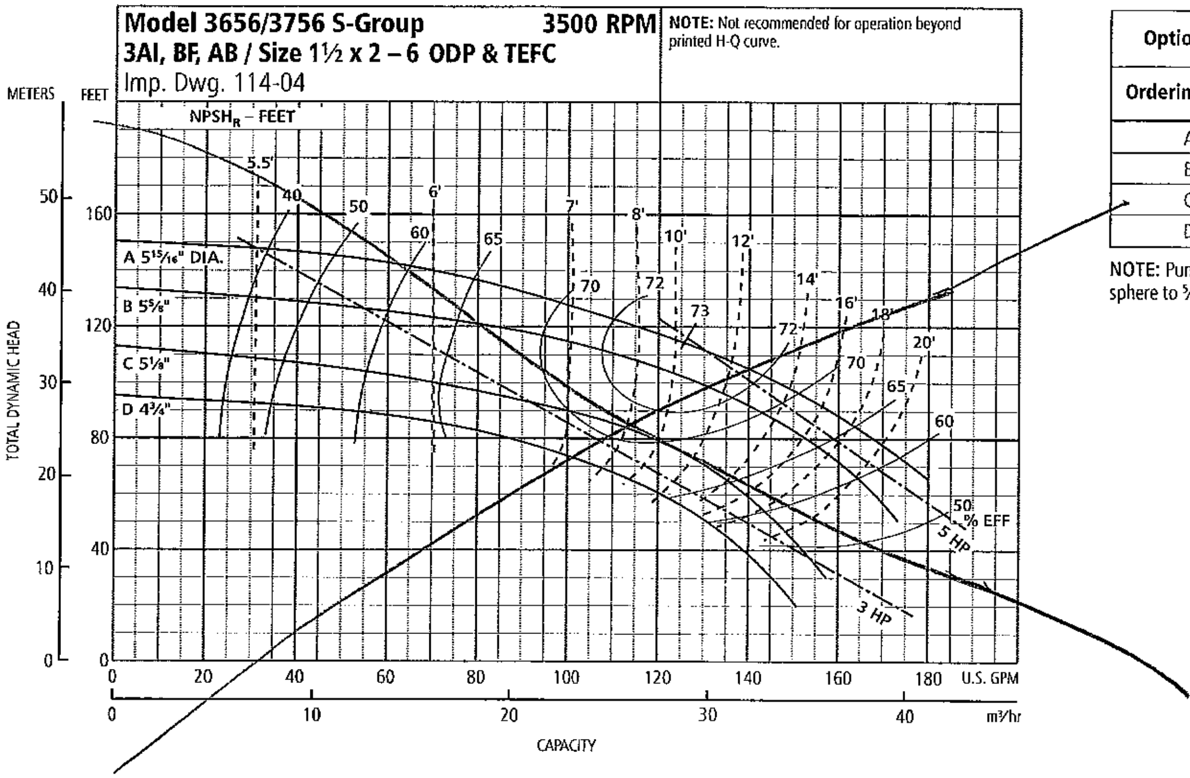
Zone 3 Boosters @ Tank 2

Model 3656/3756 S-Group **3500 RPM**
4AI, BF, AB / Size *(Tamaño)* 2½ x 3 – 7 ODP & TEFC
Imp. Dwg. 120-61

NOTE: Not recommended for operation beyond printed H-Q curve.
NOTA: *No se recomienda la operación más allá de la curva impresa de H-Q (carga-capacidad).*

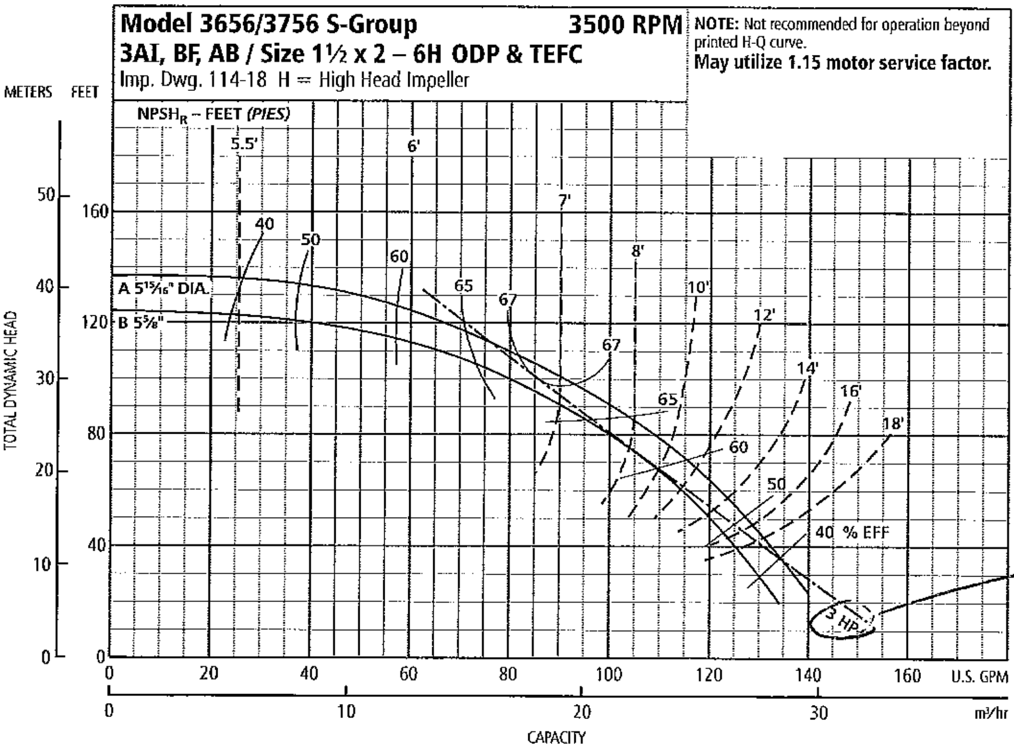


Performance Curves – 60 Hz, 3500 RPM



Optional Impeller	
Ordering Code	Dia.
A	5¹⁵⁄₁₆"
B	5⅝"
C	5⅛"
D	4¾"

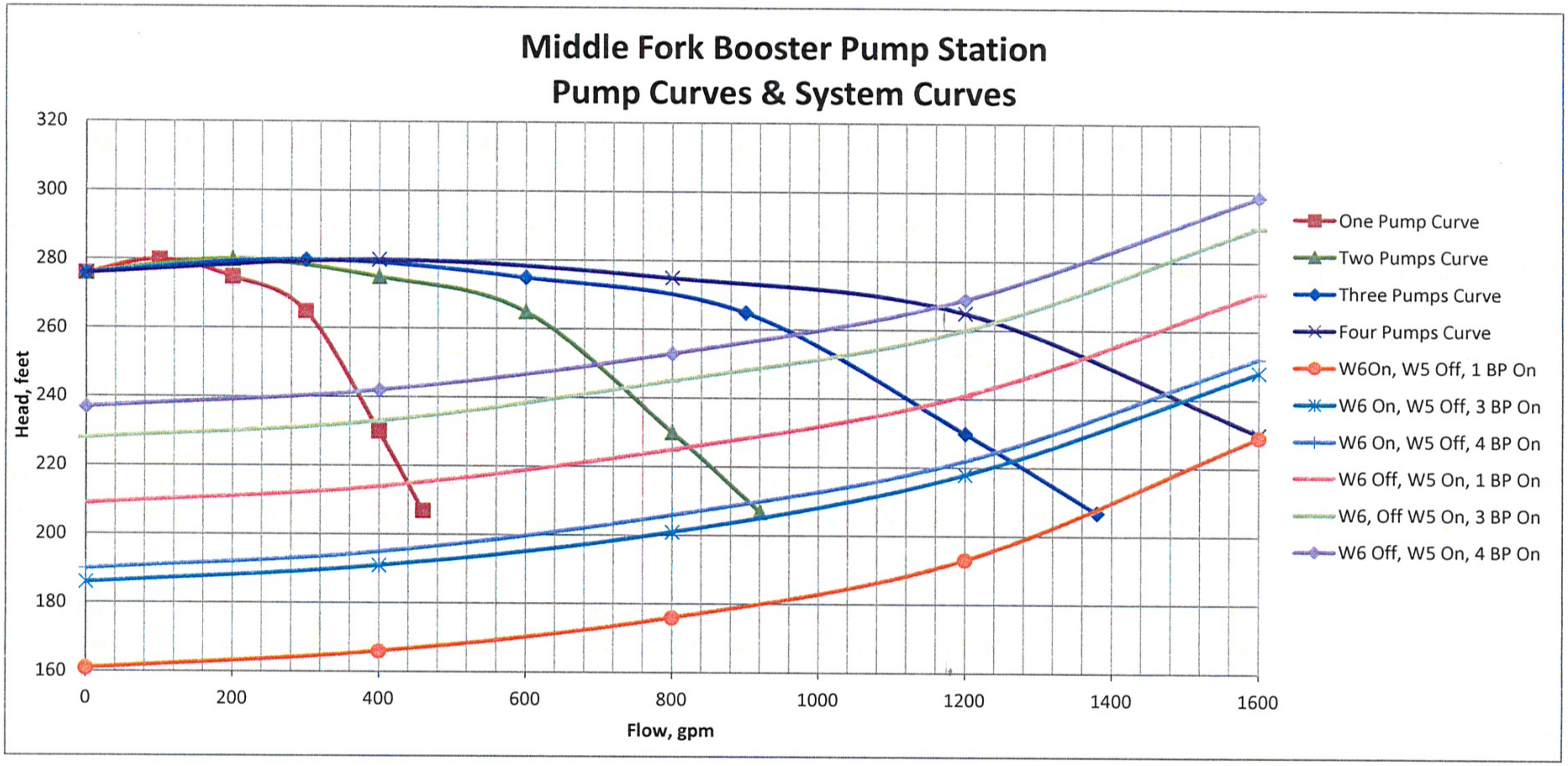
NOTE: Pump will pass a sphere to ⁵⁄₁₆" diameter.



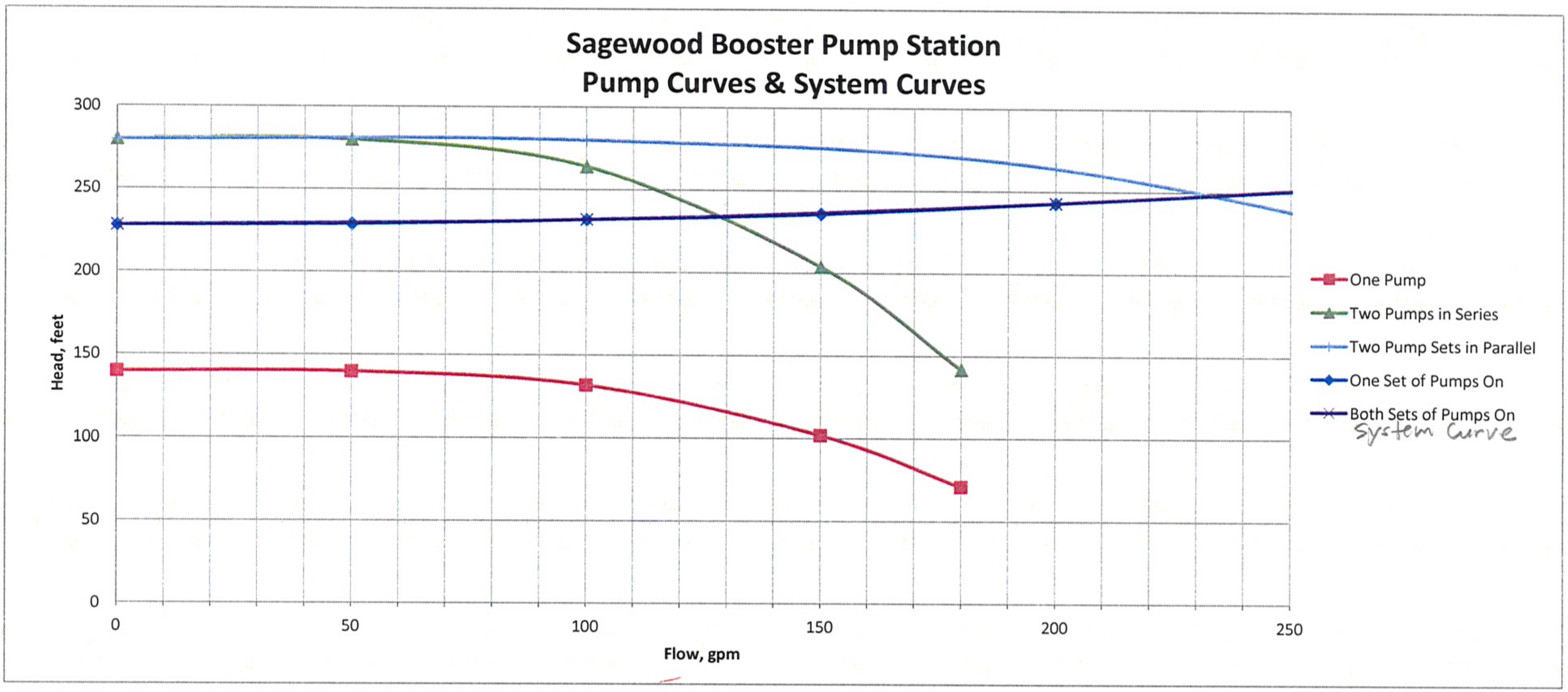
Optional Impeller	
Ordering Code	Dia.
A	5¹⁵⁄₁₆"
B	5⅝"

NOTE: Pump will pass a sphere to ³⁄₁₆" diameter.

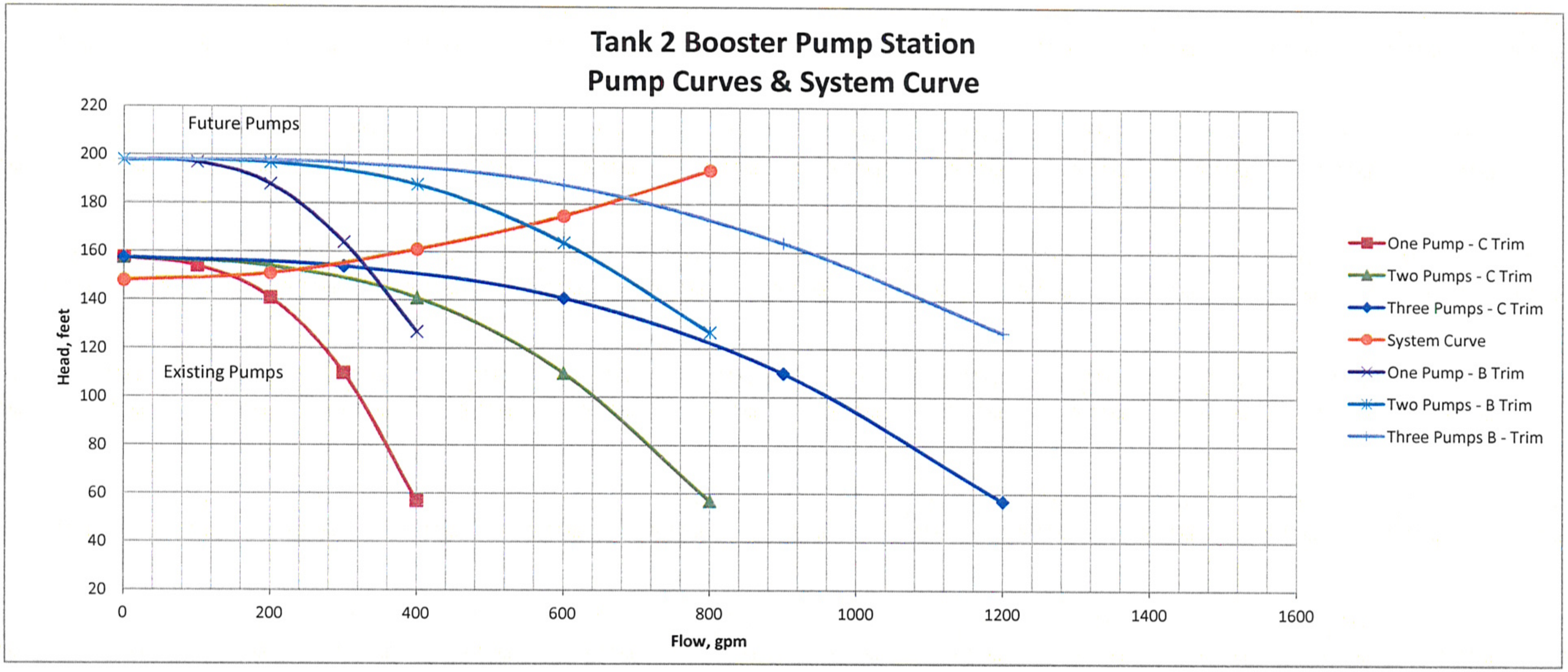
ENSENADA



Middle Fork Booster Pump Station
Pump Curves & System Curves
320
300
280
260
240
220
200
180
160
Head, feet
0
200
400
600
800
1000
1200
1400
1600
Flow, gpm
One Pump Curve
Two Pumps Curve
Three Pumps Curve
Four Pumps Curve
W6On, W5 Off, 1 BP On
W6 On, W5 Off, 3 BP On
W6 On, W5 Off, 4 BP On
W6 Off, W5 On, 1 BP On
W6, Off W5 On, 3 BP On
W6 Off, W5 On, 4 BP On



Prepared by Schiess Associates, 10/23/2012



Tank 2 Booster Pump Station
Pump Curves & System Curve
Head, feet
Flow, gpm
220
200
180
160
140
120
100
80
60
40
20
0
200
400
600
800
1000
1200
1400
1600
Future Pumps
Existing Pumps
One Pump - C Trim
Two Pumps - C Trim
Three Pumps - C Trim
System Curve
One Pump - B Trim
Two Pumps - B Trim
Three Pumps B - Trim

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Water Resources

Water Right and Adjudication Search

↓ Choose One or More Search Items ↓ Click "Search" To Enter Your Parameters HELP!

Name	◉ All ○ Search for a specific Name	HELP!
Adjudication, Water Right & Basin or Transfer	◉ All ○ Search for a specific Basin, Right or Transfer number	HELP!
Location of Use or Diversion (Click to expand or collapse)	○ All ◉ Search for a specific Location by legal description • **Location Type: POD** • **Township: 01N** • **Range: 38E** • **Section: 1**	HELP!
Sources	◉ All ○ Search for Surface Water, Ground Water or a specific Source &/or Tributary	HELP!
Water Use	◉ All ○ Search for a specific Water Use	HELP!
Dates	◉ All ○ Search for a specific Date Type & range of Dates	HELP!
Water Right Types	◉ All ○ Search for one or more specific Water Right Types	HELP!
Status	◉ All ○ Search for both Active & Inactive Records	HELP!

Search Results (23)
(Click to expand or collapse) HELP!

Export Results to Excel | Clear All Items | Start Search

Click any column to sort table

1 2 3

Options	Type	Basin	Sequence	Suffix	Application Number	Basis	Status	Priority Date	Div. Rate (cfs)	Source	Water Use	Owner
Details More Options	Water Right	25	12745			Decreed	Active	06/30/1976	0.04	GROUND WATER	DOMESTIC	DUNCAN, CARRIE M; DUNCAN, LARRY W
Details More Options	Water Right	25	7578			Decreed	Active	08/29/1990	0.3	GROUND WATER	DOMESTIC	COMORE LOMA WATER CORP
Details More Options	Water Right	25	7040			Decreed	Active	09/17/1973	0.2	GROUND WATER	DOMESTIC	COMORE LOMA WATER CO INC ✓
Details More Options	Water Right	25	7042			Decreed	Active	10/26/1973	0.08	GROUND WATER	DOMESTIC	COMORE LOMA WATER CO INC ✓
Details More Options	Water Right	25	7161			Decreed	Active	09/29/1978	0.98	GROUND WATER	DOMESTIC	COMORE LOMA WATER CO INC ✓
Details	Water									GROUND		COMORE DEVELOPMENT

Department of
Water Resources

Water Right and Adjudication Search

Choose One or More Search Items | Click "Search" To Enter Your Parameters HELP!

Name
- All
- Search for a specific Name

Adjudication, Water Right & Basin or Transfer
- All
- Search for a specific Basin, Right or Transfer number

Location of Use or Diversion (Click to expand or collapse)
- All
- Search for a specific Location by legal description
  - **Location Type: POU**
  - **Township: 01N**
  - **Range: 39E**
  - **Section: 6**

Sources
- All
- Search for Surface Water, Ground Water or a specific Source &/or Tributary

Water Use
- All
- Search for a specific Water Use

Dates
- All
- Search for a specific Date Type & range of Dates

Water Right Types
- All
- Search for one or more specific Water Right Types

Status
- All
- Search for both Active & Inactive Records

Search Results (12) (Click to expand or collapse)

Export Results to Excel | Clear All Items | Start Search

Click any column to sort table

1 2

Options	Type	Basin	Sequence	Suffix	Application Number	Basis	Status	Priority Date	Div. Rate (cfs)	Source	Water Use	Owner	
Details More Options	Water Application	1	10613		78374		Active	01/15/2013	3206	SNAKE RIVER, SOUTH FORK SNAKE RIVER	GROUND WATER RECHARGE	IDAHO WATER RESOURCE BOARD	
Details More Options	Water Right	25	7578			Decreed	Active	08/29/1990	0.3	GROUND WATER	DOMESTIC	COMORE LOMA WATER CORP	✓
Details More Options	Water Right	25	7652			Decreed	Active	12/11/1996	1.33	GROUND WATER	DOMESTIC	COMORE DEVELOPMENT INC	✓
Details More Options	Water Right	25	12706			Decreed	Active	07/01/1960	0.13	GROUND WATER	DOMESTIC, IRRIGATION	COMORE DEVELOPMENT INC	✓
Details More Options	Water Right	25	14240			License	Active	06/01/1989	3.83	GROUND WATER	IRRIGATION	COMORE DEVELOPMENT INC	✓
Details	Water											COMORE	

Department of
Water Resources

Water Right and Adjudication Search

Choose One or More Search Items | Click "Search" To Enter Your Parameters HELP!

Name	◉ All ○ Search for a specific Name	HELP!
Adjudication, Water Right & Basin or Transfer	◉ All ○ Search for a specific Basin, Right or Transfer number	HELP!
Location of Use or Diversion (Click to expand or collapse)	○ All ◉ Search for a specific Location by legal description • **Location Type: POU** • **Township: 01N** • **Range: 39E** • **Section: 6**	HELP!
Sources	◉ All ○ Search for Surface Water, Ground Water or a specific Source &/or Tributary	HELP!
Water Use	◉ All ○ Search for a specific Water Use	HELP!
Dates	◉ All ○ Search for a specific Date Type & range of Dates	HELP!
Water Right Types	◉ All ○ Search for one or more specific Water Right Types	HELP!
Status	◉ All ○ Search for both Active & Inactive Records	HELP!

Search Results (12)
(Click to expand or collapse) HELP!

Export Results to Excel | Clear All Items | Start Search

Click any column to sort table

1 2

Options	Type (?)	Basin	Sequence	Suffix	Application Number	Basis	Status	Priority Date	Div. Rate (cfs)	Source	Water Use	Owner
Details More Options	Water Permit	25	14183				Active	04/29/2006	0.5	GROUND WATER	DOMESTIC	COMORE DEVELOPMENT INC
Details More Options	Water Permit	25	14191				Active	01/09/2007	0.8	GROUND WATER	DOMESTIC	COMORE DEVELOPMENT INC

1 2

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More Options	Water Right	25	14242			Decreed	Active	05/01/1980	0.29	GROUND WATER	IRRIGATION	DEVELOPMENT INC
Details More Options	Water Right	25	14243			Decreed	Active	05/06/1957	0.53	GROUND WATER	IRRIGATION	COMORE DEVELOPMENT INC
Details More Options	Water Right	25	14340			Decreed	Active	03/20/1961	0.56	GROUND WATER	IRRIGATION	COMORE DEVELOPMENT INC
Details More Options	Water Permit	25	14166				Active	03/28/2005	2.6	GROUND WATER	DOMESTIC	COMORE DEVELOPMENT INC
Details More Options	Water Permit	25	14167				Active	04/12/2005	2.6	GROUND WATER	DOMESTIC	COMORE DEVELOPMENT INC

1 2

Export Results to Excel | Clear All Items | Start Search

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Summary

Water Rights	7040	0.20 CFS	Comore Loma Water Corp
	7042	0.08	
	7161	0.98	
	7578	0.30	
8.23 CFS	7652	1.33	Comore Development Inc.
3964 gpm	12706	0.13	
	14240	3.83	
	14242	0.29	
	14243	0.53	
	14340	0.56	
Water Permits	14166	2.60	
	14167	2.60	
6.5 CFS	14183	0.50	
2917 gpm	14191	0.80	

Total = 6,611 gpm or 14.73 CFS

Appendix B: System Analysis and Modeling Data

- Model Assumptions
- Extracted Flow Data (2 11X17 sheets)
- Existing System Analysis (4 11X17 sheets)
- Model Calibration Data (2 pages)
- Summary Output for 1,500 gpm Fire Flow (4 pages)
- Sample WaterCAD Output for Hydrant 3 at 1,500 gpm Fire Flow (4 pages)
- Summary Output for 250 gpm Fire Flow (4 pages)
- Sample WaterCAD Output for Hydrant 3 at 250 gpm Fire Flow (4 pages)
- Map showing Hydrants tested for Fire Flow and Results at 1,500 gpm Fire Flow (1 11X17 sheet)
- Map Showing Sample Output, Scenario HYD 3, Max Day Flow at 1,500 gpm Fire Flow (1 11X17 sheet)
- Map Showing Future Peak Hour Output at 10 gpm/connection (1 11X17 sheet)
- Future System Analysis (6 11X17 sheets)
- Preliminary Size Calculations for Booster Pump Stations, Storage Tanks, and Well Pumps (6 pages)

Assumptions for Model Development

1. Each home in each zone uses the same amount of water.

2. Annual flow totals were based on actual pump run times extracted from the system SCADA system for January and July 2011. Assumptions were used for the pump rates of each pump for both months. Water use during the other months was estimated from these months and from judgment to determine monthly and annual volumes of water. The data year used was 2011. The year 2011 was considered a normal year when considering the availability of operating pumps and the pump start order in the summer and winter. A chart depicting the distribution of monthly water use is attached.

3. A review of the SCADA system pump run-time data and tank level data revealed that the peak hour flow in the year 2011 occurred during the night on July 4. At this time, all well pumps were running and both Tank 1 and Tank 2 were losing water to meet system demands.

4. Flow rates at each well used in spreadsheet calculations are as follows:

Well 1:	Out of service
Well 2:	200 gpm
Well 3:	700 gpm
Well 4:	750 gpm
Well 5:	1,100 gpm
Well 6:	1,500 gpm

5. WaterCad V8XM was used to model the distribution and pumping systems. Actual well pump curves were used to depict well pumps. Actual booster pump station curves were used to depict booster pumps. Curves were adjusted depending on how many boosters were running to duplicate field conditions. The entire roadway system was surveyed with GPS technology to properly assign elevations to each pipe intersection and/or node in the system. Node elevations were assumed to be five feet below the surveyed elevation on the roadway. Hydrant nozzle elevations were assumed to be three feet above the surveyed elevation on the adjacent roadway.

6. To meet redundancy requirements of the drinking water rules, well capacity was calculated assuming the largest well was out of service and each booster pump station had a pump out of service (two pumps in the case of Sagewood BPS since each side of the duplex pump system consists of two pumps operating in series). Pump curves are provide in Appendix A, including curves representing multiple pumps operating together for booster pumps. The firm well capacity used in this report is 2,750 gpm (Well 6 out of service). System curves for each well and booster pump station were determined using surveyed elevations and head loss estimates using accepted calculation procedures.

Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Pump run times (each entry = a run time) and amount run each time in minutes	48	1434	1440	1440	962	1440	1440	645	7	511	267	576	396	52	39	302
	72				2				48	73	65		2	60	63	201
	49				3				2		64		7	63	40	37
	37				3				71				3	52	38	24
	38				417								21	33	29	25
	45												30	16	27	18
	39												11	21	26	17
	26												13	24	32	16
	25												15		23	7
	26														21	18
	18														16	36
	21														24	70
	20														17	45
	24														18	
	39														26	
	85														34	
	14														63	
															47	
total	**626**	**1434**	**1440**	**1440**	**1387**	**1440**	**1440**	**645**	**128**	**584**	**396**	**576**	**498**	**321**	**583**	**816**
flow (gal)	**688,600**	**1,577,400**	**1,584,000**	**1,584,000**	**1,525,700**	**1,584,000**	**1,584,000**	**709,500**	**140,800**	**642,400**	**435,600**	**633,600**	**547,800**	**353,100**	**641,300**	**897,600**

Day	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Pump run times (each entry = a run time) and amount run each time in minutes	251	273	222	424	212	375	210	277	346	483	357	508	3	533	272
	98	124	54	76	51	91	47	63	104	33	91	29	100	30	56
	64	65	43	25	80	61	56	122	33	42	29	23	68	22	57
	50	37	50	21	41	44	57	42	29	20	27	22	50	22	39
	30	24	50	20	33	28	25	22	25	18	21	19	43	21	27
	23	19	34	18	25	19	23	26	25	16	19	14	26	20	22
	26	8	21	16	20	15	20	22	20	18	18	17	24	19	22
	24	18	20	19	17	14	19	17	18	23	17	21	23	18	22
	21	18	18	21	16	18	15	16	16	40	17	50	21	22	15
	19	16	17	27	16	23	16	16	16	41	19	9	17	25	21
	16	18	19	35	24	22	24	16	25	70	24		17	33	30
	16	17	16	49	195	29	40	18	23	30	23		18	64	39
	33	33	21			39	128	27	108		21		16	24	10
	28	57	31			23		48	47		60		18		
	31	62	173					159			69		26		
	187										15		35		
													117		
total	**917**	**789**	**789**	**751**	**730**	**801**	**680**	**891**	**835**	**834**	**827**	**712**	**622**	**853**	**632**
flow (gal)	**1,008,700**	**867,900**	**867,900**	**826,100**	**803,000**	**881,100**	**748,000**	**980,100**	**918,500**	**917,400**	**909,700**	**783,200**	**684,200**	**938,300**	**695,200**

January 2011

Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Pump run times (each entry = a run time) and amount run each time in minutes				1												
total				**1**												
flow (gal)				**1,100**												

Day	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Pump run times (each entry = a run time) and amount run each time in minutes							12		1						
									21						
									92						
total							**12**		**114**						
flow (gal)							**13,200**		**125,400**						

July 2011 Well Flow Summary

Well #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Totals
2	259,400	287,000	287,400	288,000	288,000	288,000	288,000	236,200	282,400	288,000	287,800	275,800	267,000	268,000	377,000	247,600	282,000	255,600	256,200	222,000	255,400	254,200	278,200	273,600	270,000	272,400	267,200	244,000	268,800	263,400	257,200	8,435,800
3	1,400	780,500	896,000	798,700	889,700	810,600	922,600	900,200	919,100	902,300	977,900	546,700	379,400	285,600	0	203,700	80,500	137,200	30,800	196,000	30,100	179,900	112,700	61,600	121,800	154,000	118,300	250,600	134,400	133,700	29,400	11,985,400
4	0	750	287,250	587,250	576,000	584,250	583,500	645,000	393,000	561,750	495,750	449,250	48,750	162,750	0	0	0	29,250	0	84,000	0	57,750	0	30,000	0	39,000	0	90,000	142,500	42,000	0	5,889,750
5	688,600	1,577,400	1,584,000	1,584,000	1,525,700	1,584,000	1,584,000	709,500	140,800	642,400	435,600	633,600	547,800	353,100	641,300	897,600	1,008,700	867,900	867,900	826,100	803,000	881,100	748,000	980,100	918,500	917,400	909,700	783,200	684,200	938,300	695,200	27,958,700
6	2,160,000	2,160,000	2,160,000	2,160,000	2,160,000	2,160,000	2,160,000	2,160,000	2,160,000	2,160,000	2,160,000	1,885,500	2,032,500	2,079,000	2,145,000	2,160,000	2,160,000	2,154,000	2,160,000	2,160,000	2,160,000	2,154,000	2,160,000	2,160,000	2,160,000	2,160,000	2,160,000	2,160,000	2,160,000	2,160,000	2,139,000	66,429,000
Total	3,109,400	4,805,650	5,214,650	5,417,950	5,439,400	5,426,850	$\boxed{5,538,100}$	4,650,900	3,895,300	4,554,450	4,357,050	3,790,850	3,275,450	3,148,450	3,163,300	3,508,900	3,531,200	3,443,950	3,314,900	3,488,100	3,248,500	3,526,950	3,298,900	3,505,300	3,470,300	3,542,800	3,455,200	3,527,800	3,389,900	3,537,400	3,120,800	120,698,650
							max day																									2,704
							max week	5,213,357	gal																							gpm
								5.9%	less than max day																							

January 2011 Well Flow Summary

Well #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Totals
2	107,600	103,400	104,600	96,600	89,800	96,800	89,400	102,000	99,000	100,000	93,000	92,000	95,400	93,200	95,800	106,400	101,800	96,400	91,600	95,600	81,600	66,600	88,200	121,000	23,800	90,400	119,800	55,600	112,800	101,000	59,000	2,870,200
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,400	0	0	0	0	1,400	0	0	0	0	0	0	0	0	2,800
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	1,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13,200	0	125,400	0	0	0	0	0	0	139,700
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	107,600	103,400	104,600	97,700	89,800	96,800	89,400	102,000	99,000	100,000	93,000	92,000	95,400	93,200	95,800	106,400	101,800	97,800	91,600	95,600	81,600	66,600	102,800	121,000	149,200	90,400	119,800	55,600	112,800	101,000	59,000	3,012,700

Comore Loma Water System

Existing System Analysis at 10 gpm/connection at Peak Hour Flow

	Overall	Zone 1	Zone 2	Zone 3	Zone 4
No. of homes Being Served	320	165	131	24	0
Average Daily Flow, gpm	751	387	307	56	0
Maximum Day Flow, gpm	2,647	1365	1083	198	0
Max Day/Avg Day Ratio	3.5	3.5	3.5	3.5	#DIV/0!
Peak Hour Flow, gpm	3,200	1,650	1,310	240	0
Peak Hour/Avg Day Ratio	4.3	4.3	4.3	4.3	#DIV/0!
Averge Winter Day, gpm	67	35	28	5	0
Peak Hour/Maximum Day Ratio	1.2	1.2	1.2	1.2	#DIV/0!
Average Daily Flow/Connection, gpm	2.3				
Maximum Day Flow/Connection, gpm	8.3				
Peak Hour Flow/Connection, gpm	10.0				
Fire Flow Demand, gpm	1,500	Increased to 1,500 gpm on Aug. 14, 2003.			
Required Fire Flow Storage, gal	180,000				

Well Capacity into Zone 1 Tank and Zone 2 Booster Stations

Well 2	200	gpm
Well 3	700	gpm
Well 4	750	gpm
Well 5	1,100	gpm
Well 6	1,500	gpm
Total	4,250	gpm

Zone 1-Zone 2 Firm Booster Pump Capacity

Middle Fork (3 of 4 Pumps)	1,020 gpm
Sagewood (1 of 2 Pump Sets)	130 gpm
Total	1,150 gpm

Overall System Analysis

Peak Hour Demand With Any Source Out of Service Without Equalization Storage (502.17)

Peak Hour Demand	3,200 gpm
Firm Well Capacity	2,750 gpm
Shortage	450 gpm

Maximum Day Demand Plus Fire Flow With Any Source Out of Service (502.18)

Maximum Day Demand	2,647 gpm
Fire Flow Demand	1,500 gpm
Total Demand	4,147 gpm
Firm Well Capacity	2,750 gpm
Tank 1 Fire Flow Storage	564 gpm
Shortage	833 gpm

Actual Storage Condition in Zone 1

Operational Storage	15,625 gpm
Fire Flow Storage	67,672 gal
Standby Storage*	16,703 gal
Dead Storage	0 gal
Total	100,000 gal

Zone 1 Storage Tank Need Analysis (544.01&501.07) if Firm Well Capacity = Maximum Day Demand

Operational Storage			25,000 gal
Fire Flow Storage			180,000 gal
Equalization Storage	factor=	0.08	154,075 gal
Standby Storage*			16,703 gal
Dead Storage			0 gal
Total			375,779 gal

Maximum Day Demand Plus Fire Flow With Any Source Out of Service (502.18)

Maximum Day Demand	2,647 gpm
Fire Flow Demand	1,500 gpm
Total Demand	4,147 gpm
Firm Well Capacity	2,750 gpm
Tank 1 Fire Flow Storage	1,500 gpm
Shortage	-103 gpm

Zone 1 Storage Tank Need Analysis (544.01&501.07) if Firm Well Capacity = Peak Hour Demand

Operational Storage	25,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage	0 gal
Standby Storage*	16,703 gal
Dead Storage	0 gal
Total	221,703 gal

*Used wintertime averge daily flow in lieu of average daily flow

Emergency Operation Analysis (501.07)

New tank: no generator needed, but advisable to get water into Tank 1 so it can be pumped up the hill.	
Existing tank	**936 gpm**

Options to Meet Requirements of 501.07, 544.01, 502.17 & 502.18

Max Day Firm Well Pump Capacity Plus Fire & Standby Storage

Keep Existing Tank	**100,000 gal**
Drill new well(s)	**833 gpm**

or

Peak Hour Firm Well Pump Capacity Plus Fire & Standby Storage

Build new Tank 1	**221,703 gal**
Drill new well(s)	**450 gpm**

or

Max Day Firm Well Pump Capacity Plus Fire, Equalization & Standby Storage

Build new Tank 1	**375,779 gal**
Drill new well(s)	**0 gpm**

Continued on page 2

Zones 2, 3 & 4 Analysis

Peak Hour Demand With Any Source Out of Service Without Equalization Storage (502.17)

Peak Hour Demand	1,550 gpm
Firm Booster Pump Capacity	1,150 gpm
Shortage	**400 gpm**

Maximum Day Demand Plus Fire Flow With Any Source Out of Service (502.18)

Maximum Day Demand	1,282 gpm
Fire Flow Demand	1,500 gpm
Total Demand	2,782 gpm
Firm Booster Pump Capacity	1,150 gpm
Tank 2 Credit for Fire Flow Storage (101,796 gal/2hrs)	994 gpm
Future Tank 3 Credit for Fire Flow Storage	506 gpm
Shortage with Tank 3 Credit	132 gpm
Shortage with only Tank 2	**638 gpm**
Shortage with New Tank 2 having Equalization Storage	**132 gpm**

Maximum Day Demand Plus Equalization Storage and Any Source Out of Service (502.18)

Maximum Day Demand (Zone's 2 & 3)			1,282 gpm
Needed Equalization Storage	factor=	0.08	147,683 gal

Zone 2 Storage Tank Analysis (544.01&501.07) if Firm Well/Booster Pump Capacity = Max Day Demand

Operational Storage	30,000 gal	
Fire Flow Storage	180,000 gal	
Equalization Storage	147,683 gal	373,374
Standby Storage*	15,691 gal	-119,309
Dead Storage	0 gal	-15,691
Total	373,374 gal	238,374

Zone 2 Storage Tank Analysis (544.01&501.07) if Firm Well/Booster Pump Capacity = Peak Hour Demand

Operational Storage	25,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage	0 gal
Standby Storage	15,691 gal
Dead Storage	40,000 gal
Total	260,691 gal

Zone 2 Actual Tank 2 Analysis (544.01) if Firm Booster Pump Capacity = Peak Hour Demand

Operational Storage	25,000 gal	
Fire Flow Storage	119,309 gal	2nd Tank
Equalization Storage	0 gal	60,691
Standby Storage*	15,691 gal	147,683
Dead Storage	40,000 gal	-15,691
Total	200,000 gal	192,683

*Used wintertime averge daily flow in lieu of average daily flow

Emergency Operation Analysis (501.07)

Assumption: generators are used to compensate for shortage of fire flow storage

Additional Needed Flow Requirements At Booster Station(s) Supported by Generator

Fire Flow Shortage in Tank 2	60,691 gal	506 gpm
Average Wintertime Daily Flow Shortage in Tank 2	0 gal	0 gpm
Total	60,691 gal	506 gpm

Deficiencies Using Existing Tank 2 into the Future

- No equalization storage
- Insufficient fire flow storage so make up with booster pumping
- Need more booster station capacity for peak hour, max day and for fire fighting
- Insufficient fire flow capacity when power goes out so need generator

Options to Meet Requirements of 501.07, 544.01, 502.17 & 502.18

Max Day Firm Booster Pump Capacity Plus Fire, Equalization & Standby Storage

Build new Tank 2	**373,374 gal**
Drill new well serving Zone 2 and/or build new booster pump station	**132 gpm**

Peak Hour Firm Well/Booster Pump Capacity Plus Fire & Standby Storage

Build new Tank 2 or add more Storage at Tank 2 for Total Storage of	**260,691 gal**
Drill new well serving Zone 2 and/or build new booster pump station	**400 gpm**

Use Existing Tank

Drill new well serving Zone 2 and/or build new bps serving Zone 2	**638 gpm**
Install generator on Well 7/bps to Zone 2 producing atleast	**506 gpm**

Prepared by Schiess Associates, 4/4/2013

Page 2 Existing System Analysis @ 10 gpm/connection PHF with Improved BPS at Tank 2

(3) 40 Hp Pump Station next to Tank 2 (2 operating together)	1300 gpm	at 40 psi
(3) 40 Hp Pump Station next to Tank 2 (2 operating together)	1736 gpm	at 20 psi

Design of Zone 3 Tank 300,000 gal

Zones 3 Analysis w/Bigger Pumps at Tank 2 BPS & Zone 3&4 Tank Design and Zone 4 BPS Design

Peak Hour Demand With Any Source Out of Service Without Equalization Storage (502.17)	
Peak Hour Demand (zone 3 only)	240 gpm
Firm Booster Pump Capacity at 40 psi	1,300 gpm
Surplus	1,060 gpm

Maximum Day Demand Plus Fire Flow With Any Source Out of Service (502.18)		
Maximum Day Demand (Zone 3 only)	198 gpm	0 gpm
Fire Flow Demand	1,500 gpm	1,500
Total Demand	1,698 gpm	1,500
Firm Booster Pump Capacity at 20 psi	1,736 gpm	1,250
Tank 3 Credit for Fire Flow Storage	1,500 gpm	
Shortage without Tank 3	-38 gpm	250
Surplus with Tank 3	1,538 gpm	

Maximum Day Demand Plus Tank 3 Equalization Storage and Any Source Out of Service (502.18)	
Maximum Day Demand	198 gpm
Firm Booster Pump Capacity	943 gpm
Booster Pump Supply Surplus	745 gpm
Needed Zone 3 Equalization Storage at 0.08 factor	0 gal

Zone 4 Storage Tank Analysis (544.01&501.07) if Firm Booster Pump Capacity = Maximum Day Demand	
Operational Storage	30,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage (zone 4 equalization at 0.08 factor)	0 gal
Equalization Storage for Zone 3	0 gal
Standby Storage	2,430 gal
Dead Storage	0 gal
Total	212,430 gal

Zone 3 & 4 Storage Tank Analysis (544.01&501.07) if Firm Booster Pump Capacity = Peak Hour Demand	
Operational Storage	30,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage	0 gal
Standby Storage	2,430 gal
Dead Storage	0 gal
Total	212,430 gal

Emergency Operation Analysis (501.07): Average Day + Fire	
Zone 3 average day demand	5 gpm
Zone 3 fire flow requirement	1,500 gpm
Total demand	**1,505 gpm**
Firm booster pump contribution at Tank 2 (w/generator) at 20 psi	1,736 gpm
Shortage to be provided through PRPSV's from Zone 4	-231 gpm
Shortage to be provided through PRPSV's (w/o generator at Tank 2 BPS)	1,505 gpm

Zone 4 BPS Design - Peak Hour	
Zone 4 peak hour demand	0 gpm
Zone 3 peak hour demand shortage provided through PRPSV's	0 gpm
Total booster station requirement to Tank 3	0 gpm

Zone 4 BPS Design - Max Day	
Zone 4 peak max day demand	0 gpm
Zone 3 max day demand shortage provided through PRPSV's	0 gpm
Total booster station requirement to Tank 3	0 gpm

Emergency Operation Analysis (501.07) for Zone 4	
Zone 4 average day demand in winter	0 gpm
Zone 4 fire flow requirement	1,500 gpm
Total demand	1,500 gpm
Firm booster pump contribution from Big Bend BPS	0 gpm
Shortage to be provided from Tank 3 (w/o generator at Big Bend)	1,500 gpm

Options to Meet Requirements of 501.07, 544.01, 502.17 & 502.18

Max Day Firm Booster Pump Capacity Plus Fire, Equalization & Standby Storage	
Build new Tank 3	**212,430 gal**
Bring on-line Big Bend BPS	**0 gpm**

or

Peak Hour Firm Well/Booster Pump Capacity Plus Fire & Standby Storage	
Build new Tank 3	**212,430 gal**
Bring on-line Big Bend BPS	**0 gpm**

Page 2 Existing System Analysis @ 10 gpm/connection PHF with Tank 2 BPs As-is

Two 15 Hp pumps	240 gpm
One 15 Hp pump	150 gpm
	90 gpm

Maximum Day Demand Plus Fire Flow With Any Source Out of Service (502.18)	
Maximum Day Demand (Zone 3 only)	198 gpm
Fire Flow Demand	1,500 gpm
Total Demand	**1,698 gpm**
Firm Booster Pump Capacity at 20 psi	150 gpm
Shortage with only Tank 2	**1,548 gpm**

Zone 3 average day plus fire when the power goes out	
Zone 3 average day demand	5 gpm
Zone 3 fire flow requirement	1,500 gpm
Total demand	**1,505 gpm**
Firm booster pump contribution from existing booster pu	0 gpm
Shortage to be provided through PRPSV's from Zone 4	1,505 gpm
Shortage to be provided through PRPSV's w/o generator a	1,505 gpm

Comore Loma Water System

Existing System Analysis at 14.5 gpm/connection PHF

Metric	Overall	Zone 1	Zone 2	Zone 3	Zone 4
No. of Homes Being Served	320	165	131	24	0
Average Daily Flow, gpm	901	465	369	68	0
Maximum Day Flow, gpm	3,846	1983	1574	288	0
Max Day/Avg Day Ratio	4.3	4.3	4.3	4.3	#DIV/0!
Peak Hour Flow, gpm	4,650	2,398	1,904	349	0
Peak Hour/Avg Day Ratio	5.2	5.2	5.2	5.2	#DIV/0!
Averge Winter Day, gpm	67	35	28	5	0
Peak Hour/Maximum Day Ratio	1.2	1.2	1.2	1.2	1.2
Average Daily Flow/Connection, gpm	2.8				
Maximum Day Flow/Connection, gpm	12.0				
Peak Hour Flow/Connection, gpm	14.5				
Fire Flow Demand, gpm	1,500				
Fire Flow Storage, gal	180,000				

Well Capacity into Zone 1 Tank and Zone 2 Booster Stations

Well 2	200	gpm
Well 3	700	gpm
Well 4	750	gpm
Well 5	1,100	gpm
Well 6	1,500	gpm
Total	4,250	gpm

Overall System Analysis

Peak Hour Demand With Any Source Out of Service Without Equalization Storage (502.17)

Peak Hour Demand	4,650 gpm
Firm Well Capacity	2,750 gpm
Shortage	1,900 gpm

Maximum Day Demand Plus Fire Flow With Any Source Out of Service (502.18)

Maximum Day Demand	3,846 gpm
Fire Flow Demand	1,500 gpm
Total Demand	5,346 gpm
Firm Well Capacity	2,750 gpm
New Tank 1 Fire Flow Storage	1,500 gpm
Shortage	1,096 gpm

Equalization Storage

Maximum Day Demand			1,983 gpm
Needed Equalization Storage	factor=	0.22	628,228 gal
More refined calculation	factor=	0.08	223,891 gal

Zone 1 Storage Tank Need Analysis (544.01&501.07) if Firm Well Capacity = Maximum Day Demand

Operational Storage	33,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage	223,891 gal
Standby Storage*	16,703 gal
Dead Storage	0 gal
Total	453,594 gal

Zone 1 Storage Tank Need Analysis (544.01&501.07) if Firm Well Capacity = Peak Hour Demand

Operational Storage	25,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage	0 gal
Standby Storage	16,703 gal
Dead Storage	0 gal
Total	221,703 gal

Zone 1 Storage Tank Need Analysis (544.01&501.07) if Firm Well Capacity = Peak Hour Demand

Operational Storage	15,625 gal
Fire Flow Storage	67,672 gal
Equalization Storage	0 gal
Standby Storage	16,703 gal
Dead Storage	0 gal
Total	100,000 gal

Maximum Day Demand Plus Fire Flow With Any Source Out of Service using Existing Tank (502.18)

Maximum Day Demand	3,846 gpm
Fire Flow Demand	1,500 gpm
Total Demand	5,346 gpm
Firm Well Capacity	2,750 gpm
Tank 1 Fire Flow Storage	564 gpm
Shortage	2,032 gpm

*Used wintertime averge daily flow in lieu of average daily flow

Emergency Operation Analysis (501.07)

No generator needed, but advisable to get water into Tank 1 so it can be pumped up the hill.

Options to Meet Requirements of 501.07, 544.01, 502.17 & 502.18

Max Day Firm Well Pump Capacity Plus Fire, Equalization & Standby Storage

Build new Tank 1	**453,594 gal**
Drill new well(s)	**1,096 gpm**

or

Peak Hour Firm Well Pump Capacity Plus Fire & Standby Storage

Build new Tank 1 to have atleast a total Tank 1 storage of	**221,703 gal**
Drill new well(s)	**1,900 gpm**

Install generator on a well pump producing atleast	**936 gpm**

Keep Tank 1	**100,000 gpm**
Drill new well(s)	**2,032 gpm**

Cont. on Page 2

Zone 1-Zone 2 Firm Booster Pump Capacity

Middle Fork (3 of 4 Pumps)	1,020 gpm
Sagewood (1 of 2 Pump Sets)	130 gpm
Total	1,150 gpm

Zones 2, 3 & 4 Analysis

Peak Hour Demand With Any Source Out of Service Without Equalization Storage (502.17)

Peak Hour Demand	2,252 gpm
Firm Booster Pump Capacity	1,150 gpm
Shortage	1,102 gpm

Maximum Day Demand Plus Fire Flow With Any Source Out of Service (502.18)

Maximum Day Demand	1,863 gpm
Fire Flow Demand	1,500 gpm
Total Demand	3,363 gpm
Firm Booster Pump Capacity	1,150 gpm
Tank 2 Credit for Fire Flow Storage (119,309 gal/2hrs)	994 gpm
Tank 3 Credit for Fire Flow Storage	506 gpm
Shortage with Tank 3 Credit	713 gpm
Shortage with only Tank 2 Credit	**1,219 gpm**
Shortage with New Tank 2 having Equalization Storage	713 gpm

Maximum Day Demand Plus Equalization Storage and Any Source Out of Service (502.18)

Maximum Day Demand (Zone's 2 & 3)			1,863 gpm
Needed Equalization Storage	factor=	0.22	590,154 gal
More refined calculation	factor=	0.08	210,322 gal

Zone 2 Storage Tank Analysis (544.01&501.07) if Firm Well/Booster Pump Capacity = Maximum Day Demand

Operational Storage	30,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage	210,322 gal
Standby Storage	15,691 gal
Dead Storage	40,000 gal
Total	476,013 gal

Zone 2 Storage Tank Analysis (544.01&501.07) if Firm Well/Booster Pump Capacity = Peak Hour Demand

Operational Storage	25,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage	0 gal
Standby Storage	15,691 gal
Dead Storage	40,000 gal
Total	260,691 gal

Zone 2 Actual Tank 2 Analysis (544.01) if Firm Booster Pump Capacity = Peak Hour Demand

Operational Storage	25,000 gal
Fire Flow Storage	119,309 gal
Equalization Storage	0 gal
Standby Storage	15,691 gal
Dead Storage	40,000 gal
Total	200,000 gal

*Used wintertime averge daily flow in lieu of average daily flow

Emergency Operation Analysis (501.07)

Assumption: generators are used to compensate for shortage of fire flow storage

Additional Needed Flow Requirements At Booster Station(s) Supported by Generator

Fire Flow Shortage in Tank 2	60,691 gal	506 gpm
Average Wintertime Daily Flow Shortage in Tank 2	0 gal	0 gpm
Total	60,691 gal	506 gpm

Deficiencies Using Existing Tank 2 into the Future

No equalization storage

Insufficient fire flow storage so make up with booster pumping

Need more booster station capacity for peak hour, max day and for fire fighting

Insufficient fire flow capacity when power goes out so need generator

Options to Meet Requirements of 501.07, 544.01, 502.17 & 502.18

Max Day Firm Booster Pump Capacity Plus Fire, Equalization & Standby Storage

Build new Tank 2 (total Zone 2 storage)	**476,013 gal**
Drill new well serving Zone 2 and/or build new booster pump station	**713 gpm**

or

New Tank & Peak Hour Firm Well/Booster Pump Capacity Plus Fire & Standby Storage

Build additional storage for new Tank 2 for a total of	260,691 gal
Drill new well serving Zone 2 and/or build new booster pump station	1,102 gpm

or

Use Existing Tank

Booster Pump Capacity Max Day Flow + Plus Fire	**1,219 gpm**

and

Drill new well serving Zone 2 and/or build new booster pump station	**1,102 gpm**
Install generator on Well 7/BPS to Zone 2 producing atleast	**506 gpm**

Prepared by Schiess Associates, 4/4/2013

Page 2 - System Analysis at 14.5 gpm/connection PHF Including All Future Lots

Zone 2-Zone 3 Firm Booster Pump Capacity

(3) 40 Hp Pump Station next to Tank 2 (2 operating together)	1300 gpm	at 40 psi
(3) 40 Hp Pump Station next to Tank 2 (2 operating together)	1736 gpm	at 20 psi

Zones 3 Analysis w/Bigger Pumps at Tank 2 BPS & Zone 3&4 Tank Design and Zone 4 BPS Design

Peak Hour Demand With Any Source Out of Service Without Equalization Storage (502.17)

Peak Hour Demand (Zone 3 only)	349 gpm
Firm Booster Pump Capacity at 40 psi	1,300 gpm
Surplus	951 gpm

Maximum Day Demand Plus Fire Flow With Any Source Out of Service (502.18)

Maximum Day Demand (Zone 3 only)	288 gpm
Fire Flow Demand	1,500 gpm
Total Demand	**1,788 gpm**
Firm Booster Pump Capacity at 20 psi	1,736 gpm
Tank 3 Credit for Fire Flow Storage	1,500 gpm
Shortage without Tank 3	52 gpm
Surplus with Tank 3	1,448 gpm

Maximum Day Demand Plus Tank 3 Equalization Storage and Any Source Out of Service (502.18)

Maximum Day Demand	288 gpm
Firm Booster Pump Capacity at 40 psi	1,300 gpm
Booster Pump Supply Surplus	1,012 gpm
Needed Zone 3 Equalization Storage at 0.08 factor	116,531 gal

Zone 4 Storage Tank Analysis (544.01&501.07) if Firm Booster Pump Capacity = Maximum Day Demand

Operational Storage	25,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage (zone 4 equalization at 0.08 factor)	0 gal
Equalization Storage for Zone 3 if not provided in Tank 2	116,531 gal
Standby Storage	2,430 gal
Dead Storage	0 gal
Total	323,961 gal

Zone 3 & 4 Storage Tank Analysis (544.01&501.07) if Firm Booster Pump Capacity = Peak Hour Demand

Operational Storage	25,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage to Help Zone 3 if not provided in Tank 2	116,531 gal
Standby Storage	2,430 gal
Dead Storage	0 gal
Total	323,961 gal

Emergency Operation Analysis (501.07) for Zone 3

Zone 3 average day demand	5 gpm
Zone 3 fire flow requirement	1,500 gpm
Total demand	**1,505 gpm**
Firm booster pump contribution at Tank 2 (w/generator) at 20 psi	1,736 gpm
Shortage to be provided through PRPSV's from Zone 4	-231 gpm
Shortage to be provided through PRPSV's (w/o generator at Tank 2 BPS)	1,505 gpm

Zone 4 BPS Design - Peak Hour

Zone 4 peak hour demand	0 gpm
Zone 3 peak hour demand shortage provided through PRPSV's	951 gpm
Total booster station requirement to Tank 3	951 gpm

Zone 4 BPS Design - Max Day

Zone 4 peak max day demand	0 gpm
Zone 3 max day demand shortage provided through PRPSV's	1,012 gpm
Total booster station requirement to Tank 3	1,012 gpm

Emergency Operation Analysis (501.07) for Zone 4

Zone 4 average day demand in winter	0 gpm
Zone 4 fire flow requirement	1,500 gpm
Total demand	1,500 gpm
Firm booster pump contribution from Big Bend BPS (w/generator)	951 gpm
Shortage to be provided from Tank 3	549 gpm
Shortage to be provided by Tank 3 (w/o generator at Big Bend BPS)	1,500 gpm

Options to Meet Requirements of 501.07, 544.01, 502.17 & 502.18

Max Day Firm Booster Pump Capacity Plus Fire, Equalization & Standby Storage

Build new Tank 3	**323,961 gal**
Bring on-line Big Bend BPS	**1,012 gpm**

or

Peak Hour Firm Well/Booster Pump Capacity Plus Fire & Standby Storage

Build new Tank 3	**323,961 gal**
Bring on-line Big Bend BPS	**951 gpm**

Page 2 Existing System Analysis @ 14.5 gpm/connection As-is

Firm booster pump capacity	150 gpm

Peak Hour Demand With Any Source Out of Service Without Equalization Storage (502.17)

Peak Hour Demand (Zone 3 only)	349 gpm
Firm Booster Pump Capacity at 40 psi	150 gpm
Shortage	199 gpm

Maximum Day Demand Plus Fire Flow With Any Source Out of Service (502.18)

Maximum Day Demand (Zone 3 only)	288 gpm
Fire Flow Demand	1,500 gpm
Total Demand	**1,788 gpm**
Firm Booster Pump Capacity at 40 psi	150 gpm
Tank 3 Credit for Fire Flow Storage	0 gpm
Shortage without Tank 3	**1,638 gpm**

Zone 3 average day plus fire when the power goes out

Zone 3 average day demand (wintertime use only)	5 gpm
Zone 3 fire flow requirement	1,500 gpm
Total demand	**1,505 gpm**
Firm booster pump contribution from existing booster pumps at Tank 2 (w/generator)	150 gpm
Shortage to be provided through PRPSV's from Zone 4	1,355 gpm
Shortage to be provided through PRPSV's w/o generator at Tank 2 booster pumps	1,505 gpm

Calculated Demand Results Before and During Field Flow Tests

			Before Test Demand			During Test Demand			
No.	Item	Time	Tank Demand	From Pumps	Total Demand	Tank Demand	From Pumps	Total Demand	Hydrant Test Results
1	Rio Seco	12:24	-546	1800	1254	1340	1800	3140	1545
2	Comish	12:44	-560	1800	1240	422	1800	2222	1344
3	Sagewood Lower	1:02	-38	1800	1762	1481	200	1681	1007
4	Sagewood Middle	1:26	-138	1800	1662	-138	1800	1662	651
5	Sagewood Upper	1:43	-303	1800	1497	2300	0	2300	1387
6	Big Bend	2:04	-648	1800	1152	-148	1800	1652	1494
7	Middle Fork	2:22	-954	1800	846	2100	200	2300	1710
8	Sagewood Middle (2)	3:27	-205	1800	1595	-149	1800	1651	1108

All flows are gallons per minute

Positive numbers = System demand

Negative numbers = Filling the tank

Prepared by Schiess Associates, 10/18/2012

CALIBRATION RESULTS

	HYDRANT ID	FIELD PRESSURE (PSI)	MODEL PRESSURE (PSI)	ADJUSTED	DIFFERENCE	DEMAND FACTOR	PUMP CONDITIONS
1	RIO SECO	70.5	72.9	69.4	1.1	140%	WELL #6 & #2 ON, MF BOOSTERS ALL ON, SW OFF
2	COMISH	67	74.2	70.7	-3.7	140%	WELL #6 & #2 ON, MF BOOSTERS ALL ON, SW OFF
3	SAGEWOOD (LOWER)	79.6	89	85.5	-5.9	200%	WELL #6 OFF, #2 ON, MF BOOSTERS ALL ON, SW OFF
* 4	SAGEWOOD (MIDDLE)	27.1	24.8	21.3	5.8	180%	WELL #6 & #2 ON, MF BOOSTERS ALL ON, SW OFF
5	SAGEWOOD (UPPER)	50.4	55	51.5	-1.1	160%	ALL WELLS OFF, MF BOOSTERS ALL ON, SW OFF
6	BIG BEND	50.9	58.8	55.3	-4.4	130%	WELL #6 & #2 ON, MF BOOSTERS ALL ON, SW OFF
7	MIDDLE FORK	65.7	76.4	72.9	-7.2	65%	WELL # 2 ON, #6 OFF, MF BOOSTERS ALL ON, SW OFF
8	SAGEWOOD (MIDDLE)2	36.9	37.7	34.2	2.7	180%	WELL #6 & #2 ON, MF BOOSTERS ALL ON, SW ON

* This calibration is suspect due to reported incorrect line sizes and identification of a nearly closed valve on Sagewood between the calibration point and Tank 2.

Prepared by Schiess & Associates, October 10, 2012

WELL 6 OFF: QFIRE = 1500 GPM

Hydrant	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Junction																								
J-1																								
J-2																								
J-3																								
J-4																								
J-5																								
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J-42			0																					
J-43			16	9																				
J-44			14	7																				
J-45			7	12																				
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HYDRANT 3 MODEL RESULTS: QFIRE = 1500 GPM

Label	Elevation (ft)	Zone	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1	4,922.00	366: Zone - 1	0	5,112.60	82.5
J-2	4,928.00	366: Zone - 1	60.1	5,121.90	83.9
J-3	4,916.00	366: Zone - 1	24.03	5,126.40	91
J-4	4,915.00	366: Zone - 1	11.99	5,130.60	93.3
J-5	4,917.00	366: Zone - 1	36.07	5,132.90	93.4
J-6	4,892.40	366: Zone - 1	180.26	5,164.00	117.5
J-7	4,935.50	366: Zone - 1	60.1	5,164.00	98.8
J-8	4,945.50	366: Zone - 1	24.03	5,126.30	78.2
J-9	4,887.00	366: Zone - 1	24.03	5,130.40	105.3
J-10	4,950.50	366: Zone - 1	36.07	5,132.60	78.8
J-11	4,863.90	366: Zone - 1	48.06	5,165.30	130.4
J-12	4,928.50	366: Zone - 1	24.03	5,164.10	101.9
J-13	4,876.50	366: Zone - 1	36.07	5,164.00	124.4
J-14	4,929.50	366: Zone - 1	12.04	5,164.10	101.5
J-15	4,923.00	366: Zone - 1	36.07	5,164.10	104.3
J-16	4,938.00	366: Zone - 1	12.04	5,164.20	97.9
J-17	5,000.00	366: Zone - 1	48.06	5,164.10	71
J-18	4,941.00	366: Zone - 1	24.03	5,165.00	96.9
J-19	4,941.00	366: Zone - 1	12.04	5,163.30	96.2
J-20	4,841.60	366: Zone - 1	84.13	5,155.30	135.7
J-21	4,887.00	366: Zone - 1	84.13	5,164.00	119.8
J-22	4,927.30	366: Zone - 1	0	5,163.90	102.4
J-24	4,910.00	366: Zone - 1	24.03	5,163.00	109.5
J-26	4,878.00	366: Zone - 1	24.03	5,162.70	123.2
J-27	4,876.00	366: Zone - 1	0	5,162.70	124
J-28	4,823.00	366: Zone - 1	12.04	5,162.70	147
J-29	4,891.00	366: Zone - 1	60.1	5,162.50	117.4
J-30	4,813.00	366: Zone - 1	48.06	5,162.50	151.2
J-31	4,951.00	366: Zone - 1	84.13	5,162.50	91.5
J-32	4,969.10	366: Zone - 1	60.1	5,162.10	83.5
J-33	5,033.30	366: Zone - 1	48.06	5,161.80	55.6
J-34	5,025.50	366: Zone - 1	36.07	5,161.80	59
J-35	5,053.40	367: Zone - 2	0	5,161.80	46.9
J-36	5,060.40	367: Zone - 2	0	5,184.50	53.7
J-37	5,112.40	367: Zone - 2	120.2	5,184.50	31.2
J-38	5,084.40	367: Zone - 2	96.13	5,099.80	6.7
J-39	5,073.70	367: Zone - 2	48.06	5,099.80	11.3
J-40	5,055.10	367: Zone - 2	12.04	5,008.90	-20
J-41	5,007.50	367: Zone - 2	1,536.07	4,909.40	-42.5
J-42	5,059.30	367: Zone - 2	36.07	5,008.90	-21.8
J-43	5,111.50	367: Zone - 2	24.03	5,123.30	5.1
J-44	5,116.30	367: Zone - 2	36.07	5,123.30	3
J-45	5,166.00	367: Zone - 2	60.1	5,158.60	-3.2
J-46	5,170.00	367: Zone - 2	0	5,158.60	-4.9

J-47	5,166.00	367: Zone - 2	48.06	5,206.70	17.6
J-48	5,142.70	367: Zone - 2	24.03	5,206.70	27.7
J-49	5,172.00	367: Zone - 2	72.1	5,251.80	34.5
J-50	5,151.00	367: Zone - 2	84.13	5,227.70	33.2
J-51	5,171.00	367: Zone - 2	96.13	5,226.70	24.1
J-52	5,210.20	367: Zone - 2	108.17	5,310.30	43.3
J-53	5,199.10	367: Zone - 2	24.03	5,310.30	48.1
J-54	5,216.70	367: Zone - 2	0	5,317.00	43.4
J-55	5,217.00	367: Zone - 2	36.07	5,328.70	48.3
J-56	5,214.50	367: Zone - 2	48.06	5,330.70	50.3
J-57	5,223.00	367: Zone - 2	48.06	5,337.30	49.4
J-58	5,243.50	367: Zone - 2	60.1	5,347.20	44.9
J-59	5,016.50	366: Zone - 1	84.13	5,172.60	67.5
J-60	5,011.00	366: Zone - 1	72.1	5,176.80	71.7
J-61	4,985.00	366: Zone - 1	0	5,178.70	83.8
J-62	4,984.60	366: Zone - 1	0	5,178.70	84
J-63	5,049.00	367: Zone - 2	0	5,172.50	53.4
J-64	5,050.00	367: Zone - 2	0	5,294.10	105.6
J-65	5,079.30	367: Zone - 2	36.07	5,294.00	92.9
J-66	5,062.00	366: Zone - 1	36.07	5,176.80	49.6
J-67	5,063.30	366: Zone - 1	0	5,176.80	49.1
J-68	5,085.60	366: Zone - 1	0	5,176.80	39.4
J-69	5,086.70	366: Zone - 1	0	5,176.80	39
J-70	4,940.10	366: Zone - 1	36.07	5,164.00	96.9
J-71	5,048.60	366: Zone - 1	0	5,164.20	50
J-72	4,916.30	366: Zone - 1	24.03	5,163.10	106.8
J-73	5,181.20	367: Zone - 2	24.03	5,328.60	63.8
J-74	5,306.40	367: Zone - 2	0	5,354.10	20.7
J-75	5,337.50	367: Zone - 2	0	5,364.30	11.6
J-76	5,224.40	367: Zone - 2	36.07	5,347.90	53.4
J-80	5,302.40	368: Zone - 3	108.17	5,485.50	79.2
J-81	5,345.00	368: Zone - 3	24.03	5,489.90	62.7
J-82	5,151.40	367: Zone - 2	48.06	5,337.30	80.4
J-83	5,238.30	367: Zone - 2	0	5,349.60	48.2
J-84	5,249.00	367: Zone - 2	11.99	5,352.40	44.8
J-85	5,255.20	367: Zone - 2	48.06	5,354.90	43.1
J-86	5,343.70	368: Zone - 3	0	5,364.30	8.9
J-87	5,209.70	367: Zone - 2	0	5,349.60	60.5
J-88	5,267.40	367: Zone - 2	11.99	5,352.40	36.8
J-89	5,260.70	368: Zone - 3	0	5,489.90	99.1
J-90	5,293.00	368: Zone - 3	11.99	5,489.90	85.2
J-91	5,291.70	368: Zone - 3	0	5,366.30	32.3
J-92	5,345.50	368: Zone - 3	0	5,489.90	62.5
J-93	5,348.20	368: Zone - 3	11.99	5,489.90	61.3
J-94	5,260.60	368: Zone - 3	11.99	5,489.80	99.2
J-95	5,290.10	368: Zone - 3	0	5,366.30	33
J-96	5,292.50	368: Zone - 3	0	5,366.30	31.9

J-97	5,293.00	368: Zone - 3	0	5,366.30	31.7
J-98	5,293.20	368: Zone - 3	0	5,366.30	31.6
J-99	5,312.00	368: Zone - 3	0	5,489.90	77
J-100	5,259.70	367: Zone - 2	12.04	5,368.20	47
J-101	5,430.50	368: Zone - 3	11.99	5,427.60	-1.3
J-102	5,279.30	368: Zone - 3	24.03	5,489.80	91.1
J-103	5,266.70	367: Zone - 2	0	5,368.20	44
J-104	5,304.50	368: Zone - 3	24.03	5,489.80	80.2
J-105	5,277.90	368: Zone - 3	0	5,489.80	91.7
J-106	5,458.60	369: Zone - 4	0	5,427.60	-13.4
J-107	5,502.10	369: Zone - 4	0	5,427.60	-32.2
J-108	5,522.50	369: Zone - 4	0	5,427.60	-41.1
J-109	5,451.40	369: Zone - 4	0	5,427.60	-10.3
J-110	5,393.60	368: Zone - 3	0	5,489.80	41.6
J-111	5,403.00	368: Zone - 3	0	5,489.80	37.5
J-112	4,951.50	366: Zone - 1	0	5,144.40	83.5
J-113	4,952.30	366: Zone - 1	36.07	5,144.40	83.1
J-114	4,870.80	366: Zone - 1	60.1	5,141.40	117.1
J-115	4,943.20	366: Zone - 1	60.1	5,141.70	85.9
J-116	5,009.50	366: Zone - 1	120.2	5,126.60	50.7
J-117	5,201.20	367: Zone - 2	108.17	5,354.70	66.4
J-118	5,189.90	367: Zone - 2	0	5,354.70	71.3
J-119	5,008.50	366: Zone - 1	60.1	5,110.50	44.1
J-120	5,010.40	366: Zone - 1	12.04	5,110.20	43.2
J-121	5,010.90	366: Zone - 1	0	5,110.20	43
J-122	4,986.40	366: Zone - 1	12.04	5,108.20	52.7
J-123	5,045.00	366: Zone - 1	24.03	5,104.40	25.7
J-124	4,971.40	366: Zone - 1	12.04	5,108.20	59.2
J-125	5,045.60	367: Zone - 2	24.03	5,378.80	144.2
J-126	5,090.40	367: Zone - 2	24.03	5,374.80	123.1
J-127	5,138.20	367: Zone - 2	24.03	5,373.70	101.9
J-128	5,069.80	367: Zone - 2	48.06	5,374.60	131.9
J-130	4,986.00	366: Zone - 1	24.03	5,110.00	53.6
J-131	5,301.10	367: Zone - 2	0	5,368.20	29.1
J-132	5,301.10	368: Zone - 3	0	5,489.80	81.7
J-133	5,156.00	367: Zone - 2	0	5,368.20	91.8
J-134	5,270.00	368: Zone - 3	0	5,489.90	95.1
J-135	5,309.30	368: Zone - 3	60.1	5,487.60	77.2
J-138	4,879.00	366: Zone - 1	36.07	5,124.40	106.2
J-139	5,139.00	367: Zone - 2	0	5,373.70	101.6
J-140	5,356.50	367: Zone - 2	0	5,365.80	4
J-141	4,986.00	366: Zone - 1	0	5,164.20	77.1
J-142	4,924.10	366: Zone - 1	0	5,180.00	110.7
J-143	4,914.70	366: Zone - 1	0	5,125.40	91.1
J-144	4,914.70	366: Zone - 1	0	5,125.00	91
J-145	4,854.00	366: Zone - 1	0	5,175.50	139.1
J-146	4,986.00	366: Zone - 1	0	5,164.70	77.3

J-147	4,986.90	366: Zone - 1	0	5,179.00	83.1
J-148	4,897.40	366: Zone - 1	0	5,137.50	103.9
J-149	4,937.10	366: Zone - 1	0	5,133.50	85
J-150	4,888.70	366: Zone - 1	0	5,164.00	119.1
J-151	4,981.70	366: Zone - 1	0	5,164.10	78.9
J-152	4,881.00	366: Zone - 1	0	5,162.80	121.9
J-153	5,084.60	367: Zone - 2	0	5,184.50	43.2
J-154	5,157.30	367: Zone - 2	0	5,231.70	32.2
J-155	5,219.00	367: Zone - 2	0	5,324.30	45.5
J-156	5,223.00	367: Zone - 2	0	5,336.30	49
J-157	5,176.20	367: Zone - 2	0	5,368.20	83.1
J-158	5,196.70	367: Zone - 2	0	5,368.20	74.2
J-159	5,139.50	367: Zone - 2	0	5,373.00	101
J-160	5,185.10	367: Zone - 2	0.00	5,371.30	80.6
J-164	5,278.00	<None>	0	5,368.20	39

WELL 6 OFF: QFIRE = 250 GPM Summary

Hydrant	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
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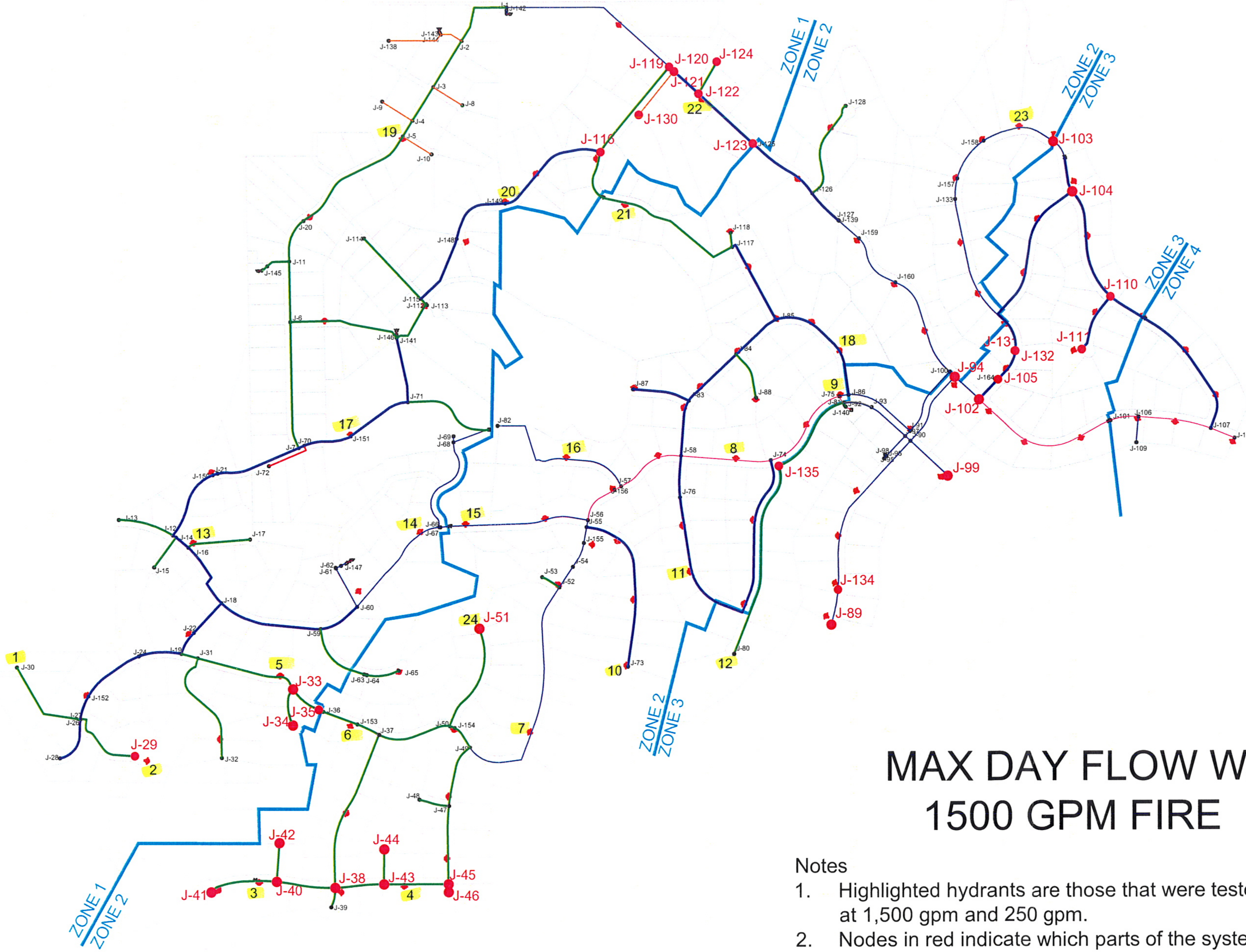
HYDRANT 3 MODEL RESULTS: QFIRE = 250 GPM

Label	Elevation (ft)	Zone	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1	4,922.00	366: Zone - 1	0	5,145.00	96.5
J-2	4,928.00	366: Zone - 1	60.1	5,159.90	100.4
J-3	4,916.00	366: Zone - 1	24.03	5,169.40	109.6
J-4	4,915.00	366: Zone - 1	11.99	5,177.60	113.6
J-5	4,917.00	366: Zone - 1	36.07	5,181.90	114.6
J-6	4,892.40	366: Zone - 1	180.26	5,237.40	149.3
J-7	4,935.50	366: Zone - 1	60.1	5,243.40	133.2
J-8	4,945.50	366: Zone - 1	24.03	5,169.30	96.8
J-9	4,887.00	366: Zone - 1	24.03	5,177.40	125.7
J-10	4,950.50	366: Zone - 1	36.07	5,181.50	100
J-11	4,863.90	366: Zone - 1	48.06	5,236.50	161.2
J-12	4,928.50	366: Zone - 1	24.03	5,259.40	143.1
J-13	4,876.50	366: Zone - 1	36.07	5,259.30	165.6
J-14	4,929.50	366: Zone - 1	12.04	5,259.80	142.9
J-15	4,923.00	366: Zone - 1	36.07	5,259.80	145.7
J-16	4,938.00	366: Zone - 1	12.04	5,261.90	140.2
J-17	5,000.00	366: Zone - 1	48.06	5,261.80	113.3
J-18	4,941.00	366: Zone - 1	24.03	5,272.20	143.3
J-19	4,941.00	366: Zone - 1	12.04	5,270.40	142.5
J-20	4,841.60	366: Zone - 1	84.13	5,220.30	163.9
J-21	4,887.00	366: Zone - 1	84.13	5,250.90	157.4
J-22	4,927.30	366: Zone - 1	0	5,271.10	148.8
J-24	4,910.00	366: Zone - 1	24.03	5,270.20	155.8
J-26	4,878.00	366: Zone - 1	24.03	5,269.90	169.5
J-27	4,876.00	366: Zone - 1	0	5,269.90	170.4
J-28	4,823.00	366: Zone - 1	12.04	5,269.90	193.3
J-29	4,891.00	366: Zone - 1	60.1	5,269.60	163.8
J-30	4,813.00	366: Zone - 1	48.06	5,269.70	197.6
J-31	4,951.00	366: Zone - 1	84.13	5,269.70	137.9
J-32	4,969.10	366: Zone - 1	60.1	5,269.30	129.9
J-33	5,033.30	366: Zone - 1	48.06	5,269.00	102
J-34	5,025.50	366: Zone - 1	36.07	5,269.00	105.3
J-35	5,053.40	367: Zone - 2	0	5,269.00	93.3
J-36	5,060.40	367: Zone - 2	0	5,302.90	104.9
J-37	5,112.40	367: Zone - 2	120.2	5,302.90	82.4
J-38	5,084.40	367: Zone - 2	96.13	5,294.40	90.8
J-39	5,073.70	367: Zone - 2	48.06	5,294.30	95.5
J-40	5,055.10	367: Zone - 2	12.04	5,289.30	101.3
J-41	5,007.50	367: Zone - 2	286.07	5,036.20	12.4
J-42	5,059.30	367: Zone - 2	36.07	5,289.20	99.5
J-43	5,111.50	367: Zone - 2	24.03	5,296.40	80
J-44	5,116.30	367: Zone - 2	36.07	5,296.30	77.9
J-45	5,166.00	367: Zone - 2	60.1	5,300.40	58.2
J-46	5,170.00	367: Zone - 2	0	5,300.40	56.4

J-47	5,166.00	367: Zone - 2	48.06	5,307.50	61.2
J-48	5,142.70	367: Zone - 2	24.03	5,307.50	71.3
J-49	5,172.00	367: Zone - 2	72.1	5,315.80	62.2
J-50	5,151.00	367: Zone - 2	84.13	5,309.90	68.7
J-51	5,171.00	367: Zone - 2	96.13	5,308.90	59.7
J-52	5,210.20	367: Zone - 2	108.17	5,329.40	51.6
J-53	5,199.10	367: Zone - 2	24.03	5,329.40	56.4
J-54	5,216.70	367: Zone - 2	0	5,331.20	49.5
J-55	5,217.00	367: Zone - 2	36.07	5,334.20	50.7
J-56	5,214.50	367: Zone - 2	48.06	5,334.80	52
J-57	5,223.00	367: Zone - 2	48.06	5,340.80	50.9
J-58	5,243.50	367: Zone - 2	60.1	5,349.70	46
J-59	5,016.50	366: Zone - 1	84.13	5,302.10	123.6
J-60	5,011.00	366: Zone - 1	72.1	5,316.40	132.1
J-61	4,985.00	366: Zone - 1	0	5,317.20	143.7
J-62	4,984.60	366: Zone - 1	0	5,317.20	143.9
J-63	5,049.00	367: Zone - 2	0	5,302.00	109.5
J-64	5,050.00	367: Zone - 2	0	5,423.60	161.6
J-65	5,079.30	367: Zone - 2	36.07	5,423.60	149
J-66	5,062.00	366: Zone - 1	36.07	5,323.60	113.2
J-67	5,063.30	366: Zone - 1	0	5,323.70	112.7
J-68	5,085.60	366: Zone - 1	0	5,323.60	103
J-69	5,086.70	366: Zone - 1	0	5,323.60	102.5
J-70	4,940.10	366: Zone - 1	36.07	5,243.20	131.1
J-71	5,048.60	366: Zone - 1	0	5,239.90	82.7
J-72	4,916.30	366: Zone - 1	24.03	5,242.30	141.1
J-73	5,181.20	367: Zone - 2	24.03	5,334.20	66.2
J-74	5,306.40	367: Zone - 2	0	5,356.10	21.5
J-75	5,337.50	367: Zone - 2	0	5,365.40	12.1
J-76	5,224.40	367: Zone - 2	36.07	5,350.40	54.5
J-80	5,302.40	368: Zone - 3	108.17	5,486.10	79.5
J-81	5,345.00	368: Zone - 3	24.03	5,490.50	62.9
J-82	5,151.40	367: Zone - 2	48.06	5,340.70	81.9
J-83	5,238.30	367: Zone - 2	0	5,351.90	49.2
J-84	5,249.00	367: Zone - 2	11.99	5,354.50	45.7
J-85	5,255.20	367: Zone - 2	48.06	5,356.80	43.9
J-86	5,343.70	368: Zone - 3	0	5,365.50	9.4
J-87	5,209.70	367: Zone - 2	0	5,351.90	61.5
J-88	5,267.40	367: Zone - 2	11.99	5,354.50	37.7
J-89	5,260.70	368: Zone - 3	0	5,490.40	99.4
J-90	5,293.00	368: Zone - 3	11.99	5,490.40	85.4
J-91	5,291.70	368: Zone - 3	0	5,370.00	33.9
J-92	5,345.50	368: Zone - 3	0	5,490.50	62.7
J-93	5,348.20	368: Zone - 3	11.99	5,490.40	61.5
J-94	5,260.60	368: Zone - 3	11.99	5,490.40	99.4
J-95	5,290.10	368: Zone - 3	0	5,370.00	34.5
J-96	5,292.50	368: Zone - 3	0	5,370.00	33.5

J-97	5,293.00	368: Zone - 3	0	5,370.00	33.3
J-98	5,293.20	368: Zone - 3	0	5,370.00	33.2
J-99	5,312.00	368: Zone - 3	0	5,490.40	77.2
J-100	5,259.70	367: Zone - 2	12.04	5,374.40	49.6
J-101	5,430.50	368: Zone - 3	11.99	5,427.60	-1.3
J-102	5,279.30	368: Zone - 3	24.03	5,490.40	91.3
J-103	5,266.70	367: Zone - 2	0	5,374.40	46.6
J-104	5,304.50	368: Zone - 3	24.03	5,490.30	80.4
J-105	5,277.90	368: Zone - 3	0	5,490.40	91.9
J-106	5,458.60	369: Zone - 4	0	5,427.60	-13.4
J-107	5,502.10	369: Zone - 4	0	5,427.60	-32.2
J-108	5,522.50	369: Zone - 4	0	5,427.60	-41.1
J-109	5,451.40	369: Zone - 4	0	5,427.60	-10.3
J-110	5,393.60	368: Zone - 3	0	5,490.30	41.9
J-111	5,403.00	368: Zone - 3	0	5,490.30	37.8
J-112	4,951.50	366: Zone - 1	0	5,205.80	110
J-113	4,952.30	366: Zone - 1	36.07	5,205.80	109.7
J-114	4,870.80	366: Zone - 1	60.1	5,201.10	142.9
J-115	4,943.20	366: Zone - 1	60.1	5,201.40	111.7
J-116	5,009.50	366: Zone - 1	120.2	5,174.20	71.3
J-117	5,201.20	367: Zone - 2	108.17	5,356.50	67.2
J-118	5,189.90	367: Zone - 2	0	5,356.50	72.1
J-119	5,008.50	366: Zone - 1	60.1	5,141.60	57.6
J-120	5,010.40	366: Zone - 1	12.04	5,141.10	56.6
J-121	5,010.90	366: Zone - 1	0	5,141.00	56.3
J-122	4,986.40	366: Zone - 1	12.04	5,137.30	65.2
J-123	5,045.00	366: Zone - 1	24.03	5,129.70	36.6
J-124	4,971.40	366: Zone - 1	12.04	5,137.20	71.7
J-125	5,045.60	367: Zone - 2	24.03	5,397.10	152.1
J-126	5,090.40	367: Zone - 2	24.03	5,389.20	129.3
J-127	5,138.20	367: Zone - 2	24.03	5,386.60	107.5
J-128	5,069.80	367: Zone - 2	48.06	5,389.00	138.1
J-130	4,986.00	366: Zone - 1	24.03	5,140.80	67
J-131	5,301.10	367: Zone - 2	0	5,374.40	31.7
J-132	5,301.10	368: Zone - 3	0	5,490.40	81.9
J-133	5,156.00	367: Zone - 2	0	5,374.40	94.5
J-134	5,270.00	368: Zone - 3	0	5,490.40	95.4
J-135	5,309.30	368: Zone - 3	60.1	5,488.20	77.4
J-138	4,879.00	366: Zone - 1	36.07	5,160.90	122
J-139	5,139.00	367: Zone - 2	0	5,386.60	107.1
J-140	5,356.50	367: Zone - 2	0	5,366.30	4.3
J-141	4,986.00	366: Zone - 1	0	5,238.00	109
J-142	4,924.10	366: Zone - 1	0	4,627.00	-128.5
J-143	4,914.70	366: Zone - 1	0	5,161.70	106.9
J-144	4,914.70	366: Zone - 1	0	5,161.50	106.8
J-145	4,854.00	366: Zone - 1	0	5,243.70	168.6
J-146	4,986.00	366: Zone - 1	0	5,238.40	109.2

J-147	4,986.90	366: Zone - 1	0	5,317.30	143
J-148	4,897.40	366: Zone - 1	0	5,193.90	128.3
J-149	4,937.10	366: Zone - 1	0	5,186.60	108
J-150	4,888.70	366: Zone - 1	0	5,251.50	157
J-151	4,981.70	366: Zone - 1	0	5,241.80	112.5
J-152	4,881.00	366: Zone - 1	0	5,270.00	168.3
J-153	5,084.60	367: Zone - 2	0	5,302.90	94.4
J-154	5,157.30	367: Zone - 2	0	5,310.90	66.4
J-155	5,219.00	367: Zone - 2	0	5,333.10	49.4
J-156	5,223.00	367: Zone - 2	0	5,339.90	50.6
J-157	5,176.20	367: Zone - 2	0	5,374.40	85.8
J-158	5,196.70	367: Zone - 2	0	5,374.40	76.9
J-159	5,139.50	367: Zone - 2	0	5,384.90	106.2
J-160	5,185.10	367: Zone - 2	0	5,381.10	84.80
J-164	5,278.00	<None>	0	5,374.40	41.7



MAX DAY FLOW W/ 1500 GPM FIRE

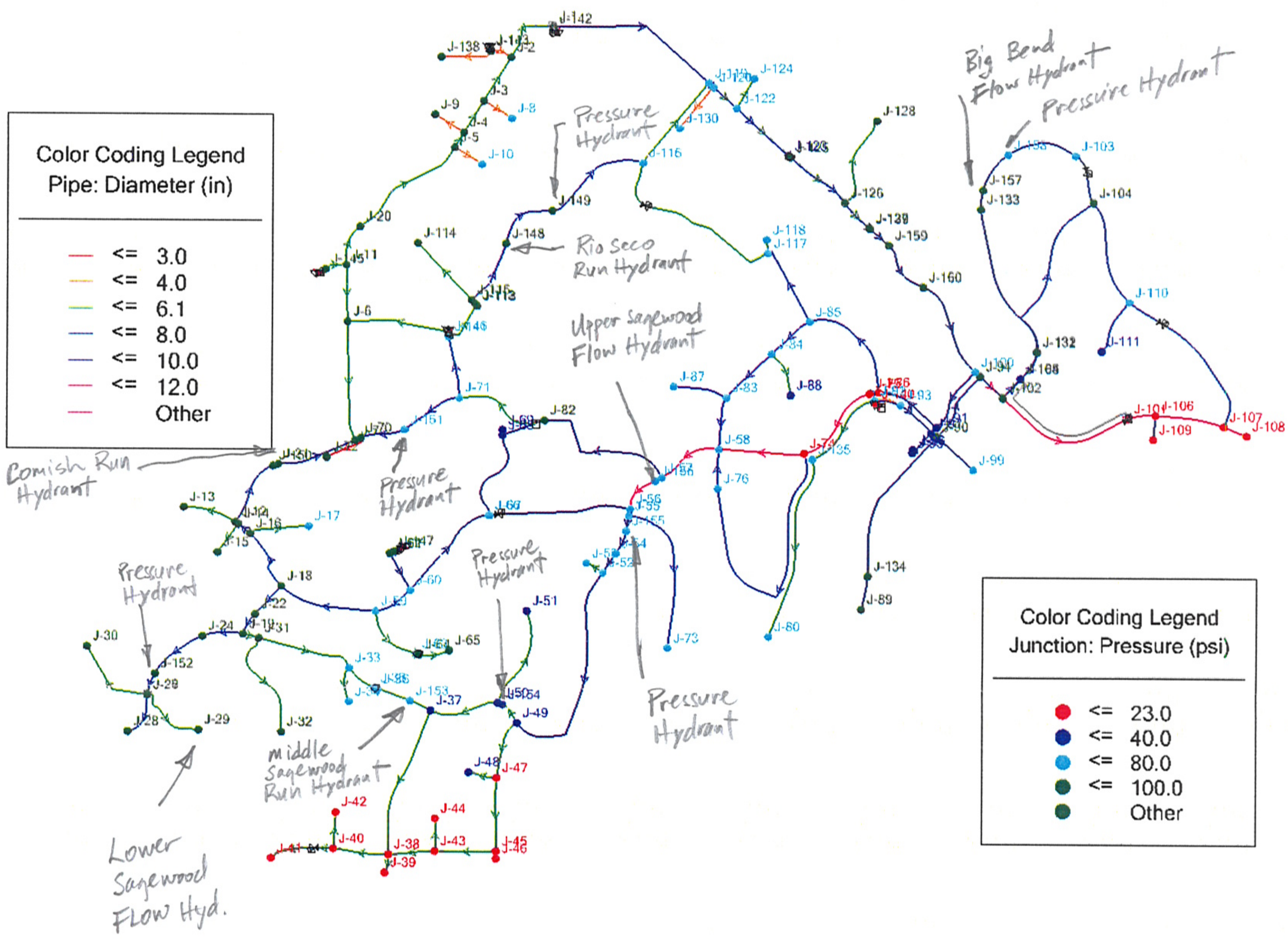
Notes

1. Highlighted hydrants are those that were tested for fire flow at 1,500 gpm and 250 gpm.
2. Nodes in red indicate which parts of the system cannot support a fire flow of 1,500 gpm.

Sample Output

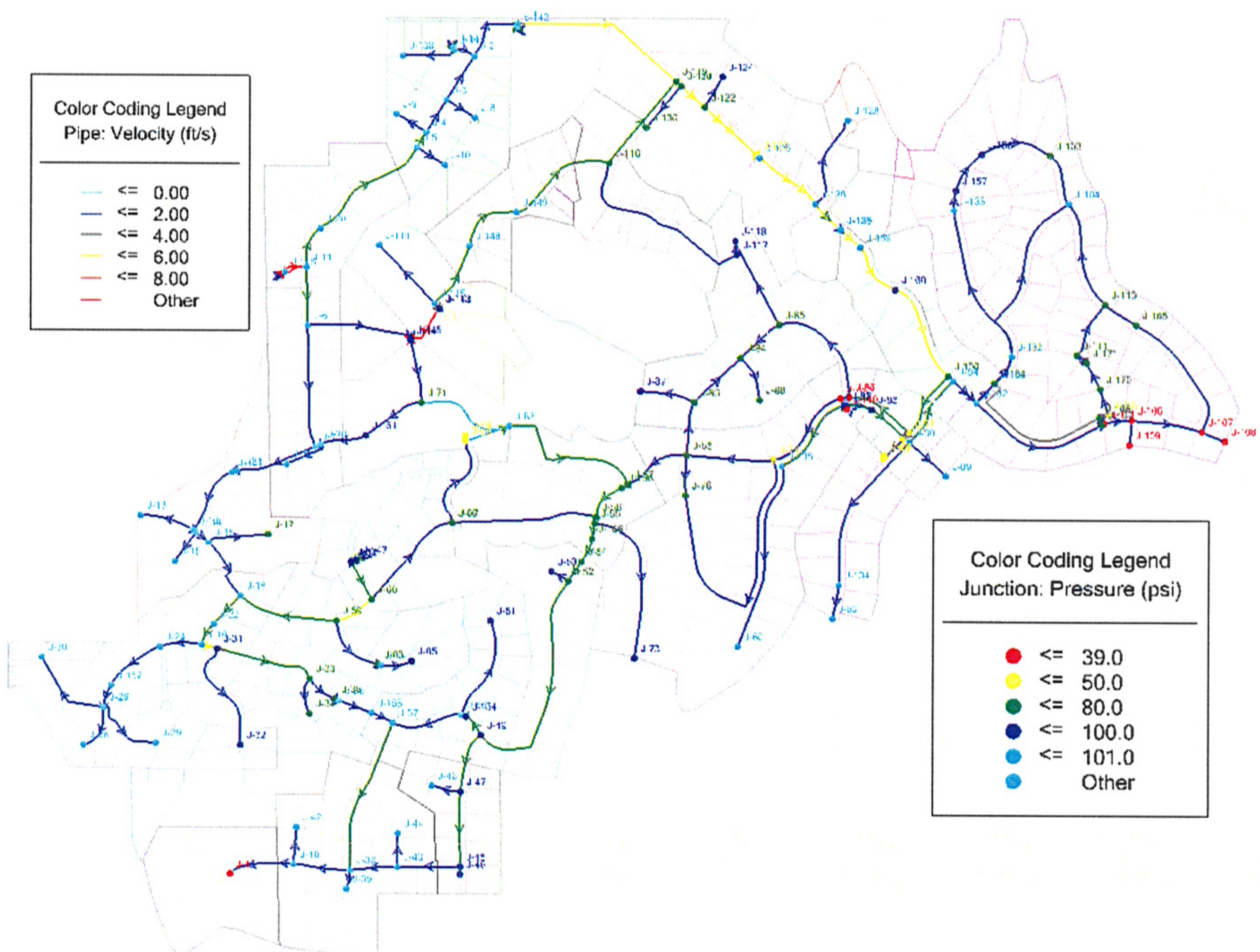
Scenario: HYD 3

Max Day + Fire Flow @ 1,500 gpm Fire Flow



Scenario: Peak Hour Flow

10 gpm / connection at Buildout



Comore Loma Water System

System Analysis at 14.5 gpm/connection Maximum Including All Future Lots

Metric	Overall	Zone 1	Zone 2	Zone 3	Zone 4
No. of Homes Being Served	320	165	131	24	0
No. of Future Homes	214	41	92	65	16
Total Homes	534	206	223	89	16
Average Daily Flow, gpm	1,504	580	628	251	45
Maximum Day Flow, gpm	6,418	2476	2680	1070	192
Max Day/Avg Day Ratio	4.3	4.3	4.3	4.3	4.3
Peak Hour Flow, gpm	7,760	2,993	3,240	1,293	233
Peak Hour/Avg Day Ratio	5.2	5.2	5.2	5.2	5.2
Averge Winter Day, gpm	113	43	47	19	3
Peak Hour/Maximum Day Ratio	1.2	1.2	1.2	1.2	1.2
Average Daily Flow/Connection, gpm	2.8				
Maximum Day Flow/Connection, gpm	12.0				
Peak Hour Flow/Connection, gpm	14.5				
Fire Flow Demand, gpm	1,500				
Fire Flow Storage, gal	180,000				

Well Capacity into Zone 1 Tank and Zone 2 Booster Stations

Well 2	200	gpm
Well 3	700	gpm
Well 4	750	gpm
Well 5	1,100	gpm
Well 6	1,500	gpm
Total	4,250	gpm

Overall System Analysis

Peak Hour Demand With Any Source Out of Service Without Equalization Storage (502.17)

Peak Hour Demand	7,760 gpm
Firm Well Capacity	2,750 gpm
Shortage	5,010 gpm

Maximum Day Demand Plus Fire Flow With Any Source Out of Service (502.18)

Maximum Day Demand	6,418 gpm
Fire Flow Demand	1,500 gpm
Total Demand	7,918 gpm
Firm Well Capacity	2,750 gpm
New Tank 1 Fire Flow Storage	1,500 gpm
Shortage	3,668 gpm

Equalization Storage

Maximum Day Demand			2,476 gpm
Needed Equalization Storage	factor=	0.22	784,333 gal
More refined calculation	factor=	0.08	279,524 gal

Zone 1 Storage Tank Need Analysis (544.01&501.07) if Firm Well Capacity = Maximum Day Demand

Operational Storage	33,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage	279,524 gal
Standby Storage*	20,854 gal
Dead Storage	0 gal
Total	513,378 gal

Zone 1 Storage Tank Need Analysis (544.01&501.07) if Firm Well Capacity = Peak Hour Demand

Operational Storage	25,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage	0 gal
Standby Storage	20,854 gal
Dead Storage	0 gal
Total	225,854 gal

*Used wintertime averge daily flow in lieu of average daily flow

Emergency Operation Analysis (501.07)

No generator needed, but advisable to get water into Tank 1 so it can be pumped up the hill.

Options to Meet Requirements of 501.07, 544.01, 502.17 & 502.18

Max Day Firm Well Pump Capacity Plus Fire, Equalization & Standby Storage

Build new Tank 1	**513,378 gal**
Drill new well(s)	**3,668 gpm**

or

Peak Hour Firm Well Pump Capacity Plus Fire & Standby Storage

Build new Tank 1 to have atleast a total Tank 1 storage of	**225,854 gal**
Drill new well(s)	**5,010 gpm**

Install generator on a well pump producing atleast **667 gpm**

Cont. on Page 2

Use same amount of water used per connection as now

Continue same use patterns

No change from 2011 policy (water three times per week)

Zone 1-Zone 2 Firm Booster Pump Capacity

Middle Fork (3 of 4 Pumps)	1,020 gpm
Sagewood (1 of 2 Pump Sets)	130 gpm
Total	1,150 gpm

Zones 2, 3 & 4 Analysis

Peak Hour Demand With Any Source Out of Service Without Equalization Storage (502.17)

Peak Hour Demand	4,766 gpm
Firm Booster Pump Capacity	1,150 gpm
Shortage	3,616 gpm

Maximum Day Demand Plus Fire Flow With Any Source Out of Service (502.18)

Maximum Day Demand	3,942 gpm
Fire Flow Demand	1,500 gpm
Total Demand	5,442 gpm
Firm Booster Pump Capacity	1,150 gpm
Tank 2 Credit for Fire Flow Storage (101,796 gal/2hrs)	848 gpm
Tank 3 Credit for Fire Flow Storage	652 gpm
Shortage with Tank 3 Credit	2,792 gpm
Shortage with only Tank 2 Credit	3,142 gpm
Shortage with New Tank 2 having Equalization Storage	2,792 gpm

Maximum Day Demand Plus Equalization Storage and Any Source Out of Service (502.18)

Maximum Day Demand (Zone's 2 & 3)			3,750 gpm
Needed Equalization Storage	factor=	0.22	1,187,922 gal
More refined calculation	factor=	0.08	423,357 gal

Zone 2 Storage Tank Analysis (544.01&501.07) if Firm Well/Booster Pump Capacity = Maximum Day Demand

Operational Storage	30,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage	423,357 gal
Standby Storage	33,204 gal
Dead Storage	40,000 gal
Total	706,562 gal

Zone 2 Storage Tank Analysis (544.01&501.07) if Firm Well/Booster Pump Capacity = Peak Hour Demand

Operational Storage	25,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage	0 gal
Standby Storage	33,204 gal
Dead Storage	40,000 gal
Total	278,204 gal

Zone 2 Actual Tank 2 Analysis (544.01) if Firm Booster Pump Capacity = Peak Hour Demand

Operational Storage	25,000 gal
Fire Flow Storage	101,796 gal
Equalization Storage	0 gal
Standby Storage	33,204 gal
Dead Storage	40,000 gal
Total	200,000 gal

*Used wintertime averge daily flow in lieu of average daily flow

Emergency Operation Analysis (501.07)

Assumption: generators are used to compensate for shortage of fire flow storage

Additional Needed Flow Requirements At Booster Station(s) Supported by Generator

Fire Flow Shortage in Tank 2	78,204 gal	652 gpm
Average Wintertime Daily Flow Shortage in Tank 2	0 gal	0 gpm
Total	78,204 gal	652 gpm

Deficiencies Using Existing Tank 2 into the Future

No equalization storage

Insufficient fire flow storage so make up with booster pumping

Need more booster station capacity for peak hour, max day and for fire fighting

Insufficient fire flow capacity when power goes out so need generator

Options to Meet Requirements of 501.07, 544.01, 502.17 & 502.18

Max Day Firm Booster Pump Capacity Plus Fire, Equalization & Standby Storage

Build new Tank 2	**706,562 gal**
Drill new well serving Zone 2 and/or build new booster pump station	**2,792 gpm**

or

New Tank & Peak Hour Firm Well/Booster Pump Capacity Plus Fire & Standby Storage

Build additional storage for new Tank 2 for a total of	278,204 gal
Drill new well serving Zone 2 and/or build new booster pump station	3,616 gpm

or

Use Existing Tank

Drill new well serving Zone 2 and/or build new booster pump station	**3,616 gpm**
Install generator on Well 7/BPS to Zone 2 producing atleast	**652 gpm**

Prepared by Schiess Associates, 4/4/2013

Page 2 - System Analysis at 14.5 gpm/connection Maximum Including All Future Lots

Zone 2-Zone 3 Firm Booster Pump Capacity		
(3) 40 Hp Pump Station next to Tank 2 (2 operating together)	1300 gpm	at 40 psi
(3) 40 Hp Pump Station next to Tank 2 (2 operating together)	1736 gpm	at 20 psi

Zone 3 Analysis w/Bigger Pumps at Tank 2 BPS & Zone 3&4 Tank Design and Zone 4 BPS Design

Peak Hour Demand With Any Source Out of Service Without Equalization Storage (502.17)		
Peak Hour Demand (Zone 3 only)		1,293 gpm
Firm Booster Pump Capacity at 40 psi	est.	1,300 gpm
Surplus		7 gpm

Maximum Day Demand Plus Fire Flow With Any Source Out of Service (502.18)	
Maximum Day Demand (Zone 3 only)	1,070 gpm
Fire Flow Demand	1,500 gpm
Total Demand	**2,570 gpm**
Firm Booster Pump Capacity at 20 psi	1,736 gpm
Tank 3 Credit for Fire Flow Storage	1,500 gpm
Shortage without Tank 3	**834 gpm**
Surplus with Tank 3	666 gpm

Maximum Day Demand Plus Tank 3 Equalization Storage and Any Source Out of Service (502.18)	
Maximum Day Demand	1,070 gpm
Firm Booster Pump Capacity at 40 psi	943 gpm
Booster Pump Supply Shortage	127 gpm
Needed Zone 3 Equalization Storage at 0.08 factor	14,589 gal

Zone 4 Storage Tank Analysis (544.01&501.07) if Firm Booster Pump Capacity = Maximum Day Demand	
Operational Storage	25,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage (zone 4 equalization at 0.08 factor)	22,152 gal
Equalization Storage for Zone 3	14,589 gal
Standby Storage	10,629 gal
Dead Storage	0 gal
Total	**252,371 gal**

Zone 3 & 4 Storage Tank Analysis (544.01&501.07) if Firm Booster Pump Capacity = Peak Hour Demand	
Operational Storage	25,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage to Help Zone 3	14,589 gal
Standby Storage	10,629 gal
Dead Storage	0 gal
Total	230,219 gal

Emergency Operation Analysis (501.07) for Zone 3	
Zone 3 average day demand	19 gpm
Zone 3 fire flow requirement	1,500 gpm
Total demand	**1,519 gpm**
Firm booster pump contribution at Tank 2 (w/generator) at 20 psi	1,736 gpm
Shortage to be provided through PRPSV's from Zone 4	-217 gpm
Shortage to be provided through PRPSV's (w/o generator at Tank 2 BPS)	1,519 gpm

Zone 4 BPS Design - Peak Hour	
Zone 4 peak hour demand	233 gpm
Zone 3 peak hour demand shortage provided through PRPSV's	7 gpm
Total booster station requirement to Tank 3	239 gpm

Zone 4 BPS Design - Max Day	
Zone 4 peak max day demand	192 gpm
Zone 3 max day demand shortage provided through PRPSV's	127 gpm
Total booster station requirement to Tank 3	**319 gpm**

Emergency Operation Analysis (501.07) for Zone 4	
Zone 4 average day demand in winter	3 gpm
Zone 4 fire flow requirement	1,500 gpm
Total demand	1,503 gpm
Firm booster pump contribution from Big Bend BPS (w/generator)	239 gpm
Shortage to be provided from Tank 3	1,264 gpm
Shortage to be provided by Tank 3 (w/o generator at Big Bend BPS)	1,503 gpm

Options to Meet Requirements of 501.07, 544.01, 502.17 & 502.18

Max Day Firm Booster Pump Capacity Plus Fire, Equalization & Standby Storage

Build new Tank 3	**252,371 gal**
Bring on-line Big Bend BPS	**319 gpm**

or

Peak Hour Firm Well/Booster Pump Capacity Plus Fire & Standby Storage

Build new Tank 3	**230,219 gal**
Bring on-line Big Bend BPS	**239 gpm**

Prepared by Schiess Associates, 4/4/2013

Comore Loma Water System

System Analysis at 12 gpm/connection Maximum Including All Future Lots

Metric	Overall	Zone 1	Zone 2	Zone 3	Zone 4
No. of Homes Being Served	320	165	131	24	0
No. of Future Homes	214	41	92	65	16
Total Homes	534	206	223	89	16
Average Daily Flow, gpm	1,504	580	628	251	45
Maximum Day Flow, gpm	5,300	2045	2213	883	159
Max Day/Avg Day Ratio	3.5	3.5	3.5	3.5	3.5
Peak Hour Flow, gpm	6,408	2,472	2,676	1,068	192
Peak Hour/Avg Day Ratio	4.3	4.3	4.3	4.3	4.3
Averge Winter Day, gpm	113	43	47	19	3
Peak Hour/Maximum Day Ratio	1.2	1.2	1.2	1.2	1.2
Average Daily Flow/Connection, gpm	2.8				
Maximum Day Flow/Connection, gpm	9.9				
Peak Hour Flow/Connection, gpm	12.0				
Fire Flow Demand, gpm	1,500				
Fire Flow Storage, gal	180,000				

Use same amount of water per connection as now
Make changes with policy (water two times per week for longer period)
This aims to reduce max day by 16.7% and spread use out more evenly throughout the day
This aims to reduce water use at peak hour by 17.2%

Well Capacity into Zone 1 Tank and Zone 2 Booster Stations

Well 2	200	gpm
Well 3	700	gpm
Well 4	750	gpm
Well 5	1,100	gpm
Well 6	1,500	gpm
Total	4,250	gpm

Zone 1-Zone 2 Firm Booster Pump Capacity

Middle Fork (3 of 4 Pumps)	1,020 gpm
Sagewood (1 of 2 Pump Sets)	130 gpm
Total	1,150 gpm

Overall System Analysis

Peak Hour Demand With Any Source Out of Service Without Equalization Storage (502.17)

Peak Hour Demand	6,408 gpm
Firm Well Capacity	2,750 gpm
Shortage	3,658 gpm

Maximum Day Demand Plus Fire Flow With Any Source Out of Service (502.18)

Maximum Day Demand	5,300 gpm
Fire Flow Demand	1,500 gpm
Total Demand	6,800 gpm
Firm Well Capacity	2,750 gpm
Tank 1 Fire Flow Storage	1,500 gpm
Shortage	2,550 gpm

Maximum Day Demand Plus Equalization Storage and Any Source Out of Service (502.17)

Maximum Day Demand			2,045 gpm
Needed Equalization Storage	factor=	0.08	235,530 gal

Zone 1 Storage Tank Need Analysis (544.01&501.07) if Firm Well Capacity = Maximum Day Demand

Operational Storage	25,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage	235,530 gal
Standby Storage*	20,854 gal
Dead Storage	0 gal
Total	461,384 gal

Zone 1 Storage Tank Need Analysis (544.01&501.07) if Firm Well Capacity = Peak Hour Demand

Operational Storage	25,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage	0 gal
Standby Storage*	20,854 gal
Dead Storage	0 gal
Total	225,854 gal

*Used wintertime averge daily flow in lieu of average daily flow

Emergency Operation Analysis (501.07)
No generator needed, but advisable to get water into Tank 1 so it can be pumped up the hill.

Options to Meet Requirements of 501.07, 544.01, 502.17 & 502.18
Max Day Firm Well Pump Capacity Plus Fire, Equalization & Standby Storage

Build new Tank 1	**461,384 gal**
Drill new well(s)	**2,550 gpm**

or
Peak Hour Firm Well Pump Capacity Plus Fire & Standby Storage

Build new Tank 1	**225,854 gal**
Drill new well(s)	**3,658 gpm**

Continued on page 2

Zones 2, 3 & 4 Analysis

Peak Hour Demand With Any Source Out of Service Without Equalization Storage (502.17)

Peak Hour Demand	3,936 gpm
Firm Booster Pump Capacity	1,150 gpm
Shortage	**2,786 gpm**

Maximum Day Demand Plus Fire Flow With Any Source Out of Service (502.18)

Maximum Day Demand	3,255 gpm
Fire Flow Demand	1,500 gpm
Total Demand	4,755 gpm
Firm Booster Pump Capacity	1,150 gpm
Tank 2 Credit for Fire Flow Storage (101,796 gal/2hrs)	848 gpm
Tank 3 Credit for Fire Flow Storage	652 gpm
Shortage with Tank 3 Credit	2,105 gpm
Shortage with only Tank 2	**2,757 gpm**
Shortage with New Tank 2 having Equalization Storage	**2,105 gpm**

Maximum Day Demand Plus Equalization Storage and Any Source Out of Service (502.18)

Maximum Day Demand (Zone's 2 & 3)			3,097 gpm
Needed Equalization Storage	factor=	0.08	356,725 gal

Zone 2 Storage Tank Analysis (544.01&501.07) if Firm Well/Booster Pump Capacity = Max Day Demand

Operational Storage	30,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage	356,725 gal
Standby Storage	33,204 gal
Dead Storage	0 gal
Total	599,930 gal

Zone 2 Storage Tank Analysis (544.01&501.07) if Firm Well/Booster Pump Capacity = Peak Hour Demand

Operational Storage	25,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage	0 gal
Standby Storage	33,204 gal
Dead Storage	40,000 gal
Total	278,204 gal

Zone 2 Actual Tank 2 Analysis (544.01) if Firm Booster Pump Capacity = Peak Hour Demand

Operational Storage	25,000 gal	
Fire Flow Storage	101,796 gal	2nd Tank
Equalization Storage	0 gal	78,204
Standby Storage	33,204 gal	356,725
Dead Storage	40,000 gal	-33,204
Total	200,000 gal	401,725

*Used wintertime averge daily flow in lieu of average daily flow

Emergency Operation Analysis (501.07)
Assumption: generators are used to compensate for shortage of fire flow storage
Additional Needed Flow Requirements At Booster Station(s) Supported by Generator

Fire Flow Shortage in Tank 2	78,204 gal	652 gpm
Average Wintertime Daily Flow Shortage in Tank 2	0 gal	0 gpm
Total	78,204 gal	652 gpm

Deficiencies Using Existing Tank 2 into the Future
No equalization storage
Insufficient fire flow storage so make up with booster pumping
Need more booster station capacity for peak hour, max day and for fire fighting
Insufficient fire flow capacity when power goes out so need generator

Options to Meet Requirements of 501.07, 544.01, 502.17 & 502.18
Max Day Firm Booster Pump Capacity Plus Fire, Equalization & Standby Storage

Build new Tank 2	**599,930 gal**
Drill new well serving Zone 2 and/or build new booster pump station	**2,105 gpm**

Peak Hour Firm Well/Booster Pump Capacity Plus Fire & Standby Storage

Build new Tank 2 or add more Storage at Tank 2 for Total Storage of	278,204 gal
Drill new well serving Zone 2 and/or build new booster pump station	2,786 gpm

Use Existing Tank

Drill new well serving Zone 2 and/or build new bps serving Zone 2	**2,786 gpm**
Install generator on Well 7/bps to Zone 2 producing atleast	**652 gpm**

Page 2 - System Analysis at 12 gpm/connection Maximum Including All Future Lots

(3) 40 Hp Pump Station next to Tank 2 (2 operating together)	1300 gpm	at 40 psi
(3) 40 Hp Pump Station next to Tank 2 (2 operating together)	1736 gpm	at 20 psi

Zones 3 Analysis w/Bigger Pumps at Tank 2 BPS & Zone 3&4 Tank Design and Zone 4 BPS Design

Peak Hour Demand With Any Source Out of Service Without Equalization Storage (502.17)		
Peak Hour Demand (zone 3 only)	1,068 gpm	
Firm Booster Pump Capacity at 40 psi	**1,300 gpm**	
Shortage	-232 gpm	

Maximum Day Demand Plus Fire Flow With Any Source Out of Service (502.18)		
Maximum Day Demand (Zone 3 only)	883 gpm	288 gpm
Fire Flow Demand	1,500 gpm	1,500
Total Demand	**2,383 gpm**	1,788
Firm Booster Pump Capacity at 20 psi	1,736 gpm	1,250
Tank 3 Credit for Fire Flow Storage	1,500 gpm	
Shortage without Tank 3	**647 gpm**	**538**
Surplus with Tank 3	853 gpm	

Maximum Day Demand Plus Tank 3 Equalization Storage and Any Source Out of Service (502.18)	
Maximum Day Demand	883 gpm
Firm Booster Pump Capacity	943 gpm
Booster Pump Supply Surplus	60 gpm
Needed Zone 3 Equalization Storage at 0.08 factor	0 gal

Zone 4 Storage Tank Analysis (544.01&501.07) if Firm Booster Pump Capacity = Maximum Day Demand	
Operational Storage	30,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage (zone 4 equalization at 0.08 factor)	18,294 gal
Equalization Storage for Zone 3	0 gal
Standby Storage	10,629 gal
Dead Storage	0 gal
Total	**238,923 gal**

Zone 3 & 4 Storage Tank Analysis (544.01&501.07) if Firm Booster Pump Capacity = Peak Hour Demand	
Operational Storage	30,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage	0 gal
Standby Storage	10,629 gal
Dead Storage	0 gal
Total	**220,629 gal**

Emergency Operation Analysis (501.07): Average Day + Fire	
Zone 3 average day demand	19 gpm
Zone 3 fire flow requirement	1,500 gpm
Total demand	**1,519 gpm**
Firm booster pump contribution at Tank 2 (w/generator) at 20 psi	1,736 gpm
Shortage to be provided through PRPSV's from Zone 4	-217 gpm
Shortage to be provided through PRPSV's (w/o generator at Tank 2 BPS)	1,519 gpm

Zone 4 BPS Design - Peak Hour	
Zone 4 peak hour demand	192 gpm
Zone 3 peak hour demand shortage provided through PRPSV's	0 gpm
Total booster station requirement to Tank 3	**192 gpm**

Zone 4 BPS Design - Max Day	
Zone 4 peak max day demand	159 gpm
Zone 3 max day demand shortage provided through PRPSV's	0 gpm
Total booster station requirement to Tank 3	**159 gpm**

Emergency Operation Analysis (501.07) for Zone 4	
Zone 4 average day demand in winter	3 gpm
Zone 4 fire flow requirement	1,500 gpm
Total demand	1,503 gpm
Firm booster pump contribution from Big Bend BPS	0 gpm
Shortage to be provided from Tank 3 (w/o generator at Big Bend)	1,503 gpm

Options to Meet Requirements of 501.07, 544.01, 502.17 & 502.18

Max Day Firm Booster Pump Capacity Plus Fire, Equalization & Standby Storage

Build new Tank 3	**238,923 gal**
Bring on-line Big Bend BPS	**159 gpm**

or

Maximum Day Demand Plus Fire Flow With Any Source Out of Service (502.18) + No Tank

Total Demand	**2,383 gpm**

and

Peak Hour Demand and Tank Capacity without Equalization Storage

Build new Tank 3	**220,629 gal**
Bring on-line Big Bend BPS	**192 gpm**

Comore Loma Water System

System Analysis at 10 gpm/connection Maximum Including All Future Lots

Metric	Overall	Zone 1	Zone 2	Zone 3	Zone 4
No. of Homes Being Served	320	165	131	24	0
No. of Future Homes	214	41	92	65	16
Total Homes	534	206	223	89	16
Average Daily Flow, gpm	1,253	484	523	209	38
Maximum Day Flow, gpm	4,417	1704	1844	736	132
Max Day/Avg Day Ratio	3.5	3.5	3.5	3.5	3.5
Peak Hour Flow, gpm	5,340	2,060	2,230	890	160
Peak Hour/Avg Day Ratio	4.3	4.3	4.3	4.3	4.3
Averge Winter Day, gpm	113	43	47	19	3
Peak Hour/Maximum Day Ratio	1.2	1.2	1.2	1.2	1.2
Average Daily Flow/Connection, gpm	2.3				
Maximum Day Flow/Connection, gpm	8.3				
Peak Hour Flow/Connection, gpm	10.0				
Fire Flow Demand, gpm	1,500				
Fire Flow Storage, gal	180,000				

Use 17.9% less water per home annually
Use 31% less water on the max day of the year
Reduce peak hour flow by 45%

Well Capacity into Zone 1 Tank and Zone 2 Booster Stations

Well 2	200	gpm
Well 3	700	gpm
Well 4	750	gpm
Well 5	1,100	gpm
Well 6	1,500	gpm
Total	4,250	gpm

Overall System Analysis

Peak Hour Demand With Any Source Out of Service Without Equalization Storage (502.17)

Peak Hour Demand	5,340 gpm
Firm Well Capacity	2,750 gpm
Shortage	2,590 gpm

Maximum Day Demand Plus Fire Flow With Any Source Out of Service (502.18)

Maximum Day Demand	4,417 gpm
Fire Flow Demand	1,500 gpm
Total Demand	5,917 gpm
Firm Well Capacity	2,750 gpm
Tank 1 Fire Flow Storage	1,500 gpm
Shortage	1,667 gpm

Maximum Day Demand Plus Equalization Storage and Any Source Out of Service (502.17)

Maximum Day Demand			1,704 gpm
Needed Equalization Storage	factor=	0.08	196,275 gal

Zone 1 Storage Tank Need Analysis (544.01&501.07) if Firm Well Capacity = Maximum Day Demand

Operational Storage	25,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage	196,275 gal
Standby Storage*	20,854 gal
Dead Storage	0 gal
Total	422,129 gal

Zone 1 Storage Tank Need Analysis (544.01&501.07) if Firm Well Capacity = Peak Hour Demand

Operational Storage	25,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage	0 gal
Standby Storage*	20,854 gal
Dead Storage	0 gal
Total	225,854 gal

*Used wintertime averge daily flow in lieu of average daily flow

Emergency Operation Analysis (501.07)
No generator needed, but advisable to get water into Tank 1 so it can be pumped up the hill.

Options to Meet Requirements of 501.07, 544.01, 502.17 & 502.18
Max Day Firm Well Pump Capacity Plus Fire, Equalization & Standby Storage

Build new Tank 1	**422,129 gal**
Drill new well(s)	**1,667 gpm**

or
Peak Hour Firm Well Pump Capacity Plus Fire & Standby Storage

Build new Tank 1	**225,854 gal**
Drill new well(s)	**2,590 gpm**

Continued on page 2

Zone 1-Zone 2 Firm Booster Pump Capacity

Middle Fork (3 of 4 Pumps)	1,020 gpm
Sagewood (1 of 2 Pump Sets)	130 gpm
Total	1,150 gpm

Zones 2, 3 & 4 Analysis

Peak Hour Demand With Any Source Out of Service Without Equalization Storage (502.17)

Peak Hour Demand	3,280 gpm
Firm Booster Pump Capacity	1,150 gpm
Shortage	**2,130 gpm**

Maximum Day Demand Plus Fire Flow With Any Source Out of Service (502.18)

Maximum Day Demand	2,713 gpm
Fire Flow Demand	1,500 gpm
Total Demand	4,213 gpm
Firm Booster Pump Capacity	1,150 gpm
Tank 2 Credit for Fire Flow Storage (101,796 gal/2hrs)	848 gpm
Tank 3 Credit for Fire Flow Storage	652 gpm
Shortage with Tank 3 Credit	1,563 gpm
Shortage with only Tank 2	**2,215 gpm**
Shortage with New Tank 2 having Equalization Storage	**1,563 gpm**

Maximum Day Demand Plus Equalization Storage and Any Source Out of Service (502.18)

Maximum Day Demand (Zone's 2 & 3)			2,580 gpm
Needed Equalization Storage	factor=	0.08	297,271 gal

Zone 2 Storage Tank Analysis (544.01&501.07) if Firm Well/Booster Pump Capacity = Max Day Demand

Operational Storage	30,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage	297,271 gal
Standby Storage*	33,204 gal
Dead Storage	0 gal
Total	540,475 gal

Zone 2 Storage Tank Analysis (544.01&501.07) if Firm Well/Booster Pump Capacity = Peak Hour Demand

Operational Storage	25,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage	0 gal
Standby Storage	33,204 gal
Dead Storage	40,000 gal
Total	278,204 gal

Zone 2 Actual Tank 2 Analysis (544.01) if Firm Booster Pump Capacity = Peak Hour Demand

Operational Storage	25,000 gal	
Fire Flow Storage	101,796 gal	2nd Tank
Equalization Storage	0 gal	78,204
Standby Storage*	33,204 gal	297,271
Dead Storage	40,000 gal	-33,204
Total	200,000 gal	342,270

*Used wintertime averge daily flow in lieu of average daily flow

Emergency Operation Analysis (501.07)
Assumption: generators are used to compensate for shortage of fire flow storage
Additional Needed Flow Requirements At Booster Station(s) Supported by Generator

Fire Flow Shortage in Tank 2	78,204 gal	652 gpm
Average Wintertime Daily Flow Shortage in Tank 2	0 gal	0 gpm
Total	78,204 gal	652 gpm

Deficiencies Using Existing Tank 2 into the Future
No equalization storage
Insufficient fire flow storage so make up with booster pumping
Need more booster station capacity for peak hour, max day and for fire fighting
Insufficient fire flow capacity when power goes out so need generator

Options to Meet Requirements of 501.07, 544.01, 502.17 & 502.18
Max Day Firm Booster Pump Capacity Plus Fire, Equalization & Standby Storage

Build new Tank 2	**540,475 gal**
Drill new well serving Zone 2 and/or build new booster pump station	**1,563 gpm**

Peak Hour Firm Well/Booster Pump Capacity Plus Fire & Standby Storage

Build new Tank 2 or add more Storage at Tank 2 for Total Storage of	278,204 gal
Drill new well serving Zone 2 and/or build new booster pump station	2,130 gpm

Use Existing Tank

Drill new well serving Zone 2 and/or build new bps serving Zone 2	**2,215 gpm**
Install generator on Well 7/bps to Zone 2 producing atleast	**652 gpm**

Upgrade to Tank 2 BPS

(3) 40 Hp Pump Station next to Tank 2 (2 operating together)	1300 gpm	at 40 psi
(3) 40 Hp Pump Station next to Tank 2 (2 operating together)	1736 gpm	at 20 psi

Zones 3 Analysis w/Bigger Pumps at Tank 2 BPS & Zone 3&4 Tank Design and Zone 4 BPS Design

Peak Hour Demand With Any Source Out of Service Without Equalization Storage (502.17)	
Peak Hour Demand (zone 3 only)	890 gpm
Firm Booster Pump Capacity at 40 psi	**1,300 gpm**
Surplus	410 gpm

Maximum Day Demand Plus Fire Flow With Any Source Out of Service (502.18)		
Maximum Day Demand (Zone 3 only)	736 gpm	240 gpm
Fire Flow Demand	1,500 gpm	1,500
Total Demand	2,236 gpm	1,740
Firm Booster Pump Capacity at 20 psi	1,736 gpm	1,250
Tank 3 Credit for Fire Flow Storage	1,500 gpm	
Shortage without Tank 3	**500 gpm**	**490**
Surplus with Tank 3	1,000 gpm	

Maximum Day Demand Plus Tank 3 Equalization Storage and Any Source Out of Service (502.18)	
Maximum Day Demand	736 gpm
Firm Booster Pump Capacity	1,300 gpm
Booster Pump Supply Surplus	564 gpm
Needed Zone 3 Equalization Storage at 0.08 factor	0 gal

Zone 4 Storage Tank Analysis (544.01&501.07) if Firm Booster Pump Capacity = Maximum Day Demand		
Operational Storage	30,000 gal	30,000
Fire Flow Storage	180,000 gal	180,000
Equalization Storage (zone 4 equalization at 0.08 factor)	15,245 gal	Incl. 2, 3, 4 for equalization
Equalization Storage for Zone 3	0 gal	312,516
Standby Storage	10,629 gal	10,629
Dead Storage	0 gal	0
Total	**235,874 gal**	**533,145**

Zone 3 & 4 Storage Tank Analysis (544.01&501.07) if Firm Booster Pump Capacity = Peak Hour Demand	
Operational Storage	30,000 gal
Fire Flow Storage	180,000 gal
Equalization Storage	0 gal
Standby Storage	10,629 gal
Dead Storage	0 gal
Total	**220,629 gal**

Emergency Operation Analysis (501.07): Average Day + Fire	
Zone 3 average day demand	19 gpm
Zone 3 fire flow requirement	1,500 gpm
Total demand	**1,519 gpm**
Firm booster pump contribution at Tank 2 (w/generator) at 20 psi	1,736 gpm
Shortage to be provided through PRPSV's from Zone 4	-217 gpm
Shortage to be provided through PRPSV's (w/o generator at Tank 2 BPS)	1,519 gpm

Zone 4 BPS Design - Peak Hour	
Zone 4 peak hour demand	160 gpm
Zone 3 peak hour demand shortage provided through PRPSV's	0 gpm
Total booster station requirement to Tank 3	**160 gpm**

Zone 4 BPS Design - Max Day With Addit. Zone 2 Tank	
Zone 4 peak max day demand	132 gpm
Zone 3 max day demand shortage provided through PRPSV's	0 gpm
Total booster station requirement to Tank 3	**132 gpm**

Zone 4 BPS Design - Max Day Without Addit. Zone 2 Tank + Well 7	
Zone 2,3,4 max day demand	2,713 gpm
Fire Flow Demand	1,500 gpm
Total Demand	4,213 gpm
Firm Booster Pump Capacity	1,150 gpm
Tank 2 Credit for Fire Flow Storage (101,796 gal/2hrs)	848 gpm
Well 7	1,000 gpm
	1,215 gpm

Emergency Operation Analysis (501.07) for Zone 4	
Zone 4 average day demand in winter	3 gpm
Zone 4 fire flow requirement	1,500 gpm
Total demand	1,503 gpm
Firm booster pump contribution from Big Bend BPS	0 gpm
Shortage to be provided from Tank 3 (w/o generator at Big Bend)	1,503 gpm

Options to Meet Requirements of 501.07, 544.01, 502.17 & 502.18

Max Day Firm Booster Pump Capacity Plus Fire, Equalization & Standby Storage

Build new Tank 3 and Build new Tank 2	**235,874 gal**
Bring on-line Big Bend BPS	**132 gpm**

or

Max Day Firm Booster Pump Capacity Plus Fire, Equalization & Standby Storage

Build new Tank 3 and do not build new Tank 2	**533,145 gal**
Bring on-line Big Bend BPS	**1,215 gpm**
Drill Well 7 instead of Well 1 Replacement	**1,000 gpm**
Build New Tank 1 BPS	**563 gpm**
Water Supply Shortage	**667 gpm**

Peak Hour Firm Well/Booster Pump Capacity Plus Fire & Standby Storage

Build new Tank 3	**220,629 gal**
Bring on-line Big Bend BPS	**160 gpm**

or

Maximum Day Demand Plus Fire Flow from BPS - No Tank

Total Demand	**2,236 gpm**

and

Emergency Operation Analysis (501.07): Average Day + Fire

Total demand	**1,519 gpm**

TANK 2 BPS CAPACITY

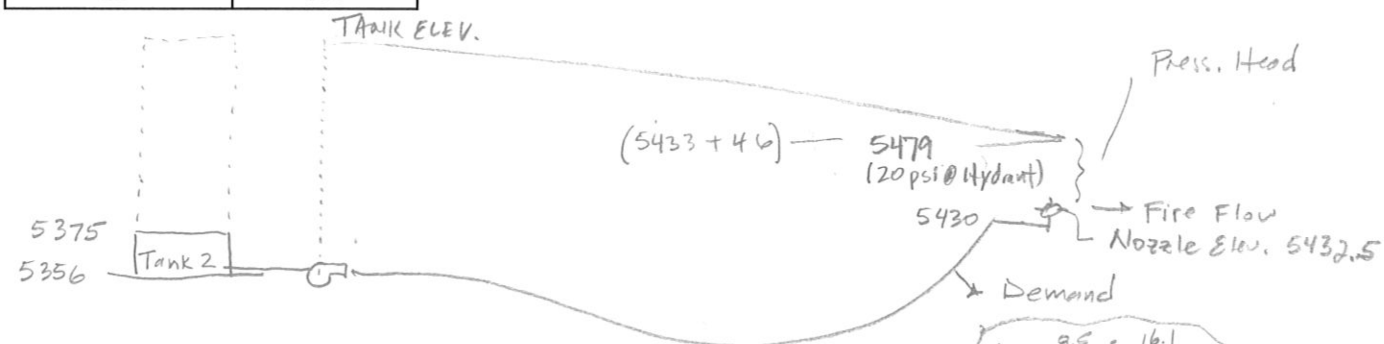
Pump Sizing w/o Loop in Dist System

ZONE 3 MAX DAY (736 GPM)					
8" Pipe Max VELOCITY (ft/s)	FLOW (gpm) in 8" Pipe	TANK ELEV.	FLOW HYD. PSI Ground Elev.=5412'	Hydrant DEMAND	READ HYD. PSI Ground Elev.=5430'
5.35	837.88	5500	24.1	200	14.8
6.38	998.84	5520	25.3	350	16.4
7.07	1108.14	5540	28.1	450	19.5
8.02	1255.82	5560	27.6	600	19.8

17.4 (GRND)
16.3 (Hydrant)

PIPE LENGTH/SIZE FROM TANK 2 - FLOW HYDRANT	
SIZE	LENGTH
8"	4300
10"	1620
12"	365

TANK CONDITIONS
ELEVATION BASE: 5356
DIAMETER (ft): 36



$19.8 - \frac{8.5}{2.31} = 16.1$

$16.1 \times 2.31 = 37.2$

$37.2 + 5432.5 = 5469.7$

$16.4 - \frac{8.5}{2.31} = 12.7$

$12.7 \times 2.31 = 29.4$

$29.4 + 5432.5 = 5461.9$

$$TDH = \underbrace{5433 - 5375}_{\text{Elev. Head}} + \underbrace{20\,psi \times 2.31}_{\text{Press H.}} + \underbrace{5560 - 5470}_{\text{Head Loss}}$$

$$58' + 46' + 90' = 194' \text{ head}$$

$$Q = 736 + 600 = 1{,}336 \text{ gpm}$$

$$H_p = \frac{1336(194)}{0.75(3960)} = 87 \text{ Hp}$$

$$Q = 736 + 350 = 1086 \text{ gpm}$$

$$H_p = \frac{1086(58 + 46 + 5520 - 5462)}{0.75(3960)} = 59 \text{ HP.}$$

Use (3) 30Hp pumps

Conclusion: Design for 6.4 ft/s velocity max in 8" line and provide 350 gpm of fire flow @ max day until tank is built.

TANK 2 BPS CAPACITY

Pump Sizing w/Loop in Dist. system

ZONE 3 MAX DAY (736 gpm)					
VELOCITY (ft/s) MAX in 8" pipe	FLOW (gpm) in 8" pipe	TANK ELEV.	FLOW HYD. PSI Ground Elev.=5412'	Hydrant DEMAND	READ HYD. PSI Ground Elev.=5430'
4.81	754.21	5545	47.8	1000	38.6
7.01	1097.57	5545	37.2	1500	28.5

Current Zone 3 needs are 1698 gpm; which can be approximated using a fire flow of 1,000 gpm at Max day flow (1000 + 736) = 1,736 gpm. Compute pump size for current needs.

PIPE LENGTH/SIZE FROM TANK 2 - FLOW HYDRANT	
SIZE	LENGTH
8"	4300
NEW 8"	**964**
10"	1620
12"	365

TANK CONDITIONS

ELEVATION BASE: 5356

DIAMETER (ft): 36

$38.6 - \frac{8.5}{2.31} = 34.9$

$34.9 \times 2.31 = 80.7'$

$80.7'$
5432.5
5513.2

Use picture on previous page

TDH = 132 ft.

$$Hp = \frac{1736(\underset{\text{Elev.}}{58} + \underset{\text{Press.}}{46} + \overbrace{5545 - 5513.}^{HL})}{0.75(3960)}$$

Hp = 77.7 Hp → Use (3) 40 Hp pumps   Fire + Max Day Demand

TANK 1 BPS CAPACITY

Pump sizing

PEAK HOUR DEMAND (5340 gpm) Future		
VELOCITY (ft/s)	FLOW (gpm)	TANK ELEV.
4.98	1219.32	5387
5.94	1453.82	5393
7.09	1735.03	5402
8.12	1987.26	5446
9.43	2309.08	5480

H_L

TANK CONDITIONS

ELEVATION BASE: 5149

DIAMETER (ft): 36

PIPE LENGTH/SIZE FROM TANK 1 - TANK 2	
SIZE	LENGTH
10"	1766
12"	2742

AVERAGE WINTER DEMAND (113 gpm) Future		
VELOCITY (ft/s)	FLOW (gpm)	TANK ELEV.
5.04	1234.92	5396
6.4	1567.04	5410
7.05	1725.31	5417
7.71	1887.37	5427

Elev. Head Max = 5375 − 5149 = 226'

MIN = 5356 − 5164 = 192'

Prepared by Schiess & Associates 3/8/2013

Press. Head = 0

Headloss = 5417 − 5375 = 42'

TDH @ 1725 GPM: 234' to 268'

$Hp = \frac{1725(268)}{0.8(3960)} = 146$ HP.

USE (3) 75 Hp Pumps

Schiess & Associates
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OFFICE: (208) 522-1244
FAX: (208) 522-9232

REXBURG, IDAHO
OFFICE: (208) 356-6092
FAX: (208) 356-6468

JOB
JOB NUMBER SCALE
CALCULATED BY DATE
CHECKED BY DATE
SHEET OF

Size Well #1 Pump

$Q = 1{,}667$ gpm $H = 450'$

Assume well pumps direct to storage tank

300 HP.

$$Hp = \frac{1667(450)}{0.8(3960)} = 236 \text{ Hp.}$$

→ From field experience Use 300 Hp.

Size Well #7 Pump

$Q = 930$ gpm $H = 550$

540' Static.

Well pumps to tank

$$H_p = \frac{930(540+60)}{0.75(3960)} = 187' \rightarrow \text{Use 200 Hp}$$

Size Well #8 & #9

Use well #7

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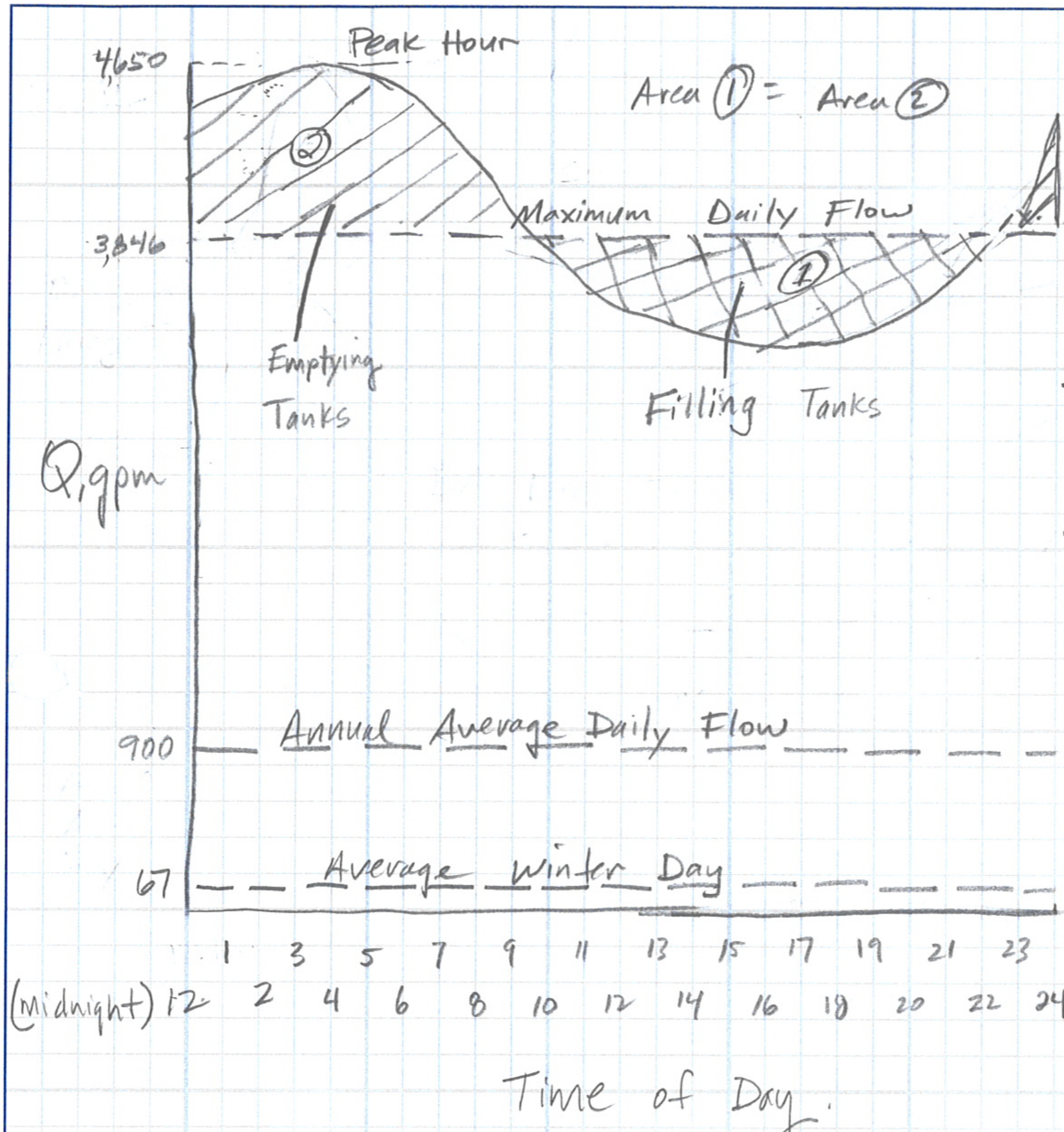
FAX: (208) 356-6468

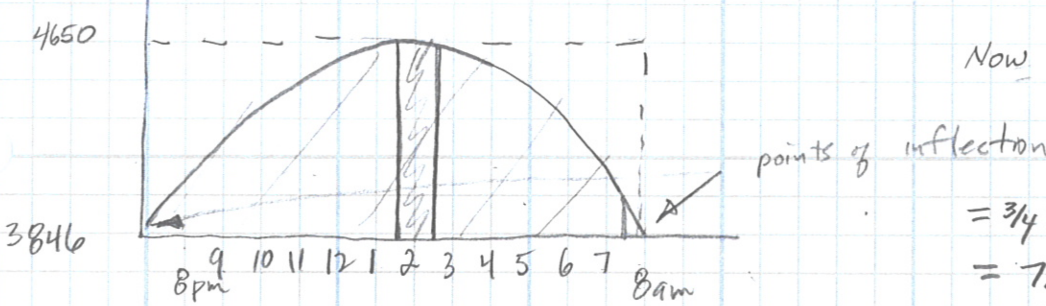
JOB: Comore Loma
JOB NUMBER: Equalization Storage Estimate
SCALE:
CALCULATED BY: PHS
DATE:
CHECKED BY:
DATE:
SHEET ___ OF ___



- On max day, all wells run all day except for backup wells.
- Tanks utilize equalization storage during the night and fill during the day.

storage = 3/4 (12 hrs * 60)(4650 − 3846)
= 434,160

Now apply to the future all lots at current use levels.



= 3/4 (12×60)(7743 − 6404)
= 723,060 gal

Zone 2+3 = $\left(\frac{223+89}{534}\right)$ = 422,462 gal Zone 1 = $\left(\frac{206}{534}\right)$ 723,060 = 278,933 gal.

12-9-13

New BPS for Tank 3

Q = 1,215 gpm , H = 300' (diff from Tank 1 to Tank 3)

+ 25' HL

325'

$$Hp = \frac{1215\ (325)}{0.8\ (3960)}$$

= 125 HP.

Use (3) 60 Hp pumps, 1 of which is redundant

Appendix C: Water Quality and Monitoring Data

Drinking Water Branch

Violations

Return Links

Water System Detail

Water Systems

Water System Search

County Map

Glossary

Water System No. :	ID7100020	**Federal Type :**	C
Water System Name :	COMORE LOMA	**State Type :**	C
Principal County Served :	BONNEVILLE	**Primary Source :**	GW
Status :	A	**Activity Date :**	05-31-1986

****Please note**: some of these violations may have been resolved and/or returned to compliance. Please click on the violation to view more information on its compliance status.**

Group Violations

Violation No.	Status	Violation Type	Violation Name	Analyte Group Code	Analyte Group Name	Water System Facility State Asgn ID	Water System Facility Name
2010-6713	V	03	MONITORING, ROUTINE MAJOR	ALFA	RADS - GROSS ALPHA	000000012031	WELL #6
2009-6276	V	03	MONITORING, ROUTINE MAJOR	ALFA	RADS - GROSS ALPHA	000000012031	WELL #6
2009-6305	V	03	MONITORING, ROUTINE MAJOR	R226	RADS - RADIUM 226	000000012031	WELL #6
2009-6322	V	03	MONITORING, ROUTINE MAJOR	R228	RADS - RADIUM 228	000000012031	WELL #6
2009-6341	V	03	MONITORING, ROUTINE MAJOR	URAN	RADS - URANIUM	000000012031	WELL #6
2009-6220	V	03	MONITORING, ROUTINE MAJOR	ALFA	RADS - GROSS ALPHA	null	null
2009-6221	V	03	MONITORING, ROUTINE MAJOR	ALFA	RADS - GROSS ALPHA	null	null
2009-6222	V	03	MONITORING, ROUTINE MAJOR	URAN	RADS - URANIUM	null	null
2009-6223	V	03	MONITORING, ROUTINE MAJOR	R226	RADS - RADIUM 226	null	null
2009-6224	V	03	MONITORING, ROUTINE MAJOR	R228	RADS - RADIUM 228	null	null

Total Number of Records Fetched = 10

Individual Violations

						Water	

Violation No.	Status	Violation Type	Violation Name	Analyte Code	Analyte Name	System Facility State Asgn ID	Water System Facility Name
2005-8305	V	21	MCL (TCR), ACUTE	3100	COLIFORM (TCR)	null	null
2005-8205	V	22	MCL (TCR), MONTHLY	3100	COLIFORM (TCR)	null	null
2005-8105	V	22	MCL (TCR), MONTHLY	3100	COLIFORM (TCR)	null	null
2003-7703	V	22	MCL (TCR), MONTHLY	3100	COLIFORM (TCR)	null	null
2001-6801	V	23	MONITORING (TCR), ROUTINE MAJOR	3100	COLIFORM (TCR)	null	null
2000-900	V	24	MONITORING (TCR), ROUTINE MINOR	3100	COLIFORM (TCR)	null	null
1999-1399	V	22	MCL (TCR), MONTHLY	3100	COLIFORM (TCR)	null	null
1999-1499	V	24	MONITORING (TCR), ROUTINE MINOR	3100	COLIFORM (TCR)	null	null
1999-1599	V	22	MCL (TCR), MONTHLY	3100	COLIFORM (TCR)	null	null
1999-1799	V	03	MONITORING, ROUTINE MAJOR	1040	NITRATE	E0007143	WELL #1 BACK UP
1999-1699	V	23	MONITORING (TCR), ROUTINE MAJOR	3100	COLIFORM (TCR)	null	null
1998-698	V	23	MONITORING (TCR), ROUTINE MAJOR	3100	COLIFORM (TCR)	null	null
1997-2097	V	03	MONITORING, ROUTINE MAJOR	1040	NITRATE	E0007144	WELL #2
1996-2496	V	03	MONITORING, ROUTINE MAJOR	1040	NITRATE	E0007144	WELL #2
1996-2596	V	03	MONITORING, ROUTINE MAJOR	2946	ETHYLENE DIBROMIDE	E0007144	WELL #2
1996-2696	V	03	MONITORING, ROUTINE MAJOR	2931	1,2-DIBROMO-3-CHLOROPROPANE	E0007144	WELL #2
1996-2796	V	03	MONITORING, ROUTINE MAJOR	2051	LASSO	E0007144	WELL #2

1996-2896	V	03	MONITORING, ROUTINE MAJOR	2050	ATRAZINE	E0007144	WELL #2
1996-2996	V	03	MONITORING, ROUTINE MAJOR	2959	CHLORDANE	E0007144	WELL #2
1996-3096	V	03	MONITORING, ROUTINE MAJOR	2065	HEPTACHLOR	E0007144	WELL #2
1996-3196	V	03	MONITORING, ROUTINE MAJOR	2067	HEPTACHLOR EPOXIDE	E0007144	WELL #2
1996-3296	V	03	MONITORING, ROUTINE MAJOR	2010	BHC-GAMMA	E0007144	WELL #2
1996-3396	V	03	MONITORING, ROUTINE MAJOR	2015	METHOXYCHLOR	E0007144	WELL #2
1996-3496	V	03	MONITORING, ROUTINE MAJOR	2020	TOXAPHENE	E0007144	WELL #2
1996-3596	V	03	MONITORING, ROUTINE MAJOR	2383	TOTAL POLYCHLORINATED BIPHENYLS (PCB)	E0007144	WELL #2
1996-3696	V	03	MONITORING, ROUTINE MAJOR	2326	PENTACHLOROPHENOL	E0007144	WELL #2
1996-3796	V	03	MONITORING, ROUTINE MAJOR	2105	2,4-D	E0007144	WELL #2
1996-3896	V	03	MONITORING, ROUTINE MAJOR	2110	2,4,5-TP	E0007144	WELL #2
1996-3996	V	03	MONITORING, ROUTINE MAJOR	2046	CARBOFURAN	E0007144	WELL #2
1996-4096	V	03	MONITORING, ROUTINE MAJOR	1010	BARIUM	E0007144	WELL #2
1996-4196	V	03	MONITORING, ROUTINE MAJOR	1015	CADMIUM	E0007144	WELL #2
1996-4296	V	03	MONITORING, ROUTINE MAJOR	1020	CHROMIUM	E0007144	WELL #2
1996-4396	V	03	MONITORING, ROUTINE MAJOR	1035	MERCURY	E0007144	WELL #2
1996-4496	V	03	MONITORING, ROUTINE MAJOR	1045	SELENIUM	E0007144	WELL #2
1996-4596	V	03	MONITORING, ROUTINE MAJOR	1025	FLUORIDE	E0007144	WELL #2
1996-			MONITORING,				WELL

4696	V	03	ROUTINE MAJOR	1041	NITRITE	E0007144	#2
1996-2396	V	23	MONITORING (TCR), ROUTINE MAJOR	3100	COLIFORM (TCR)	null	null
1994-2194	V	26	MONITORING (TCR), REPEAT MINOR	3100	COLIFORM (TCR)	null	null
1994-2294	V	23	MONITORING (TCR), ROUTINE MAJOR	3100	COLIFORM (TCR)	null	null
1992-1892	V	23	MONITORING (TCR), ROUTINE MAJOR	3100	COLIFORM (TCR)	null	null
1991-191	V	22	MCL (TCR), MONTHLY	3100	COLIFORM (TCR)	null	null
1991-1291	V	21	MCL (TCR), ACUTE	3100	COLIFORM (TCR)	null	null
1991-1191	V	21	MCL (TCR), ACUTE	3100	COLIFORM (TCR)	null	null
1991-291	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1990-890	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1989-5289	V	02	MCL, AVERAGE	3000	COLIFORM (PRE-TCR)	null	null
1989-5189	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1987-4987	V	02	MCL, AVERAGE	3000	COLIFORM (PRE-TCR)	null	null
1987-5387	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1987-5587	V	02	MCL, AVERAGE	3000	COLIFORM (PRE-TCR)	null	null
1986-5886	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1985-6085	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1985-5085	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1985-4785	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1985-4885	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null

1984-6484	V	02	MCL, AVERAGE	3000	COLIFORM (PRE-TCR)	null	null
1984-6384	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1984-6284	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1984-6184	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1983-5983	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1983-5783	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1983-5683	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1983-5483	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1983-583	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1983-383	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1982-482	V	02	MCL, AVERAGE	3000	COLIFORM (PRE-TCR)	null	null
1980-1980	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1980-1080	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1980-780	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null

Total Number of Records Fetched = 69

Appendix D: Financial Data

- 2012 Financial Statement
- Historical Cash Flow Record
- 2013 Budget
- 2013 Quarterly Rate Schedule
- 2012 Quarterly Rate Schedule
- Email from Dennis Bell to Paul Scoresby Dated February 12, 2013

COMORE LOMA WATER CORPORATION
IDAHO FALLS, IDAHO
CASH TRANSACTIONS
JANUARY 1, 2012 TO JANUARY 1, 2013

Cash (January 1, 2012)				
Checking	$129,931.30			
Savings	66,553.04			$196,484.34
Receipts - 2012				
January	$33,907.40			
February	14,872.37			
March	12,617.47			
April	35,693.70			
May	16,190.99			
June	7,505.75			
July	20,243.04			
August	33,076.96			
September	8,017.21			
October	38,944.32			
November	16,258.02			
December	9,602.90			
Subtotal Receipts		$246,930.13		
Interest Earned		184.75	$247,114.88	
Expenditures – 2012				
Power	$152,797.83			
Pump & Line	192,809.28			
Insurance	2,681.00			
Acct. & Mgmt	8,400.00			
Water Testing	1,054.67			
Phone	1,613.45			
Taxes	237.34			
Landscaping	3,341.00			
Office & Post	2,989.84			
Subtotal Expenditures			$365,924.41	
Expenditures in Excess of Receipts				($118,809.53)
Cash(January 1, 2013)				
Checking	$53,264.06			
Savings	24,410.75			$ 77,674.81

Prepared by Dennis Bell
January 18, 2013

Comore Loma Water Corporation Past Years cash flow

Year	2007	2008	2009	2010	2011	2012
Power	100346	120000	101397	111543.4	125944.1	152797
Pump and Line Maintenance	52069.64	40000	187548.8	55199.2	10020.38	192809
Insurance	1054	1000	1479	1205	1065	2681
Acct and Mgmt	8450	8500	8425	8400	8400	8400
Water testing	1760	1800	2058.1	4257	3331.54	1054
Phone	320.69	300	556.51	520.45	1289.24	1613
Taxes	659.16	700	1266.24	734.82	220.98	237
Office and Post	2522.17	2600	2365.6	1801.47	3307.29	2989
Lawn Care		1400	2040.55	3224.72	3002.44	3344
Total expenses	167181.7	176300	307136.8	186886.1	156580.9	365924
Cash on Hand at start of year	139967.9	145289.7	157593.1	65860.56	110522.5	196484.6
Total Revenue at end of year	167863.9	165000	213745.7	231228	242226.2	246930
Total Expenditures at end of year	167181.7	176300	307136.8	186886.1	156580.9	365924
Cash on Hand at end of year	145289.7	134716.1	65860.56	110522.5	196484.6	77674.59

COMORE LOMA WATER CORPORATION
2013 Budget

Cash January 1, 2013		$ 77,675
Receipts – 2013 (New rate schedule)	$372,694	
Interest Earned	$500	
Total Receipts		$373,194
Expenditures – 2013		

Power	$175,000
Pump & Line	100,000
Insurance	3,000
Acct. & Mgmt	60,000
Water Testing	3,000
Phone	1,700
Taxes	300
Office & Post	3,500
Lawn Care	3,400

Total Expenditures	$349,900
Contingency 5%	$ 17,500
Cash (January 1, 2014) estimated	$ 83,469

2013
COMORE LOMA WATER CORPORATION

Quarterly Water Rates Revised April 2013

Area Watered		Amount billed each Quarter Year
0.5 ACRES WATERED	BASE RATE	$150.00
0.6 ACRES WATERED		180.00
0.7 ACRES WATERED		210.00
0.8 ACRES WATERED		240.00
0.9 ACRES WATERED		270.00
1.0 ACRES WATERED		300.00
1.1 ACRES WATERED		330.00
1.2 ACRES WATERED		360.00
1.3 ACRES WATERED		390.00
1.4 ACRES WATERED		420.00
1.5 ACRES WATERED		450.00
1.6 ACRES WATERED		480.00
1.7 ACRES WATERED		510.00
1.8 ACRES WATERED		540.00
1.9 ACRES WATERED		570.00
2.0 ACRES WATERED		600.00
2.1 ACRES WATERED		630.00
2.2 ACRES WATERED		660.00
2.3 ACRES WATERED		690.00
2.4 ACRES WATERED		720.00
2.5 ACRES WATERED		750.00
2.6 ACRES WATERED		780.00
3.0 ACRES WATERED		900.00
3.1 ACRES WATERED		930.00
3.2 ACRES WATERED		960.00
3.5 ACRES WATERED		1050.00
4.3 ACRES WATERED		1290.00
4.8 ACRES WATERED		1440.00

COMORE LOMA WATER CORP 2012 RATES

ACRES WATERED	RATE PER QUARTER
.5 BASE RATE	150
.6	167
.7	185
.8	202
.9	211
1.0	236
1.1	254
1.2	271
1.3	288
1.4	305
1.5	323
1.6	340
1.7	357
1.8	374
1.9	391
2.0	409
2.1	426
2.2	443
2.3	461
2.4	478
2.5	495
2.6	512
2.7	530
2.8	547
2.9	565
3.0	581
3.1	599
3.2	616
3.3	634
3.4	651
3.5	668
3.6	686
3.7	704
3.8	721
3.9	739
4.0	756

4.1	773
4.2	790
4.3	806
4.4	824
4.5	841
4.6	858
4.7	875
4.8	892
4.9	909
5.0	927

Gmail by Google

Paul Scoresby <pscoresby@schiesseng.com>

Questions for the USDA study

2 messages

Paul Scoresby <pscoresby@schiesseng.com> Tue, Feb 12, 2013 at 6:25 PM
To: [redacted]
Cc: [redacted]

[redacted]

Would you or maybe Randy or Dennis send me a paragraph or two by email of why the pump and line costs were so high for 2012. There are valid reasons I know. Didn't you replace Well #4 or Well #5 with a line shaft pump? Then you had some lightning issues with the VFD at Well #6? Please tell me of the misfortune and help me understand in a normal year what the Pump and Line line item in the Expenditures column of your 2012 financial statement would normally be.

It appears that the other line items are rather typical. I suppose the landscaping is for yard maintenance of your well and tank sites. Please verify.

Sincerely,

--

Paul H. Scoresby, MS, PE

Schiess & Associates
7103 S. 45th W. I Idaho Falls, Idaho 83402
208-522-1244 I FAX 208-522-9232 I Cell 208-313-2454
pscoresby@schiesseng.com

[redacted] Tue, Feb 12, 2013 at 9:41 PM
To: Paul Scoresby <pscoresby@schiesseng.com>

The breakdown is about $135000 to andrews for wells 3 , 4, 5, and 6 and some work on tank 2 boosters. $17395 to Schiess and assco. for engineering services, $9051 to ATS for control work, and $17000 for line repair, fire hydrants, and valves. and another $10000 for miscellaneous. Well 5 was the biggest expense at around $80,000 for ground work and the new above ground setup. Well 3 was about $18000which was damaged at the same time as well 4, well 4 was about $23000and was Rocky mtns fault. well 6 repairs were about $10000 and about $4000 at tank 2 boosters. About half of the ATS work was for damages from Rocky Mtn power.

[Quoted text hidden]

$192,800 Actual Expenses
- 17,400 Engineering (one time service)
- 80,000 Well 5 Rehab (capital improvement)
- 45,000 Well 3 & Well 4 misfortune. A spare pump and motor were purchased.
- 10,000 Misfortune at Well 6. Also the system has purchased a spare motor for well 6 or well 5.

$39,600 → Use $100,000

Gmail by Google

Paul Scoresby <pscoresby@schiesseng.com>

Questions for the USDA study

[redacted] Fri, Feb 15, 2013 at 5:24 PM
To: Paul Scoresby <pscoresby@schiesseng.com>

Here are some of the answers you needed.

Solvent joints were used in the early phases of the development. Mainly on 6 and 8 inch lines. As the development moved up the hill more gasket type joints were used. There is no good data on the amount of pipe but we did have major repairs last year on an old line but this may have been due to cracks not bad joints.

Most of the water service lines are 2 inch. The newer lines near the top of the hill use 1 1/2 inch.

I do not have all the costs in yet for replacing tank 2 booster but I think an estimate of $125K is close. I will update this as I get better information.

Should we plan to get together sometime next week for a status check or is it still too early?
Let me know what you think.
John

Appendix E: DEQ Sanitary Survey

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

900 North Skyline Drive, Suite B • Idaho Falls, Idaho 83402 • (208) 528-2650

C.L. "Butch" Otter, Governor
Toni Hardesty, Director

May 18, 2010

Dennis Bell
5353 E. Skidmore Drive
Idaho Falls, ID 83406

Subject: Enhanced Sanitary Survey conducted on April 20, 2010 **PWS# 7100020**

Dear Mr. Bell:

A copy of the Enhanced Sanitary Survey form, the photo log and photos for Public Water System **7100020** are enclosed with this mailing for your records. Attached, you will find a list of the significant deficiencies and/or recommended improvements for your system.

Please consult with your regulating agency regarding the significant deficiencies identified in this written notification. Upon agreement between the public water system and the regulating agency, please provide a written corrective action plan to the regulating agency that addresses all significant deficiencies. This consultation with the regulating agency shall be completed within 30 days of receiving this written notification. This request is Pursuant to IDAPA 58.01.08.323 for groundwater systems and IDAPA 58.01.08.302 for surface water systems.

For all new water systems or modifications to existing water systems, an engineering report shall be submitted to the Department of Environmental Quality (DEQ) for review and approval prior to or concurrent with the submittal of plans and specifications as required in Subsection 503.03, pursuant to IDAPA 58.01.08.503.

Prior to construction of new public water supply systems or modifications of existing public water supply systems, plans and specifications must be submitted to the DEQ for review, and approved, pursuant to IDAPA 58.01.08.504.

Thank you for your time and cooperation in the completion of this survey. If you have any questions, please contact Carlin Feisthamel at the IDEQ Idaho Falls Regional Office at (208)-528-2650.

Sincerely,

Carlin Feisthamel, P.E.
Water Quality Engineer
Idaho Falls Regional Office

Enclosures: Enhanced Sanitary Survey Report
Enhanced Sanitary Survey Inspection Form
Sanitary Survey Photos
Cross-Connection Control Information

c: Rochelle Mason, Water Quality Analyst

May 18, 2010
Comore Loma
PWS# 7100020

RE: Enhanced Sanitary Survey conducted on ***April 20, 2010***

You will find a list of the significant deficiencies, deficiencies and recommended improvements for your system summarized below. In order to address all significant deficiencies, follow steps 1, 2 & 3.

Step 1:
After reviewing the significant deficiencies listed below, please call our office to identify a corrective action plan for each significant deficiency within 30 days of receiving this written notification. During that call, please be prepared to provide a "Planned Completion Date" for each item.

Step 2:
Complete the planned action(s) by the agreed upon date.

Step 3:
Enter an "Actual Completion Date", Initials, identify the "Corrective action taken", and sign that each corrective action has been corrected by the agreed upon date and that the corrective action meets the requirements pursuant to IDAPA 58.01.08. Please send a copy of the corrective action taken to the regulating agency.

Significant Deficiencies

General Information:

Planned Completion Date: ____________,
Actual Completion Date: ____________, Initials________.
Corrective action taken:

Groundwater Source:

The well casing for well #2 and Well #3 is not vented with the open end of the vent screened and/or terminated downward at least 18 inches above the final ground surface and it cannot be demonstrated that the drawdown under maximum pumping conditions will not exceed ten (10) feet, as required by IDAPA 58.01.08.511.05.

Planned Completion Date: ____________,
Actual Completion Date: ____________, Initials________.
Corrective action taken:

All threaded non-sample taps installed in the pump house or vault are not equipped with an appropriate backflow prevention device, as required by IDAPA 58.01.08. 541.01.n.

Planned Completion Date: ____________,
Actual Completion Date: ____________, Initials________.
Corrective action taken:

Well #2 is not provided with a sanitary cap that prevents surface water from entering the well, as required by IDAPA ,8.01.08.511.06.b. At the time of the inspection the well cap was not secured properly.

Attn: Rochelle Mason
2 pages

May 18, 2010
Comore Loma
PWS# 7100020

RE: Enhanced Sanitary Survey conducted on ***April 20, 2010***

You will find a list of the significant deficiencies, deficiencies and recommended improvements for your system summarized below. In order to address all significant deficiencies, follow steps 1, 2 & 3.

Step 1:
After reviewing the significant deficiencies listed below, please call our office to identify a corrective action plan for each significant deficiency within 30 days of receiving this written notification. During that call, please be prepared to provide a "Planned Completion Date" for each item.

Step 2:
Complete the planned action(s) by the agreed upon date.

Step 3:
Enter an "Actual Completion Date", Initials, identify the "Corrective action taken", and sign that each corrective action has been corrected by the agreed upon date and that the corrective action meets the requirements pursuant to IDAPA 58.01.08. Please send a copy of the corrective action taken to the regulating agency.

Significant Deficiencies

General Information:

Planned Completion Date: 5-26-10,
Actual Completion Date: 5-26-10, *Initials* OK.
Corrective action taken:

Groundwater Source:

* The well casing for well #2 and Well #3 is not vented with the open end of the vent screened and/or terminated downward at least 18 inches above the final ground surface and it cannot be demonstrated that the drawdown under maximum pumping conditions will not exceed ten (10) feet, as required by IDAPA 58.01.08.511.05.

Planned Completion Date: 5-26-10,
Actual Completion Date: 5-26-10, *Initials* OK.
Corrective action taken: Vents Installed at Well 2 + 3

All threaded non-sample taps installed in the pump house or vault are not equipped with an appropriate backflow prevention device, as required by IDAPA 58.01.08. 541.01.n.

Planned Completion Date: 5-25-10,
Actual Completion Date: 5-25-10, *Initials* OK
Corrective action taken: Backflow prevention installed in pump house

* Well #2 is not provided with a sanitary cap that prevents surface water from entering the well, as required by IDAPA 58.01.08.511.06.b. At the time of the inspection the well cap was not secured properly.

Planned Completion Date: ____________,

Actual Completion Date: ____________, *Initials*________.
Corrective action taken:

Storage: None

Hydropneumatic Tanks: None

Distribution:

(Community PWSs Only) There is no cross connection control program for the PWS, as required by IDAPA 58.01.08.552.06.

Planned Completion Date: ____________,

Actual Completion Date: ____________, *Initials*________.
Corrective action taken:

Pumping:

At the Middle Fork booster station, a booster pump is directly connected to the distribution system and does not have a water pressure relief valve installed, as required by IDAPA 58.01.08.542.03.

Planned Completion Date: ____________,

Actual Completion Date: ____________, *Initials*________.
Corrective action taken:

Financial: None

Managerial: None

I certify, to the best of my knowledge that all significant deficiencies have been corrected by the agreed upon date and that the corrective action meet the requirements pursuant to IDAPA 58.01.08.

Signature: ____ **Date:** ________________

Planned Completion Date: 5-21-10 ,
Actual Completion Date: 5-26-10 , *Initials* DB .
Corrective action taken: Well cap was reinstalled correctly

Storage: None

Hydropneumatic Tanks: None

Distribution:

(Community PWSs Only) There is no cross connection control program for the PWS, as required by IDAPA 58.01.08.552.06.

Planned Completion Date: 5-25-10 ,
Actual Completion Date: 5-26-10 , *Initials* DB .
Corrective action taken: Cross Connection Control Program implemented.

Pumping:

At the Middle Fork booster station, a booster pump is directly connected to the distribution system and does not have a water pressure relief valve installed, as required by IDAPA 58.01.08.542.03.

Planned Completion Date: 5-25-10 ,
Actual Completion Date: 5-25-10 , *Initials* DB .
Corrective action taken: Air relief valve installed on 3rd Booster pump.

Financial: None

Managerial: None

I certify, to the best of my knowledge that all significant deficiencies have been corrected by the agreed upon date and that the corrective action meet the requirements pursuant to IDAPA 58.01.08.

Signature: [signature] **Date:** 5-26-10

Deficiencies
General Information: None

Groundwater Source:

The well casing for well #2 does not extend 18 inches above the final ground surface and/or 12 inches above the pump house floor, as required by IDAPA 58.01.08. 511.06.a. There is a low potential for the casing to be covered by water during a flooding event. The casing height requirement will be reevaluated every time an ESS is conducted. **(No action required at this time)**

The pump distribution line for well #4 does not provide a working instantaneous and totalizing flow meter equipped with nonvolatile memory pursuant to IDAPA 58.01.08.511.04. The Department has deemed a flow meter to be unnecessary for well #4 at this time. The requirement of a flow meter will be reevaluated every time an ESS is conducted. **(No Action Required)**

Storage: None

Hydropneumatic Tanks: None

Distribution: None

Pumping:

There is no auxiliary power on-site for any of the water system pumps, as required by IDAPA 58.01.08.501.07. The rule requires that new community water systems constructed after April 15, 2007 must have sufficient dedicated on-site standby power. In addition, any new wells or booster stations constructed after April 15, 2007 must have sufficient dedicated on-site power. **(No action required at this time)**

Financial: None

Managerial: None

Recommendations
General Information: None

Groundwater Source:

- DEQ recommends the wells be protected from unauthorized entry through fencing around the source or using a locking well cap.

Storage: None

Hydropneumatic Tanks: None

Distribution:

- As a reminder, any time the distribution system drops below 20 psi., the public water system must provide public notice and disinfect the system to be in accordance with IDAPA 58.01.08.552.01.b.i.
- DEQ recommends the PWS set up a water conservation program.

Pumping: None

Financial:

- DEQ recommends that an independent financial audit be completed of the PWS.
- DEQ recommends the water system management review financial reports at least monthly.

Managerial: None

Treatment Application: None

Disinfection:

This system will be in substantial compliance with regulations if the significant deficiencies of this survey are corrected. Thank you for your time and cooperation in the completion of this survey. If you have any questions, please contact Carlin Feisthamel at the IDEQ Idaho Falls Regional Office at (208)-528-2650.

Sincerely,

Carlin Feisthamel, P.E.
Water Quality Engineer
Idaho Falls Regional Office

Enclosures: Enhanced Sanitary Survey Report
Enhanced Sanitary Survey Inspection Form
Sanitary Survey Photos
Cross-Connection Control Information

Idaho Department of Environmental Quality
Idaho Falls Regional Office
Sanitary Survey Report
Comore Loma
April 20, 2010

I. INTRODUCTION

A. Purpose of Report

The purpose of this report is to present a sanitary engineering review of the **Comore Loma** water system that we conducted on April 20, 2010.

B. Summary Description of System

The **Comore Loma** water system is a residential development located in the foothills south east of the City of Idaho Falls. The development is served by a community water system. Currently the water system serves approximately 620 residents through approximately 267 service connections. The water system consists of five active drinking water wells, two storage tanks, and three booster stations.

II. INVESTIGATION AND ANALYSIS

A. Sources of information

1. Dennis R. Bell, Water System Operator
2. Randy Skidmore, Developer/Operator
3. Carlin Feisthamel, Water Quality Engineer, DEQ
4. Field Investigation

B. Sources

The development is served by five wells with a total production capacity in the range of 3900 to 4200 gallons per minute (gpm). The wells range in depth from about 300 to 500 feet with yields ranging from 225 gpm to 1500 gpm. Currently all of the wells pump directly into the lower pressure zone of the distribution system. There is no disinfection or other treatment associated with the drinking water wells. Also, none of the wells have access to standby power. Wells 2-5 are turned on and off on the basis of the level controls in the lower storage tank. The level control in the upper storage tank controls Well #6 and the booster stations. There is a combination of radio telemetry and hard wire controls to the various wells.

C. Treatment

The system has no treatment.

D. Storage

The water system has two storage tanks, the 100,000 gallon lower storage tank, and a 200,000 gallon upper storage tank. The lower storage tank is constructed of concrete and was built around 1974. The concrete storage tank has had some leaks in the past that have been fixed and overall the structure appears to be sound. At the time of the inspection we were not able to access the top of the tank to inspect the access hatch or the vents. The tank is equipped with an overflow and drain pipe that was screened and discharges to a concrete splash pad. No deficiencies were found at the lower tank.

The upper tank is a bolted steel 200,000 gallon tank that was installed in 2003. The tank is relatively new and the structure was in excellent condition. The access hatch on the tank is the overlapping shoebox type hatch that was secured with a lock. The tank is equipped with a screened vent that was in good condition at the time of the inspection. The tank is equipped with an overflow and drain pipe and the overflow discharges to a rock covered splash area. The force of the water has caused some erosion near the overflow and it is recommended that larger rocks be placed in the splash area to disperse the force of the water.

E. Distribution System

The distribution system consists of mostly 6-inch PVC pressure pipe. There are also some sections of 8-inch and 10-inch PVC pipe in the distribution system. The distribution system operates in two principle pressure zones and serves elevations which range from about 5360 (upper tank site) to 4830 (lowest house site), a difference of about 530 feet or 230 psi. The upper pressure zone (Zone 1) is serviced with the upper storage tank and three booster stations. The booster stations are located at elevations of about 5080 (Sagewood), 5040 (Middle Fork) and 5140 (Tank 1). The booster stations are controlled by the water levels in the upper tank. The booster station at the lower storage tank supplies a dedicated line that without the booster station experiences low pressures.

The distribution system appears to be in good condition and there have been no interruptions in service in the past year. The water system does encourage users to conserve water and has established routine maintenance procedures. The water system has not developed a written cross-connection control program that is required by the Idaho Rules.

F. Pump Facilities and Controls

The system currently has three booster stations which service the upper portions of the development and five wells that serve the lower portion of the development. The booster stations move water from the lower to the upper pressure zones. The Middle Fork booster station has recently been re-designed with upgraded piping and the addition of Well #6, which resulted in an increase in pumping capacity to approximately 1200 gpm. Controls for the Middle Fork booster station are linked to Wells #2 and #6.

The Sagewood booster station was also recently redesigned to allow the pumps to operate in series rather than parallel. The series arrangement increases the discharge head necessary to pump to the upper 200,000 gallon storage tank. With the change to series pumping, this booster pump station with the existing pumps installed will be capable of flows of approximately 400 gpm. Due to drops in suction pressure the booster station is equipped with a low pressure cut-off to prevent low or negative pressures in the suction line.

The Tank #1 booster station serves a dedicated line that supplies a limited number of houses that otherwise would have low pressure without a booster pump. In addition to the booster pumps there are also pressure tanks that serve this small portion of the development. The pressure tanks help regulate pressure and also prevent the pumps from cycling to often.

There are five pumps associated with the five groundwater wells for the system. Wells #2 through #5 are equipped with submersible pumps that produce flows of 225, 700, 700, and 1100 gpm respectively. Well #6 is equipped with a vertical turbine pump that produces approximately 1500 gpm. The vertical turbine pump is lubricated with NSF approved food grade oil, and is equipped with all of the necessary appurtenances. All of the wells are controlled by telemetry which is triggered by the levels in the storage tanks. The well pumps all pump directly into the lower pressure zone, which is then boosted into the upper pressure zone. In the event of a malfunction of the telemetry the pumps can be operated manually.

G. Monitoring and Reporting

The Comore Loma water system is classified as a community water system and is required to monitor for total coliform bacteria, nitrate/nitrite, inorganic chemicals (IOC), volatile organic chemicals (VOC), synthetic organic chemicals (SOC), lead/copper, and radiological constituents. The water system is currently in significant compliance with all of the monitoring requirements of the Idaho Rules for Public Drinking Water Systems. Records are maintained for bacteriological and chemical analysis, repairs and maintenance, and correspondence with the DEQ. The water system does an adequate job of keeping records for the water system

H. Operation and Maintenance

The water system is owned and operated by the Comore Loma Homeowners Association. Dennis R. Bell is the operator in charge, and Randy Skidmore serves as the substitute operator for the water system. Routine operation and maintenance schedules have been established for the water system like pumping wells to waste prior to placing back into service. The overall operation and maintenance of the system appeared to be adequate at the time of the inspection.

State of Idaho Public Water System Enhanced Sanitary Survey

WATER SYSTEM INVENTORY INFORMATION

SURVEY DATE		PWS #
5/7/2010	(mm/dd/yyyy)	7100020

…ne of Public Water System:	Comore Loma
# of Groundwater Sources:	4
#of Surface Water Sources:	0
# of Storage Facilities:	2
Total Storage (gal):	300,000
Date of Last Survey:	08/20/2002
Health District:	☑ N/A
DEQ Region:	☐ N/A — IFRO
County:	Bonneville
Number of Service Connections:	267
Residential Population:	620
Status:	☑ Approved ☐ Disapproved
Water Purchased From:	☑ N/A — PWS #: Name:
Water Sold To:	☑ N/A — PWS #: Name:
Owner Type:	Private
Legal Entity:	Corporation
Water System Classification:	☑ Community Water System ☐ Nontransient Noncommunity ☐ Transient Noncommunity - NC
Combined Sources?	☐ Yes ☑ No — If yes, ☐ Well Field ☐ Manifold/Spring Box — Sources Combined:
System Classification:	Distribution: DST1 — Treatment: ☑ N/A
Seasonal Operation Dates.	☑ N/A — Date Open: Date Closed:

Responsible Charge Operator (DO): ☐ No DO ☐ N/A - Identify Operator for GW-NC PWS)

☑ Mr. ☐ Ms. Dennis Bell

Properly Licensed?	☑ Yes ☐ No ☐ N/A-GW-NC
License Type:	☐ N/A
License Number:	dwdvsws 11954-gp
Mailing Address:	5353 E. Skidmore Dr.
City, State, Zip Code:	Idaho Falls, ID 83406
Telephone	Day: 526-0289 Night: 523-2478 Fax:
E-mail:	MNDBell@ida.net

Legal Owner's Name: ☐ Mr. ☐ Ms. Comore Loma Water Corp.

Mailing Address:	5353 E. Skidmore Drive
City, State, Zip Code:	Idaho Falls, ID 83406
Telephone	Day: 523-2478 Night: Fax:
E-mail:	

Substitute Responsible Charge Operator (OP): ☐ No OP ☐ N/A for GW-NC PWS

☑ Mr. ☐ Ms. Randy Skidmore

Properly Licensed?	☑ Yes ☐ No ☐ N/A-GW-NC
License Type:	dwdvsws ☐ N/A
License Number:	11524
Mailing Address:	3920 E. Skidmore Drive
City, State, Zip Code:	Idaho Falls, ID 83406
Telephone	Day: 522-4668 Night: Fax:
E-mail:	randys@skidmoreincidaho.com

Individuals present during inspection:

Name	Title
Dennis Bell	Operator
Randy Skidmore	Sub. Operator
Merrill Hemming	EIPHD

Physical location of the PWS (Township, Range, Section):

Samples taken at the time of survey by inspector? ☐ Yes ☑ No

If yes, what:

Survey performed by:

Name: Carlin Feisthamel

Title: Water Quality Engineer

Phone #: 208-528-2650

Agency: ☑ IDEQ ☐ Health Dept. ☐ Other:

General Information

yes	no	n/a	unk	note	
☑	☐	☐	☐	☐	1. Have previously required Significant Deficiencies & Deficiencies been addressed?
☑	☐	☐	☐	☐	2. Have modifications been made to the PWS since the last ESS?
☑	☐	☐	☐	☐	3. If yes, are the modifications considered to be significant?
☑	☐	☐	☐	☐	4. If yes, were plans and specs submitted to and approved by DEQ?
☐	☑	☐	☐	☐	5. Are there any known issues or problems with equipment or operation of the PWS that could negatively effect the quality of the water produced? (*If yes, comment*)

Comments:

Sanitary Survey Index

Modules used:	#
☐ General Information	
☐ Groundwater Source	
☐ Storage	
☐ Hydropneumatic Tanks	
☐ Distribution	
☐ Pumping	
☐ Financial Capacity	
☐ Managerial Capacity	
☐ Treatment Application	
☐ Disinfection	
☐ Notes	
☐ Photo Log	
Total Modules	0

Page ____ Of ____

GROUNDWATER SOURCE - PG.1

SURVEY DATE: 5/7/2010 (mm/dd/yyyy) | PWS #: 7100020

A separate sources form must be filled out for each groundwater source in the PWS.

Tag #:	Common Name of Source:	Source:	Is this Source Treated? ☐ Yes ☑ No
;007144	Well #2	☑ Well → ☐ Manifold ☐ Spring → ☐ Spring Box	Treatment Objective: ☑ N/A

Physical Location:

Treatment Types: ☑ N/A
(Identify Treatment Train in Comments)

Is there a well log for the groundwater source? ☑ Yes ☐ No ☐ N/A ☐ Unk

Pump Capacity (GPM)	Casing Size (In)	Date Drilled:	Well Depth (Ft)	Casing Depth (Ft)	Grout Depth(Ft)	Static Water Depth (Ft)
100 ☐ Unk	8 ☐ Unk	11/1/1973 ☐ Unk	295 ☐ Unk	198 ☐ Unk	20 ☐ Unk	220 ☐ Unk

Is the Casing Screened?	Screen Depth (Ft): ☑ N/A ☐ Unk	Is the Casing Perforated?	Perforation Depth (Ft): ☑ N/A ☐ Unk
☐ Yes ☑ No ☐ Unk ☐ N/A	From: To.	☐ Yes ☑ No ☐ Unk ☐ N/A	From: To:

Latitude (Decimal):

Longitude (Decimal):

All Sources

1. This source is:
   ☑ Active ☐ Proposed
   ☐ Inactive ☐ Emergency (<60 days per year)

yes	no	n/a	unk	note	Question
☑	☐	☐	☐	☐	2. Has there been a Source Water Assessment conducted for the source? Date:
☑	☐	☐	☐	☐	3. Has a final GWUDI determination been done for this source? Date: 8/20/2002

☐ N/A 4-36 if source is a spring

WELL INFORMATION

yes	no	n/a	unk	note	Question
☑	☐		☐	☐	4. Is the well on a separate lot that is large enough to provide a minimum distance of 50 feet between the well and the nearest property line? (applicable if constructed after 11/1/77) ☐ Significant ☐ Deficiency
					Are the following minimum distances from the PWS well being met?
☑	☐		☐	☐	5. - Gravity sewer line....50 Ft.
☑	☐		☐	☐	6. - Pressure sewer line....100 Ft.
☑	☐		☐	☐	7. - Individual home septic tank....100 Ft.
☑	☐		☐	☐	8. - Individual home disposal field....100 Ft.
☑	☐		☐	☐	9. - Individual home seepage pit....100 Ft.
☑	☐		☐	☐	10. - Privies....100 Ft.
☑	☐		☐	☐	11. - Livestock....50 Ft.
☑	☐		☐	☐	12. - Canals, streams, ditches, lakes, ponds and tanks used to store nonpotable substances....50 Ft.
☐	☑		☐	☐	13. Are pesticides, herbicides, fertilizers, portable containers of petroleum products, or other toxic or hazardous materials stored on the well lot?
☐	☑		☐	☐	14. Are pesticides, herbicides, or fertilizers applied to the well lot?
☐	☑		☐	☐	15. Is the well in a pit? If yes, Date constructed:
☐	☐	☑	☐	☐	16. Was the well that is located in a pit installed after 11/5/64?
☐	☐	☑	☐	☐	17. If pit was installed prior to 11/5/64 – Has DEQ granted an exception and does the pit have water tight construction of pit walls and floor, a floor drain and an acceptable pit cover?

yes	no	n/a	unk	note	Question
☐	☑	☐	☐	☐	18 Is the well protected from unauthorized entry? *(Recommended)*
☐	☑	☐	☐	☐	19 Does the casing extend a minimum of 18 inches above the final ground surface and/ or 12 inches above the pump house floor? ☐ Significant ☑
☐	☑	☐	☐	☐	20 Is the well vented with the open end of the vent screened and terminated downward at least 18 inches above the final ground surface?
☑	☐		☐	☐	21. Is the well provided with a sanitary cap that prevents surface water entry?
☑	☐		☐	☐	22. Is the well cased and sealed in such a manner that surface water cannot enter the well?

COMMENTS:
(Please indicate question number)

19. Ground slopes away from the wellhead and the well is not subject to flooding.

20. Wellhead not equipped with a vent.

Page ______ Of ______

	Common Name	SURVEY DATE		PWS #
GROUNDWATER SOURCES - PG. 2	Well #2	5/7/2010	*(mm/dd/yyyy)*	7100020

WELL INFORMATION (cont.)

yes	no	n/a	unk	note	Question
☐	☑	☐	☐	☐	23. Is there a smooth nosed sample tap provided on the well discharge pipe prior to treatment? (Threaded tap is approved with backflow preventer)
☑	☐	☐	☐	☐ ☐ Unnecessary	24. Is an instantaneous and totalizing flow meter equipped with nonvolatile memory installed on the pump distribution line of the well and is it maintained and working properly? ____ gallons
☑	☐	☐	☐	☐	25. Is a pressure gauge provided at all installations and is it maintained and working properly? 60 psi.
☑	☐	☐	☐	☐	26. Can the well be pumped to waste at the design capacity of the well via an approved air gap at a location prior to the first service connection?

PUMP HOUSE *(Any structure containing important water system components)*

yes	no	n/a	unk	note	Question
☐	☑	☐	☐	☐	27. Is the source located in a pump house?
☑	☐	☐	☐	☐	28. Is the pump house kept clean and in good repair? *(Floor cracks?)*
☑	☐	☐	☐	☐	29. Is the pump house protected from unauthorized personnel?
☐	☐	☑	☐	☐	30. Does the pump house have adequate lighting throughout? *(Recommended)*
☐	☑	☐	☐	☐	31 Are all non-sample taps installed in the pump house equipped with an appropriate backflow prevention device?
☑	☐	☐	☐	☐ ☐ Significant ☐ Deficiency	32. Is adequate ventilation provided in the pump house for dissipation of excess heat and moisture from the equipment?
☑	☐	☐	☐	☐ ☐ Significant ☐ Deficiency	33. Is adequate heating provided in the pump house to provided safe and efficient operation of equipment to prevent freezing?
☐	☐	☑	☐	☐	34. Is the pump house protected from flooding, have adequate drainage, is the floor surface at least six (6) inches above the final ground surface, and is the ground surface graded so as to lead surface water away from the pump house?
☐	☐	☑	☐	☐	35. Is the sump for pump house floor drains closer than 30 feet from the well?
☐	☑	☐	☐	☐	36. Is the floor drain connected to sewer, storm drains, chlorination room drains, or any other source of contamination?

SPRING INFORMATION

yes	no	n/a	unk	note	Question
☐	☐	☑	☐	☐	37. Is the entire area within a one hundred (100) foot radius of the spring box fenced to prevent trespassing of livestock and void of buildings, dwellings and sources of contamination?
☐	☐	☑	☐	☐	38. Is surface water diverted from the 100 foot protection zone around the spring?
☐	☐	☑	☐	☐	39. Is the spring housed in a permanent structure and protected from contamination including the entry of surface water, animals and dust?
☐	☐	☑	☐	☐	40. Is there a smooth nosed sample tap provided on the spring discharge pipe prior to treatment? (Threaded tap is approved with backflow preventer)
☐	☐	☑	☐	☐	41. Is a flow meter or other flow measuring device provided?

SPRING BOX INFORMATION *(Not all existing springs have a spring box)*

yes	no	n/a	unk	note	Question
☐	☐	☑	☐	☐	42. Is the spring box equipped with a screened overflow?
☐	☐	☑	☐	☐	43. Is the supply intake located above the floor of the collection chamber?
☐	☐	☑	☐	☐	44. Is the spring box protected from contamination including the entry of surface water, animals, and dust?
☐	☐	☑	☐	☐	45 Is the access port fitted with a solid water tight cover which overlaps a framed opening and extended down around the frame at least 2 inches?
☐	☐	☑	☐	☐	46. Is the access port a framed opening that is at least 4 inches high with a locking device?
☐	☐	☑	☐	☐	47 Is the access port elevated at least twenty-four (24) inches above the top of the box or ground level, whichever is higher?

COMMENTS:
(Please indicate question number)

23. Backflow preventer needed

GROUNDWATER SOURCE - PG.1

A separate sources form must be filled out for each groundwater source in the PWS.

SURVEY DATE		PWS #
5/7/2010	*(mm/dd/yyyy)*	7100020

Tag #:	Common Name of Source:	Source:	Is this Source Treated? ☐ Yes ☑ No
007145	Well #3	☑ Well → ☐ Manifold ☐ Spring → ☐ Spring Box	Treatment Objective: ☑ N/A
Physical Location:			Treatment Types: ☑ N/A *(Identify Treatment Train in Comments)*

Is there a well log for the groundwater source? ☑ Yes ☐ No ☐ N/A ☐ Unk

Pump Capacity (GPM)	Casing Size (In)	Date Drilled:	Well Depth (Ft)	Casing Depth (Ft)	Grout Depth(Ft)	Static Water Depth (Ft)
725 ☐ Unk	12 ☐ Unk	7/9/1976 ☐ Unk	323 ☐ Unk	256 ☐ Unk	20 ☐ Unk	176 ☐ Unk

Is the Casing Screened?	Screen Depth (Ft): ☑ N/A ☐ Unk	Is the Casing Perforated?	Perforation Depth (Ft): ☑ N/A
☐ Yes ☑ No ☐ Unk ☐ N/A	From: To:	☐ Yes ☑ No ☐ Unk ☐ N/A	From: ☐ Unk To:

Latitude (Decimal):

Longitude (Decimal):

All Sources

1. This source is:
   ☑ Active ☐ Proposed
   ☐ Inactive ☐ Emergency (<60 days per year)

yes	no	n/a	unk	note	Question
☑	☐	☐	☐	☐	2. Has there been a Source Water Assessment conducted for the source? Date:
☑	☐	☐	☐	☐	3. Has a final GWUDI determination been done for this source? Date: 8/20/2002

☐ N/A 4-36 if source is a spring

WELL INFORMATION

yes	no	n/a	unk	note	Question
☑	☐		☐	☐	4. Is the well on a separate lot that is large enough to provide a minimum distance of 50 feet between the well and the nearest property line? (applicable if constructed after 11/1/77) ☐ Significant ☐ Deficiency
					Are the following minimum distances from the PWS well being met?
☑	☐		☐	☐	5. - Gravity sewer line....50 Ft.
☑	☐		☐	☐	6. - Pressure sewer line....100 Ft.
☑	☐		☐	☐	7. - Individual home septic tank....100 Ft.
☑	☐		☐	☐	8. - Individual home disposal field....100 Ft.
☑	☐		☐	☐	9. - Individual home seepage pit....100 Ft.
☑	☐		☐	☐	10. - Privies....100 Ft.
☑	☐		☐	☐	11. - Livestock....50 Ft.
☑	☐		☐	☐	12. - Canals, streams, ditches, lakes, ponds and tanks used to store nonpotable substances....50 Ft.
☐	☑		☐	☐	13. Are pesticides, herbicides, fertilizers, portable containers of petroleum products, or other toxic or hazardous materials stored on the well lot?
☐	☑		☐	☐	14. Are pesticides, herbicides, or fertilizers applied to the well lot?
☐	☑		☐	☐	15. Is the well in a pit? If yes, Date constructed:
☐	☐	☑	☐	☐	16. Was the well that is located in a pit installed after 11/5/64?
☐	☐	☑	☐	☐	17. If pit was installed prior to 11/5/64 – Has DEQ granted an exception and does the pit have water tight construction of pit walls and floor, a floor drain and an acceptable pit cover?
☐	☑	☐	☐	☐	18 Is the well protected from unauthorized entry? *(Recommended)*
☑	☐	☐	☐	☐	19. Does the casing extend a minimum of 18 inches above the final ground surface and/ or 12 inches above the pump house floor? ☐ Significant ☐ Deficiency
☐	☑	☐	☐	☐	20. Is the well vented with the open end of the vent screened and terminated downward at least 18 inches above the final ground surface?
☑	☐		☐	☐	21. Is the well provided with a sanitary cap that prevents surface water entry?
☑	☐		☐	☐	22. Is the well cased and sealed in such a manner that surface water cannot enter the well?

COMMENTS:
(Please indicate question number)

20. Vent must be installed

	Common Name	SURVEY DATE		PWS #
GROUNDWATER SOURCES - PG. 2	Well #3	5/7/2010	*(mm/dd/yyyy)*	7100020

yes	no	n/a	unk	note	**WELL INFORMATION (cont.)**
✓					23. Is there a smooth nosed sample tap provided on the well discharge pipe prior to treatment? (Threaded tap is approved with backflow preventer)
✓					24. Is an instantaneous and totalizing flow meter equipped with nonvolatile memory installed on the pump distribution line of the well and is it maintained and working properly? ____ gallons ☐ Unnecessary
✓					25. Is a pressure gauge provided at all installations and is it maintained and working properly? ____ psi.
✓					26. Can the well be pumped to waste at the design capacity of the well via an approved air gap at a location prior to the first service connection?

yes	no	n/a	unk	note	**PUMP HOUSE** *(Any structure containing important water system components)*
		✓			27. Is the source located in a pump house?
		✓			28. Is the pump house kept clean and in good repair? *(Floor cracks?)*
		✓			29. Is the pump house protected from unauthorized personnel?
		✓			30. Does the pump house have adequate lighting throughout? *(Recommended)*
		✓			31. Are all non-sample taps installed in the pump house equipped with an appropriate backflow prevention device?
		✓			32. Is adequate ventilation provided in the pump house for dissipation of excess heat and moisture from the equipment? ☐ Significant ☐ Deficiency
		✓			33. Is adequate heating provided in the pump house to provided safe and efficient operation of equipment to prevent freezing? ☐ Significant ☐ Deficiency
		✓			34. Is the pump house protected from flooding, have adequate drainage, is the floor surface at least six (6) inches above the final ground surface, and is the ground surface graded so as to lead surface water away from the pump house?
		✓			35. Is the sump for pump house floor drains closer than 30 feet from the well?
		✓			36. Is the floor drain connected to sewer, storm drains, chlorination room drains, or any other source of contamination?

yes	no	n/a	unk	note	**SPRING INFORMATION**
		✓			37. Is the entire area within a one hundred (100) foot radius of the spring box fenced to prevent trespassing of livestock and void of buildings, dwellings and sources of contamination?
		✓			38. Is surface water diverted from the 100 foot protection zone around the spring?
		✓			39. Is the spring housed in a permanent structure and protected from contamination including the entry of surface water, animals and dust?
		✓			40. Is there a smooth nosed sample tap provided on the spring discharge pipe prior to treatment? (Threaded tap is approved with backflow preventer)
		✓			41. Is a flow meter or other flow measuring device provided?

yes	no	n/a	unk	note	**SPRING BOX INFORMATION** *(Not all existing springs have a spring box)*
		✓			42. Is the spring box equipped with a screened overflow?
		✓			43. Is the supply intake located above the floor of the collection chamber?
		✓			44. Is the spring box protected from contamination including the entry of surface water, animals, and dust?
		✓			45. Is the access port fitted with a solid water tight cover which overlaps a framed opening and extended down around the frame at least 2 inches?
		✓			46. Is the access port a framed opening that is at least 4 inches high with a locking device?
		✓			47. Is the access port elevated at least twenty-four (24) inches above the top of the box or ground level, whichever is higher?

COMMENTS:
(Please indicate question number)

GROUNDWATER SOURCE - PG.1

A separate sources form must be filled out for **each** groundwater source in the PWS.

SURVEY DATE: 5/7/2010 *(mm/dd/yyyy)*

PWS #: 7100020

Tag #: 007146	Common Name of Source: Well #4	Source: [x] Well → [ ] Manifold; [ ] Spring → [ ] Spring Box	Is this Source Treated? [ ] Yes [x] No
Physical Location:			Treatment Objective: [x] N/A
			Treatment Types: [x] N/A *(Identify Treatment Train in Comments)*

Is there a well log for the groundwater source? [x] Yes [ ] No [ ] N/A [ ] Unk

Pump Capacity (GPM)	Casing Size (In)	Date Drilled:	Well Depth (Ft)	Casing Depth (Ft)	Grout Depth(Ft)	Static Water Depth (Ft)
740 [ ] Unk	12 [ ] Unk	10/31/1973 [ ] Unk	450 [ ] Unk	230 [ ] Unk	20 [ ] Unk	370 [ ] Unk

Is the Casing Screened?	Screen Depth (Ft): [x] N/A [ ] Unk	Is the Casing Perforated?	Perforation Depth (Ft): [x] N/A [ ] Unk
[ ] Yes [x] No [ ] Unk [ ] N/A	From: To:	[ ] Yes [ ] No [ ] Unk [x] N/A	From: To:

Latitude (Decimal):

Longitude (Decimal):

All Sources

1. This source is: [x] Active [ ] Proposed [ ] Inactive [ ] Emergency (<60 days per year)

yes	no	n/a	unk	note	Question
[x]	[ ]	[ ]	[ ]	[ ]	2. Has there been a Source Water Assessment conducted for the source? Date:
[x]	[ ]	[ ]	[ ]	[ ]	3. Has a final GWUDI determination been done for this source? Date: 8/20/2002

[ ] N/A 4-36 if source is a spring

WELL INFORMATION

yes	no	n/a	unk	note	Question
[x]	[ ]		[ ]	[ ]	4. Is the well on a separate lot that is large enough to provide a minimum distance of 50 feet between the well and the nearest property line? (applicable if constructed after 11/1/77) [ ] Significant [ ] Deficiency
					Are the following minimum distances from the PWS well being met?
[x]	[ ]		[ ]	[ ]	5. - Gravity sewer line....50 Ft.
[x]	[ ]		[ ]	[ ]	6. - Pressure sewer line....100 Ft.
[x]	[ ]		[ ]	[ ]	7. - Individual home septic tank....100 Ft.
[x]	[ ]		[ ]	[ ]	8. - Individual home disposal field....100 Ft.
[x]	[ ]		[ ]	[ ]	9. - Individual home seepage pit....100 Ft.
[x]	[ ]		[ ]	[ ]	10. - Privies....100 Ft.
[x]	[ ]		[ ]	[ ]	11. - Livestock....50 Ft.
[x]	[ ]		[ ]	[ ]	12. - Canals, streams, ditches, lakes, ponds and tanks used to store nonpotable substances....50 Ft.
[ ]	[x]		[ ]	[ ]	13. Are pesticides, herbicides, fertilizers, portable containers of petroleum products, or other toxic or hazardous materials stored on the well lot?
[ ]	[x]		[ ]	[ ]	14. Are pesticides, herbicides, or fertilizers applied to the well lot?
[ ]	[x]		[ ]	[ ]	15. Is the well in a pit? If yes, Date constructed:
[ ]	[ ]	[x]	[ ]	[ ]	16. Was the well that is located in a pit installed after 11/5/64?
[ ]	[ ]	[x]	[ ]	[ ]	17. If pit was installed prior to 11/5/64 – Has DEQ granted an exception and does the pit have water tight construction of pit walls and floor, a floor drain and an acceptable pit cover?
[ ]	[x]	[ ]	[ ]	[ ]	18 Is the well protected from unauthorized entry? *(Recommended)*
[x]	[ ]	[ ]	[ ]	[ ]	19. Does the casing extend a minimum of 18 inches above the final ground surface and/ or 12 inches above the pump house floor? [ ] Significant [ ] Deficiency
[x]	[ ]	[ ]	[ ]	[ ]	20. Is the well vented with the open end of the vent screened and terminated downward at least 18 inches above the final ground surface?
[x]	[ ]		[ ]	[ ]	21. Is the well provided with a sanitary cap that prevents surface water entry?
[x]	[ ]		[ ]	[ ]	22. Is the well cased and sealed in such a manner that surface water cannot enter the well?

COMMENTS:
(Please indicate question number)

Page ______ Of ______

GROUNDWATER SOURCES - PG. 2	Common Name	SURVEY DATE		PWS #
	Well #4	5/7/2010	(mm/dd/yyyy)	7100020

WELL INFORMATION (cont.)

yes	no	n/a	unk	note	Question
✓					23 Is there a smooth nosed sample tap provided on the well discharge pipe prior to treatment? (Threaded tap is approved with backflow preventer)
	✓	✓			24. Is an instantaneous and totalizing flow meter equipped with nonvolatile memory installed on the pump distribution line of the well and is it maintained and working properly? [ ] gallons
✓					25. Is a pressure gauge provided at all installations and is it maintained and working properly? [ ] psi.
✓					26. Can the well be pumped to waste at the design capacity of the well via an approved air gap at a location prior to the first service connection?

PUMP HOUSE *(Any structure containing important water system components)*

yes	no	n/a	unk	note	Question
	✓				27. Is the source located in a pump house?
✓					28. Is the pump house kept clean and in good repair? *(Floor cracks?)*
		✓			29. Is the pump house protected from unauthorized personnel?
		✓			30. Does the pump house have adequate lighting throughout? *(Recommended)*
		✓			31 Are all non-sample taps installed in the pump house equipped with an appropriate backflow prevention device?
		✓			32. Is adequate ventilation provided in the pump house for dissipation of excess heat and moisture from the equipment? ☐ Significant ☐ Deficiency
		✓			33. Is adequate heating provided in the pump house to provided safe and efficient operation of equipment to prevent freezing? ☐ Significant ☐ Deficiency
		✓			34. Is the pump house protected from flooding, have adequate drainage, is the floor surface at least six (6) inches above the final ground surface, and is the ground surface graded so as to lead surface water away from the pump house?
		✓			35. Is the sump for pump house floor drains closer than 30 feet from the well?
		✓			36. Is the floor drain connected to sewer, storm drains, chlorination room drains, or any other source of contamination?

SPRING INFORMATION

yes	no	n/a	unk	note	Question
		✓			37. Is the entire area within a one hundred (100) foot radius of the spring box fenced to prevent trespassing of livestock and void of buildings, dwellings and sources of contamination?
		✓			38. Is surface water diverted from the 100 foot protection zone around the spring?
		✓			39. Is the spring housed in a permanent structure and protected from contamination including the entry of surface water, animals and dust?
		✓			40. Is there a smooth nosed sample tap provided on the spring discharge pipe prior to treatment? (Threaded tap is approved with backflow preventer)
		✓			41. Is a flow meter or other flow measuring device provided?

SPRING BOX INFORMATION *(Not all existing springs have a spring box)*

yes	no	n/a	unk	note	Question
		✓			42. Is the spring box equipped with a screened overflow?
		✓			43. Is the supply intake located above the floor of the collection chamber?
		✓			44. Is the spring box protected from contamination including the entry of surface water, animals, and dust?
		✓			45. Is the access port fitted with a solid water tight cover which overlaps a framed opening and extended down around the frame at least 2 inches?
		✓			46. Is the access port a framed opening that is at least 4 inches high with a locking device?
		✓			47. Is the access port elevated at least twenty-four (24) inches above the top of the box or ground level, whichever is higher?

COMMENTS:
(Please indicate question number)

24. Meter not working at time of inspection

Page ______ Of ______

GROUNDWATER SOURCE - PG.1

A separate sources form must be filled out for **each** groundwater source in the PWS.

SURVEY DATE		PWS #
5/7/2010	*(mm/dd/yyyy)*	7100020

Tag #:	Common Name of Source:	Source	Is this Source Treated? [ ] Yes [x] No
J008063	Well #5	[x] Well → [ ] Manifold [ ] Spring → [ ] Spring Box	Treatment Objective: [x] N/A
Physical Location:			Treatment Types: [x] N/A *(Identify Treatment Train in Comments)*

Is there a well log for the groundwater source? [x] Yes [ ] No [ ] N/A [ ] Unk

Pump Capacity (GPM)	Casing Size (In)	Date Drilled:	Well Depth (Ft)	Casing Depth (Ft)	Grout Depth(Ft)	Static Water Depth (Ft)
1200 [ ] Unk	16 [ ] Unk	6/9/1997 [ ] Unk	520 [ ] Unk	510 [ ] Unk	340 [ ] Unk	312 [ ] Unk

Is the Casing Screened?	Screen Depth (Ft): [x] N/A [ ] Unk	Is the Casing Perforated?	Perforation Depth (Ft): [ ] N/A [ ] Unk
[ ] Yes [x] No [ ] Unk [ ] N/A	From: To:	[x] Yes [ ] No [ ] Unk [ ] N/A	From: 340 To: 510

Latitude (Decimal):

Longitude (Decimal):

COMMENTS:
(Please indicate question number)

All Sources

1. This source is:
[x] Active [ ] Proposed
[ ] Inactive [ ] Emergency (<60 days per year)

yes	no	n/a	unk	note	Question
[x]	[ ]	[ ]	[ ]	[ ]	2. Has there been a Source Water Assessment conducted for the source? Date:
[x]	[ ]	[ ]	[ ]	[ ]	3. Has a final GWUDI determination been done for this source? Date: 8/20/2002

[ ] N/A 4-36 if source is a spring

WELL INFORMATION

yes	no	n/a	unk	note	Question
[x]	[ ]		[ ]	[ ]	4. Is the well on a separate lot that is large enough to provide a minimum distance of 50 feet between the well and the nearest property line? (applicable if constructed after 11/1/77) [ ] Significant [ ] Deficiency
					Are the following minimum distances from the PWS well being met?
[x]	[ ]		[ ]	[ ]	5. - Gravity sewer line....50 Ft.
[x]	[ ]		[ ]	[ ]	6. - Pressure sewer line....100 Ft.
[x]	[ ]		[ ]	[ ]	7. - Individual home septic tank....100 Ft.
[x]	[ ]		[ ]	[ ]	8. - Individual home disposal field....100 Ft.
[x]	[ ]		[ ]	[ ]	9. - Individual home seepage pit....100 Ft.
[x]	[ ]		[ ]	[ ]	10. - Privies....100 Ft.
[x]	[ ]		[ ]	[ ]	11. - Livestock....50 Ft.
[x]	[ ]		[ ]	[ ]	12. - Canals, streams, ditches, lakes, ponds and tanks used to store nonpotable substances....50 Ft.
[ ]	[x]		[ ]	[ ]	13. Are pesticides, herbicides, fertilizers, portable containers of petroleum products, or other toxic or hazardous materials stored on the well lot?
[ ]	[x]		[ ]	[ ]	14 Are pesticides, herbicides, or fertilizers applied to the well lot?
[ ]	[x]		[ ]	[ ]	15 Is the well in a pit? If yes, Date constructed:
[ ]	[ ]	[x]	[ ]	[ ]	16. Was the well that is located in a pit installed after 11/5/64?
[ ]	[ ]	[x]	[ ]	[ ]	17 If pit was installed prior to 11/5/64 – Has DEQ granted an exception and does the pit have water tight construction of pit walls and floor, a floor drain and an acceptable pit cover?
[ ]	[x]	[ ]	[ ]	[ ]	18 Is the well protected from unauthorized entry? *(Recommended)*
[x]	[ ]	[ ]	[ ]	[ ]	19. Does the casing extend a minimum of 18 inches above the final ground surface and/ or 12 inches above the pump house floor? [ ] Significant [ ] Deficiency
[x]	[ ]	[ ]	[ ]	[ ]	20. Is the well vented with the open end of the vent screened and terminated downward at least 18 inches above the final ground surface?
[x]	[ ]		[ ]	[ ]	21. Is the well provided with a sanitary cap that prevents surface water entry?
[x]	[ ]		[ ]	[ ]	22. Is the well cased and sealed in such a manner that surface water cannot enter the well?

GROUNDWATER SOURCES - PG. 2

Common Name	SURVEY DATE		PWS #
Well #5	5/7/2010	(mm/dd/yyyy)	7100020

COMMENTS:
(Please indicate question number)

23. Backflow preventer needed.

WELL INFORMATION (cont.)

yes	no	n/a	unk	note	
	✓				23. Is there a smooth nosed sample tap provided on the well discharge pipe prior to treatment? (Threaded tap is approved with backflow preventer)
✓					24. Is an instantaneous and totalizing flow meter equipped with nonvolatile memory installed on the pump distribution line of the well and is it maintained and working properly? ☐ Unnecessary ____ gallons
✓					25. Is a pressure gauge provided at all installations and is it maintained and working properly? ____ psi.
✓					26. Can the well be pumped to waste at the design capacity of the well via an approved air gap at a location prior to the first service connection?

PUMP HOUSE *(Any structure containing important water system components)*

yes	no	n/a	unk	note	
	✓				27. Is the source located in a pump house?
✓					28. Is the pump house kept clean and in good repair? *(Floor cracks?)*
		✓			29. Is the pump house protected from unauthorized personnel?
		✓			30. Does the pump house have adequate lighting throughout? *(Recommended)*
		✓			31. Are all non-sample taps installed in the pump house equipped with an appropriate backflow prevention device?
		✓			32. Is adequate ventilation provided in the pump house for dissipation of excess heat and moisture from the equipment? ☐ Significant ☐ Deficiency
		✓			33. Is adequate heating provided in the pump house to provided safe and efficient operation of equipment to prevent freezing? ☐ Significant ☐ Deficiency
		✓			34. Is the pump house protected from flooding, have adequate drainage, is the floor surface at least six (6) inches above the final ground surface, and is the ground surface graded so as to lead surface water away from the pump house?
		✓			35. Is the sump for pump house floor drains closer than 30 feet from the well?
		✓			36 Is the floor drain connected to sewer, storm drains, chlorination room drains, or any other source of contamination?

SPRING INFORMATION

yes	no	n/a	unk	note	
		✓			37. Is the entire area within a one hundred (100) foot radius of the spring box fenced to prevent trespassing of livestock and void of buildings, dwellings and sources of contamination?
		✓			38. Is surface water diverted from the 100 foot protection zone around the spring?
		✓			39. Is the spring housed in a permanent structure and protected from contamination including the entry of surface water, animals and dust?
		✓			40. Is there a smooth nosed sample tap provided on the spring discharge pipe prior to treatment? (Threaded tap is approved with backflow preventer)
		✓			41. Is a flow meter or other flow measuring device provided?

SPRING BOX INFORMATION *(Not all existing springs have a spring box)*

yes	no	n/a	unk	note	
		✓			42. Is the spring box equipped with a screened overflow?
		✓			43. Is the supply intake located above the floor of the collection chamber?
		✓			44 Is the spring box protected from contamination including the entry of surface water, animals, and dust?
		✓			45. Is the access port fitted with a solid water tight cover which overlaps a framed opening and extended down around the frame at least 2 inches?
		✓			46. Is the access port a framed opening that is at least 4 inches high with a locking device?
		✓			47. Is the access port elevated at least twenty-four (24) inches above the top of the box or ground level, whichever is higher?

GROUNDWATER SOURCE - PG.1

SURVEY DATE: 5/7/2010 (mm/dd/yyyy) | PWS #: 7100020

A separate sources form must be filled out for **each** groundwater source in the PWS.

Tag #:	[redacted]
Common Name of Source:	Well #6
Source:	[redacted] ☑ Well → ☐ Manifold; ☐ Spring → ☐ Spring Box
Physical Location:	[redacted]
Is this Source Treated?	☐ Yes ☑ No
Treatment Objective:	☑ N/A
Treatment Types:	☑ N/A

(Identify Treatment Train in Comments)

Is there a well log for the groundwater source? ☐ Yes ☑ No ☐ N/A ☐ Unk

Pump Capacity (GPM)	Casing Size (In)	Date Drilled:	Well Depth (Ft)	Casing Depth (Ft)	Grout Depth(Ft)	Static Water Depth (Ft)
1500 ☐ Unk	16 ☐ Unk	1/27/2006 ☐ Unk	407 ☐ Unk	308 ☐ Unk	237 ☐ Unk	252 ☐ Unk

Is the Casing Screened? ☐ Yes ☑ No ☐ Unk ☐ N/A

Screen Depth (Ft): ☑ N/A ☐ Unk From: To:

Is the Casing Perforated? ☑ Yes ☐ No ☐ Unk ☐ N/A

Perforation Depth (Ft): ☐ N/A ☐ Unk From: 308 To: 408

Latitude (Decimal):

Longitude (Decimal):

All Sources

1. This source is: ☑ Active ☐ Proposed ☐ Inactive ☐ Emergency (<60 days per year)

yes	no	n/a	unk	note	Question
☐	☐	☐	☑	☐	2. Has there been a Source Water Assessment conducted for the source? Date:
☐	☐	☐	☑	☐	3. Has a final GWUDI determination been done for this source? Date:

☐ N/A 4-36 if source is a spring

WELL INFORMATION

yes	no	n/a	unk	note	Question
☑	☐		☐	☐	4. Is the well on a separate lot that is large enough to provide a minimum distance of 50 feet between the well and the nearest property line? (applicable if constructed after 11/1/77) ☐ Significant ☐ Deficiency
					Are the following minimum distances from the PWS well being met?
☑	☐		☐	☐	5. - Gravity sewer line....50 Ft.
☑	☐		☐	☐	6. - Pressure sewer line....100 Ft.
☑	☐		☐	☐	7. - Individual home septic tank....100 Ft.
☑	☐		☐	☐	8. - Individual home disposal field....100 Ft.
☑	☐		☐	☐	9. - Individual home seepage pit....100 Ft.
☑	☐		☐	☐	10. - Privies....100 Ft.
☑	☐		☐	☐	11. - Livestock....50 Ft.
☑	☐		☐	☐	12. - Canals, streams, ditches, lakes, ponds and tanks used to store nonpotable substances....50 Ft.
☐	☑		☐	☐	13 Are pesticides, herbicides, fertilizers, portable containers of petroleum products, or other toxic or hazardous materials stored on the well lot?
☐	☑		☐	☐	14. Are pesticides, herbicides, or fertilizers applied to the well lot?
☐	☑		☐	☐	15. Is the well in a pit? If yes, Date constructed:
☐	☐	☑	☐	☐	16. Was the well that is located in a pit installed after 11/5/64?
☐	☐	☑	☐	☐	17 If pit was installed prior to 11/5/64 – Has DEQ granted an exception and does the pit have water tight construction of pit walls and floor, a floor drain and an acceptable pit cover?
☑	☐	☐	☐	☐	18 Is the well protected from unauthorized entry? *(Recommended)*
☑	☐	☐	☐	☐	19. Does the casing extend a minimum of 18 inches above the final ground surface and/ or 12 inches above the pump house floor? ☐ Significant ☐ Deficiency
☑	☐	☐	☐	☐	20. Is the well vented with the open end of the vent screened and terminated downward at least 18 inches above the final ground surface?
☑	☐		☐	☐	21. Is the well provided with a sanitary cap that prevents surface water entry?
☑	☐		☐	☐	22. Is the well cased and sealed in such a manner that surface water cannot enter the well?

COMMENTS:
(Please indicate question number)

Page ______ Of ______

GROUNDWATER SOURCES - PG. 2	Common Name	SURVEY DATE		PWS #
	Well #6	5/7/2010	(mm/dd/yyyy)	7100020

COMMENTS:
(Please indicate question number)

yes	no	n/a	unk	note	**WELL INFORMATION (cont.)**
☑	☐	☐	☐	☐	23. Is there a smooth nosed sample tap provided on the well discharge pipe prior to treatment? (Threaded tap is approved with backflow preventer)
☑	☐	☐	☐	☐	24 Is an instantaneous and totalizing flow meter equipped with nonvolatile memory installed on the pump distribution line of the well and is it maintained and working properly? [ ] gallons
		☐ Unnecessary			
☑	☐	☐	☐	☐	25. Is a pressure gauge provided at all installations and is it maintained and working properly? [ ] psi.
☑	☐	☐	☐	☐	26. Can the well be pumped to waste at the design capacity of the well via an approved air gap at a location prior to the first service connection?

yes	no	n/a	unk	note	**PUMP HOUSE** *(Any structure containing important water system components)*
☑	☐	☐	☐	☐	27. Is the source located in a pump house?
☑	☐	☐	☐	☐	28. Is the pump house kept clean and in good repair? *(Floor cracks?)*
☑	☐	☐	☐	☐	29. Is the pump house protected from unauthorized personnel?
☑	☐	☐	☐	☐	30. Does the pump house have adequate lighting throughout? *(Recommended)*
☑	☐	☐	☐	☐	31. Are all non-sample taps installed in the pump house equipped with an appropriate backflow prevention device?
☑	☐	☐	☐	☐	32. Is adequate ventilation provided in the pump house for dissipation of excess heat and moisture from the equipment?
☐ Significant		☐ Deficiency			
☑	☐	☐	☐	☐	33. Is adequate heating provided in the pump house to provided safe and efficient operation of equipment to prevent freezing?
☐ Significant		☐ Deficiency			
☑	☐	☐	☐	☐	34. Is the pump house protected from flooding, have adequate drainage, is the floor surface at least six (6) inches above the final ground surface, and is the ground surface graded so as to lead surface water away from the pump house?
☐	☑	☐	☐	☐	35. Is the sump for pump house floor drains closer than 30 feet from the well?
☐	☑	☐	☐	☐	36. Is the floor drain connected to sewer, storm drains, chlorination room drains, or any other source of contamination?

yes	no	n/a	unk	note	**SPRING INFORMATION**
☐	☐	☑	☐	☐	37. Is the entire area within a one hundred (100) foot radius of the spring box fenced to prevent trespassing of livestock and void of buildings, dwellings and sources of contamination?
☐	☐	☑	☐	☐	38. Is surface water diverted from the 100 foot protection zone around the spring?
☐	☐	☑	☐	☐	39. Is the spring housed in a permanent structure and protected from contamination including the entry of surface water, animals and dust?
☐	☐	☑	☐	☐	40. Is there a smooth nosed sample tap provided on the spring discharge pipe prior to treatment? (Threaded tap is approved with backflow preventer)
☐	☐	☑	☐	☐	41. Is a flow meter or other flow measuring device provided?

yes	no	n/a	unk	note	**SPRING BOX INFORMATION** *(Not all existing springs have a spring box)*
☐	☐	☑	☐	☐	42. Is the spring box equipped with a screened overflow?
☐	☐	☑	☐	☐	43. Is the supply intake located above the floor of the collection chamber?
☐	☐	☑	☐	☐	44. Is the spring box protected from contamination including the entry of surface water, animals, and dust?
☐	☐	☑	☐	☐	45. Is the access port fitted with a solid water tight cover which overlaps a framed opening and extended down around the frame at least 2 inches?
☐	☐	☑	☐	☐	46. Is the access port a framed opening that is at least 4 inches high with a locking device?
☐	☐	☑	☐	☐	47. Is the access port elevated at least twenty-four (24) inches above the top of the box or ground level, whichever is higher?

STORAGE

SURVEY DATE: 5/7/2010 (mm/dd/yyyy) PWS # 7100020

A separate storage form must be filled out for each storage unit in the PWS.

		COMMENTS: (Please indicate question number)
Storage Structure Name: Old Storage Tank	Storage Structure ID #:	
Physical Location:	Date in service: ☐ Unk 1974	
	Volume (gal): ☐ Unk 100,000	
Storage Type: ☑ Reservoir/Tank ☐ Standpipe	Construction: ☐ Elevated ☑ Above Ground ☐ Partially Below Ground ☐ Below Ground	
Type of material: ☐ Plastic ☐ Fiberglass ☑ Concrete ☐ Wood ☐ Metal ☐ Naturally Contained		
Total Days Supply (This structure): 1/2 day ☐ Unk	Date Last: Inspected: ☐ Unk Cleaned: ☐ Unk	
How is the water level measured? ☐ Unk Floats/telemetry		

ALL STORAGE STRUCTURES

yes	no	n/a	unk	note	Question
☑	☐	☐	☐	☐	1. Is the storage structure safely accessible to the inspector?
☐	☑	☐	☐	☐	2. Is the PWS storage tank located within 500 feet of any municipal or Industrial wastewater treatment plant or any land which is spray irrigated with wastewater or used for sludge disposal?
☐	☑	☐	☐	☐	3. Are any of the storage structure drains directly connected to a sewer or storm drain?
☑	☐	☐	☐	☐	4. Is an overflow provided that discharges to daylight in a way that will preclude the possibility of backflow to the reservoir and, where practical, provided with an expanded metal screen installed within the pipe that will exclude rodents and deter vandalism?
☑	☐	☐	☐	☐	5. Are overflows brought down to an elevation between 12 and 24 inches above the ground surface? *(2X the diameter of the discharge pipe above a basin rim)*
☑	☐	☐	☐	☐	6. Do overflows discharge over a drainage inlet structure or splash plate?(storm or sanitary)
☑	☐	☐	☐	☐	7. Is the storage structure secure from unauthorized access?
☑	☐	☐	☐	☐	8. Does the storage reservoir have a watertight roof or cover and is it sloped to facilitate drainage?
☑	☐	☐	☐	☐	9. Is the storage water protected from contamination?
☑	☐	☐	☐	☐	10. Is the storage structure structurally sound?
☐	☑	☐	☐	☐	11. Could vegetation in the area potentially impact the storage structure?*(Recommended)*
☑	☐	☐	☐	☐	12. Is the storage structure designed so that it can be isolated from the distribution system without necessitating loss of pressure in the distribution system?
☐	☑	☐	☐	☐	13. Is leakage evident at time of inspection?
☐	☐	☐	☑	☐	14. Is the storage structure interior coating or liner peeling or cracked?
☑	☐	☐	☐	☐	15. Is the storage structure used to store finished water?
☐	☐	☐	☑	☐	16 Are access manhole openings for the storage structure 4 inches or greater above the surface of the roof, with a cover 2 inches overlapping, water tight, hinged and locked?
☐	☐	☐	☑	☐	17. Are all vents extended 12 inches above the roof and constructed to exclude potential sources of contamination? *(The overflow pipe shall not be considered a vent)*

ABOVE GROUND STORAGE

yes	no	n/a	unk	note	Question
☑	☐	☐	☐	☐	18 Do all vents open downward and are they fitted with a 4 mesh non-corrodible screen?

GROUND-LEVEL, PARTIALLY BURIED, or BELOW-GROUND STORAGE

yes	no	n/a	unk	note	Question
☐	☐	☑	☐	☐	19. Does the overflow for the storage structure have a vertical section of pipe at least 2 pipe diameters in length?
☐	☐	☑	☐	☐	20. Is the overflow for the storage structure provided with either a 24 mesh non-corrodible screen installed within the pipe when practical, or an expanded metal screen installed within the pipe plus a weighted flapper or check?
☐	☐	☑	☐	☐	21. Is the area surrounding the storage structure graded in a manner that will prevent surface water from standing within 50 feet of it?
☐	☐	☑	☐	☐	22. Are all vents for the storage structure open downward with the opening at least 24 inches above the roof or the ground level and covered with 24 mesh non-corrodible screen to exclude potential contamination?

PARTIALLY BURIED OR BELOW-GROUND STORAGE

yes	no	n/a	unk	note	Question
☐	☐	☑	☐	☐	23. Are "ALL" manholes elevated 24 inches above the surface of the roof or the ground level, which ever is higher?
☐	☐	☑	☐	☐	24. Is there a minimum distance of 50 feet between the storage structure and any non-potable main, standing water, or other possible source of contamination?

STORAGE

SURVEY DATE: 5/7/2010 *(mm/dd/yyyy)* PWS #: 7100020

A separate storage form must be filled out for each storage unit in the PWS.

Storage Structure Name: New Storage Tank	Storage Structure ID #:	**COMMENTS:** (Please indicate question number)
Physical Location:	Date in service: ☐ Unk 2003 Volume (gal): ☐ Unk 200,000	
Storage Type: ☑ Reservoir/Tank ☐ Standpipe	Construction: ☐ Elevated ☑ Above Ground ☐ Partially Below Ground ☐ Below Ground	Type of material: ☐ Plastic ☐ Wood ☐ Fiberglass ☑ Metal ☐ Concrete ☐ Naturally Contained
Total Days Supply (This structure): 1 day ☐ Unk	Date Last: Inspected: ☐ Unk	Cleaned: ☐ Unk
How is the water level measured? ☐ Unk Floats inside move a meter outside of tank		

yes	no	n/a	unk	note	ALL STORAGE STRUCTURES
☑	☐	☐	☐	☐	1. Is the storage structure safely accessible to the inspector?
☐	☑	☐	☐	☐	2. Is the PWS storage tank located within 500 feet of any municipal or industrial wastewater treatment plant or any land which is spray irrigated with wastewater or used for sludge disposal?
☐	☑	☐	☐	☐	3. Are any of the storage structure drains directly connected to a sewer or storm drain?
☑	☐	☐	☐	☐	4. Is an overflow provided that discharges to daylight in a way that will preclude the possibility of backflow to the reservoir and, where practical, provided with an expanded metal screen installed within the pipe that will exclude rodents and deter vandalism?
☑	☐	☐	☐	☐	5. Are overflows brought down to an elevation between 12 and 24 inches above the ground surface? *(2X the diameter of the discharge pipe above a basin rim)*
☑	☐	☐	☐	☐	6. Do overflows discharge over a drainage inlet structure or splash plate?(storm or sanitary)
☑	☐	☐	☐	☐	7. Is the storage structure secure from unauthorized access?
☑	☐	☐	☐	☐	8. Does the storage reservoir have a watertight roof or cover and is it sloped to facilitate drainage?
☑	☐	☐	☐	☐	9. Is the storage water protected from contamination?
☑	☐	☐	☐	☐	10. Is the storage structure structurally sound?
☐	☑	☐	☐	☐	11. Could vegetation in the area potentially impact the storage structure?*(Recommended)*
☑	☐	☐	☐	☐	12. Is the storage structure designed so that it can be isolated from the distribution system without necessitating loss of pressure in the distribution system?
☐	☑	☐	☐	☐	13. Is leakage evident at time of inspection?
☐	☐	☐	☑	☐	14. Is the storage structure interior coating or liner peeling or cracked?
☑	☐	☐	☐	☐	15. Is the storage structure used to store finished water?
☑	☐	☐	☐	☐	16. Are access manhole openings for the storage structure 4 inches or greater above the surface of the roof, with a cover 2 inches overlapping, water tight, hinged and locked?
☑	☐	☐	☐	☐	17. Are all vents extended 12 inches above the roof and constructed to exclude potential sources of contamination? *(The overflow pipe shall not be considered a vent)*

yes	no	n/a	unk	note	ABOVE GROUND STORAGE
☑	☐	☐	☐	☐	18 Do all vents open downward and are they fitted with a 4 mesh non-corrodible screen?

yes	no	n/a	unk	note	GROUND-LEVEL, PARTIALLY BURIED, or BELOW-GROUND STORAGE
☐	☐	☑	☐	☐	19. Does the overflow for the storage structure have a vertical section of pipe at least 2 pipe diameters in length?
☐	☐	☑	☐	☐	20. Is the overflow for the storage structure provided with either a 24 mesh non-corrodible screen installed within the pipe when practical, or an expanded metal screen installed within the pipe plus a weighted flapper or check?
☐	☐	☑	☐	☐	21 Is the area surrounding the storage structure graded in a manner that will prevent surface water from standing within 50 feet of it?
☐	☐	☑	☐	☐	22. Are all vents for the storage structure open downward with the opening at least 24 inches above the roof or the ground level and covered with 24 mesh non-corrodible screen to exclude potential contamination?

yes	no	n/a	unk	note	PARTIALLY BURIED OR BELOW-GROUND STORAGE
☐	☐	☑	☐	☐	23. Are "ALL" manholes elevated 24 inches above the surface of the roof or the ground level, which ever is higher?
☐	☐	☑	☐	☐	24 Is there a minimum distance of 50 feet between the storage structure and any non-potable main, standing water, or other possible source of contamination?

DISTRIBUTION

SURVEY DATE: 5/7/2010 (mm/dd/yyyy) PWS #: 7100020

One form for all distribution systems in the PWS.

What are water lines made of:

Material(s): ☐ Unk

☐ Steel ☐ HDPE (black) ☐ Asbestos/Cement

☑ PVC ☐ Ductile Iron ☐ Copper

☐ Other:

Size(s): ☐ Unk

6-inch; 8-inch; 10-inch; 12-inch

How many services are metered?

0 out of

Number of Fire Hydrants:

90-100

COMMENTS:
(Please indicate the question number)

yes	no	n/a	unk	note	DISTRIBUTION
☐	☑	☐	☐	☐	1. Have there been any interruptions in service during the past year? (including pressure loss)
☐	☑	☐	☐	☐	2. If a loss of pressure occurred (>20 psi), did the PWS provide public notice and disinfect the system? *(Reminder)*
☑	☐	☐	☐	☐	3. Is the PWS able to maintain a minimum pressure of twenty (20) psi throughout the distribution system (including fire flow), or forty (40) psi for PWSs constructed after 7/1/1985 (excluding fire flow), during maximum hourly demand conditions?
☐	☐	☑	☐	☐	4. Was the pressure observed at a service connection?

5. If yes: ____ psi.

Location:

Time: ____ ☐ A.M. ☐ P.M.

yes	no	n/a	unk	note	
☑	☐	☐	☐	☐	6. Do all water mains that provide fire flow have a diameter of at least 6 inches?
☑	☐	☐	☐	☐	7. Are valves exercised regularly? *(Recommended)* If yes, how often?
☑	☐	☐	☐	☐	8. Is there a leak detection program? *(Recommended)*
☐	☐	☐	☑	☐	9. Is 15% or more of the water unaccounted for?
☐	☑	☐	☐	☐	10. Is a water conservation program in effect? *(Recommended)*
☑	☐	☐	☐	☐	11. Is an adequate map of the distribution system maintained? *(Recommended)*
☑	☐	☐	☐	☐	12. Does the system flush all main lines annually? *(Recommended)*
☐	☐	☑	☐	☐	13. Are all dead end water mains equipped with a means to flush?
☐	☐	☑	☐	☐	14. If yes, are the deadends flushed at least semiannually?
☐	☑	☐	☐	☐	15. Are there any distribution materials used that should not be in contact with the drinking water? *If yes, explain in comments section.*
☑	☐	☐	☐	☐	16. Is the system adequately protected from freezing?
☐	☑	☐	☐	☐	17. Is there a cross connection control program? *(Community PWSs Only)*
☑	☐	☐	☐	☐	18. Is the operator trained in cross connection control? *(Recommended)*
☐	☑	☐	☐	☐	19. Is the operator aware of any cross connections or were any cross connections observed during the course of the survey?
☐	☐	☑	☐	☐	20. If a separate non-potable irrigation system is provided for the consumer, are all mains, hydrants, and appurtenances easily identified as non-potable? (Purple Tape or other) *(Recommended)*

yes	no	n/a	unk	note	**Air/Vacuum Relief Valves** - *Placed at high points in water mains.*
☐	☐	☑	☐	☐	21. Are all automatic air relief valves equipped with a means of backflow protection?

PUMPING - PG. 1

One form for all Pumps.

SURVEY DATE: 5/7/2010 (mm/dd/yyyy)

PWS #: 7100020

PUMPS, PUMPHOUSES, AND CONTROLS						
[illegible]	Physical Location:	Type of Pump:	Brand:	Model:	Horsepower:	Purpose:
1-4	Sagewood Booster Station	Centrifugal	Goulds	3656	10	Booster pumps
5	Ensenada	Centrifugal	Goulds	3656	3	Booster pumps
6-8	Middle Fork Booster Station	Centrifugal	Goulds	7AI/BF	30	Booster pumps
9	Well #2	Submersible	Goulds	6 CHC-8	40	well pump
10	Well #3	Submersible	Goulds	8 RJHC	125	well pump
11	Well #4	Submersible	Goulds	8 RJHC	125	well pump
12	Well #5	Submersible	Goulds	9 RJHC	200	Well pump
13	Well #6	Vertical Turbine	Nema	7322 BEM	300	well pump

ALL PUMPS

yes	no	n/a	unk	note	
☑	☐	☐	☐	☐	1. Are all pumps capable of providing the maximum pumping demand of the system?
☐	☑	☐	☐	☐	2. Does the pump(s) cycle excessively? *(Recommended)*
☑	☐	☐	☐	☐	3. Are all pumps provided with readily available spare parts and tools?
☑	☐	☐	☐	☑	4. Is a water pressure relief valve installed where the pump is directly connected to the distribution system?
☑	☐	☐	☐	☐	5. Is a standard pressure gauge installed on the discharge line?

WELL PUMPS

yes	no	n/a	unk	note	
☑	☐	☐	☐	☐	6. Is there an accessible check valve installed in the discharge line of each well between the pump and the shut-off valve?
☑	☐	☐	☐	☐	7. If the system has a vertical turbine motor driven pump(s), is an air release-vacuum relief valve located upstream from the check valve, with exhaust/relief piping terminating in a down-turned position at least 18 inches above the floor and covered with a 24 mesh corrosion resistant screen?
☑	☐	☐	☐	☐	8. If the pump(s) is "oil lubricated", is the oil NSF approved and suitable for human consumption?

WATER PUMPS *(not well pumps)*

yes	no	n/a	unk	note	
☑	☐	☐	☐	☐	9. Is an accessible check valve on the discharge side between the pump and the shut-off valve?

AUXILIARY POWER

yes	no	n/a	unk	note	
☐	☑		☐	☐	10. Is there auxiliary power on-site? PWS built before rule required auxiliary power
☐ Significant	☑ [redacted]				
☐	☐	☑	☐	☐	11. Is auxiliary power tested? *(Recommended)*
☐	☐	☑	☐	☐	12. If a diesel or gasoline fueled engine is used on the well lot; is the fuel tank and connecting piping double walled?
☐	☐	☑	☐	☐	13. Is the fuel tank above ground?
☐	☐	☑	☐	☐	14. Is a certified operator present during the filling of the fuel tank?
					If the engine is in the well house
☐	☐	☑	☐	☐	15. Is the engine exhaust directly discharged outside the well house?
☐	☐	☑	☐	☐	16. Is a spill containment structure surrounding all fuel tanks adequate? *(Secondary containment - 110% fuel tank volume)*
					Community Systems Only
☐	☐	☑	☐	☐	17. *(Community Systems built after 4/15/07 only)* Is on-site power or standby storage provided so water can be treated and supplied to pressurize the entire distribution system during a power outage for a minimum of 8 hours?
☐	☐	☑	☐	☐	18. *(Community Systems built after 4/15/07 only)* If standby power is provided, Is there a minimum of 8 hours of fuel stored and located on site?

COMMENTS:
(Please indicate the question number)

4. Pressure relief valve is missing at the Middle Fork Booster Station

PUMPING - PG. 2

SURVEY DATE: 5/7/2010 (mm/dd/yyyy) PWS #: 7100020

COMMENTS: (Please indicate the question number)

yes	no	n/a	unk	note	BOOSTER PUMPS
☐	☐	☐	☑	☐	19. Is an instantaneous and totalizing flow meter installed where the booster pump is directly connected to the distribution system?
		☐ Unnecessary			
☑	☐	☐	☐	☐	20. Are all in-line booster pumps supplied with an automatic cutoff that activates when intake pressure is less than or equal to 5 psi?
☑	☐	☐	☐	☐	21. Is the booster pump located on a suction line that is directly connected to any storage reservoir?
☑	☐	☐	☐	☐	22. If yes, are all booster pumps protected by an automatic cutoff to prevent pump damage and avoid excessive reservoir drawdown?

yes	no	n/a	unk	note	**PUMP HOUSE** *(Only pump houses that don't contain a Groundwater Source)*
☐	☐	☑	☐	☐	23. Is the pump house kept clean and in good repair? *(Floor cracks?)*
☐	☐	☑	☐	☐	24. Is the pump house protected from unauthorized personnel?
☐	☐	☑	☐	☐	25. Does the pump house have adequate lighting throughout? *(Recommended)*
☐	☐	☑	☐	☐	26. Are all non-sample taps installed in the pump house equipped with an appropriate backflow prevention device?
☐	☐	☑	☐	☐	27. Is adequate ventilation provided in the pump house for dissipation of excess heat and moisture from the equipment?
☐ Significant		☐ Deficiency			
☐	☐	☑	☐	☐	28. Is adequate heating provided in the pump house to provided safe and efficient operation of equipment *(prevent moisture buildup and/or freezing)* ?
☐ Significant		☐ Deficiency			
☐	☐	☑	☐	☐	29. Is the pump house protected from flooding, have adequate drainage, is the floor surface at least six (6) inches above the final ground surface, and is the ground surface graded so as to lead surface water away from the pump house?

yes	no	n/a	unk	note	
☐	☐	☑	☐	☐	30. Is the sump for pump house floor drains closer than 30 feet from the well?
☐	☐	☑	☐	☐	31. Is the floor drain connected to sewer, storm drains, chlorination room drains, or any other source of contamination?

FINANCIAL CAPACITY

SURVEY DATE		PWS #
5/7/2010	(mm/dd/yyyy)	7100020

yes	no	n/a	unk	note	FINANCIAL CAPACITY
☑	☐	☐	☐	☐	1. Is the PWS current with the payment of drinking water fees?
☑	☐	☐	☐	☐	2. Does the PWS charge a drinking water fee to the user? If yes, what is the fee: $ 50/mo + acreage
☐	☑	☐	☐	☐	3. Is the PWS in the business of selling water?
					#3 Note: - If no, identify why in the comments section and mark "N/A" on questions 4 - 19.
☑	☐	☐	☐	☐	4. Does the PWS provide and use an annual budget? *(Recommended)*
☐	☑	☐	☐	☐	5. If applicable, is the PWS fund separate from the waste water/sewer utility fund? *(Recommended)*
☑	☐	☐	☐	☐	6. Do water system revenues exceed expenditures? *(Recommended)*
☑	☐	☐	☐	☐	7. Are controls established to prevent expenditures from exceeding revenues?
☐	☑	☐	☐	☐	8. Has an independent financial audit been completed? *(Recommended)*
☐	☐	☑	☐	☐	9. If yes, is a copy of the most recent balance sheet for the water system available? *(Recommended)*
☑	☐	☐	☐	☐	10. Does the water system include a cash budget within its annual budget for cash flow? *(Recommended)*
☑	☐	☐	☐	☐	11. Does the water system management review the user fee, user charge, or rate system at least annually? *(Recommended)*
					12. When was the last user fee, user charge, or rate system adjustment? ____ *mm/dd/yyyy*
☐	☑	☐	☐	☐	13. Does the water system management review financial reports at least monthly? *(Recommended)* *Quarterly*
☑	☐	☐	☐	☐	14. Does the PWS provide and use a capital budget? *(Recommended)*
☑	☐	☐	☐	☐	15. Has this PWS produced and does it currently utilize a capital improvements plan? *(Recommended)*
					16. If yes, when was the capital improvements budget produced? ____ *mm/dd/yyyy*
☐	☐	☐	☑	☐	17. Has the capital improvement budget been updated in the last 18 months? *(Recommended)*
☐	☐	☐	☑	☐	18. Does the water system budget provide funding for depreciation of existing plant in service and/or for the funding of reserves for system replacement?
☐	☐	☐	☑	☐	19. Are there sufficient funds for training personnel?

COMMENTS:
(Please indicate the question number)

MANAGERIAL CAPACITY

SURVEY DATE		PWS #
05/07/2010	*(mm/dd/yyyy)*	7100020

yes	no	n/a	unk	note	MANAGERIAL CAPACITY
☑	☐	☐	☐	☐	1. Is a properly licensed operator available at all times? (N/A for GW-NC PWS)
☐	☑	☐	☐	☐	2. Is there a Drinking Water Source Protection Plan developed for this system? Date:
☑	☐	☐	☐	☐	3. Does this PWS have a governing body or board of directors?

If no, please indicate:

- ☐ Sole Proprietorship
- ☐ Partnership
- ☐ Limited Liability Corp.
- ☑ Other: **HOA**

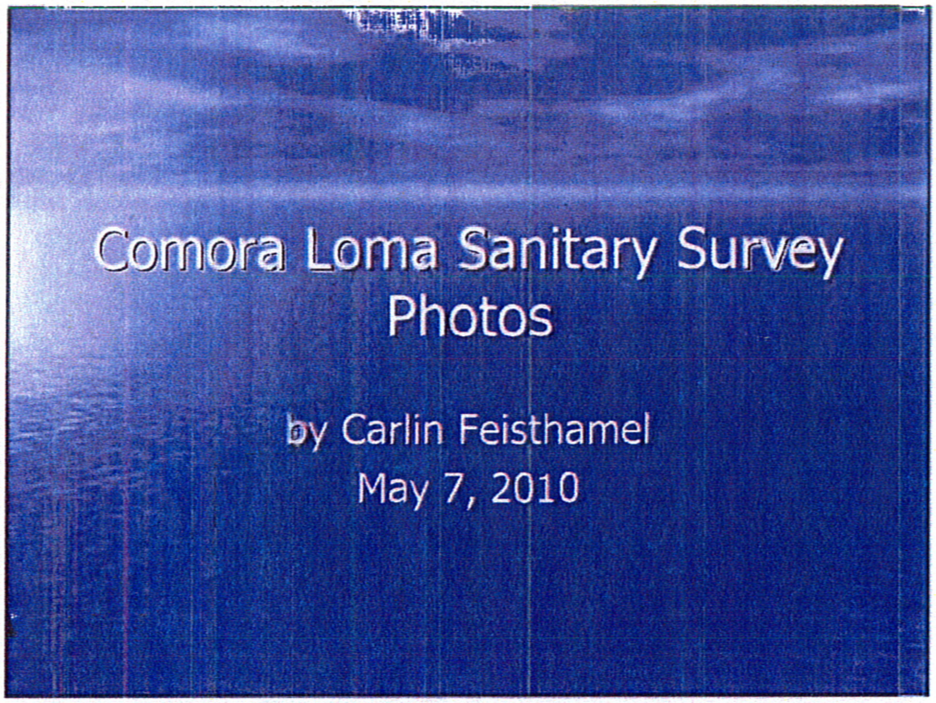
4. How often does the board meet? ☐ N/A

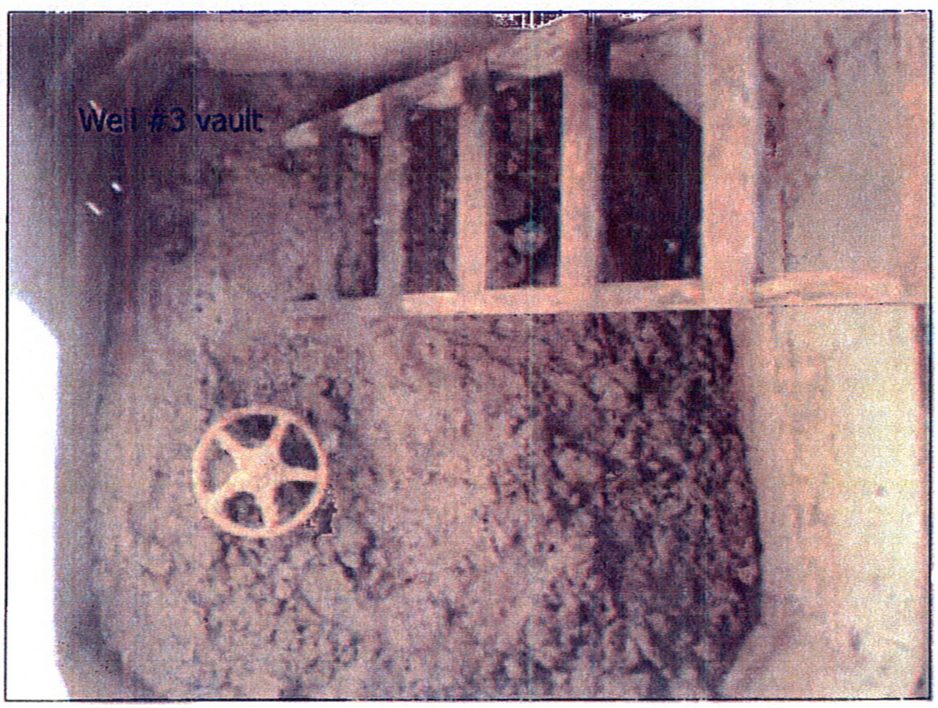
☐ weekly	☐ semi-annually	☐ never
☐ monthly	☐ annually	☐ unknown
☐ bimonthly	☐ as necessary	☑ other: **Quarterly**

yes	no	n/a	unk	note	Are the following records maintained onsite or located near by?
☑	☐	☐	☐	☐	5. - Bacteriological Analysis - **5 years retention.**
☑	☐	☐	☐	☐	6. - Chemical Analysis - **10 years retention.**
☑	☐	☐	☐	☐	7. - Records of actions taken to correct violations - **3 years retention.**
☑	☐	☐	☐	☐	8. - Copies of reports, summaries or communication related to sanitary surveys - **10 years retention.**
☑	☐	☐	☐	☐	9. - Reports concerning variances or exemptions - **5 years retention.**
☑	☐	☐	☐	☐	10. - Copies of public notices issued - **3 years retention.**
☐	☐	☑	☐	☐	11. - Daily free chlorine residuals *(required disinfection)* - **1 year retention.**
☑	☐	☐	☐	☐	12. Are routine maintenance schedules established? *(Recommended)*
☐	☐	☐	☑	☐	13. Is an operation and maintenance manual(s) provided for the PWS and does it include; daily operating instructions, operator safety procedures, location of valves and other key system features, parts list and parts order form, and information for contacting the water system operator?
☑	☐	☐	☐	☐	14. Is there a clear plan of organization and control among the people responsible for management and operations of the water system? *(Recommended)*

yes	no	n/a	unk	note	Are any samples of the following parameters past due?
☐	☑	☐	☐	☐	15. Coliform
☐	☑	☐	☐	☐	16 Nitrates
☐	☑	☐	☐	☐	17. Nitrites
☐	☑	☐	☐	☐	18 Lead and Copper
☐	☑	☐	☐	☐	19. IOCs
☐	☑	☐	☐	☐	20. VOCs
☐	☑	☐	☐	☐	21. SOCs
☐	☑	☐	☐	☐	22. Disinfection Byproducts
☐	☑	☐	☐	☐	23 Radionuclide
☐	☑	☐	☐	☐	24. Is a written total coliform rule (TCR) sample site plan available for review?
☐	☐	☑	☐	☐	25. Does the (TCR) sample site plan meet the minimum requirements?
☑	☐	☐	☐	☐	26. Does the system have a sufficient supply of approved sampling bottles properly stored? *(Recommended)*
☑	☐	☐	☐	☐	27. Does the PWS provide stairways, ladders and handrails where needed?
☑	☐	☐	☐	☐	28. Are treads of non-slip material provided where needed?
☐	☑	☐	☐	☐	29. Is a health concern produced from inadequately protected electrical wiring?
☐	☐	☑	☐	☐	30. Are all confined space entry requirements considered? *(Recommended)*
☐	☑	☐	☐	☐	31. Are there any unused subsurface water storage tanks that need to be abandoned?
☐	☑	☐	☐	☐	32. Are there any water supply wells that are no longer being used that need to be abandoned?

COMMENTS:
(Please indicate the question number)


Comora Loma Sanitary Survey
Photos
by Carlin Feisthamel
May 7, 2010

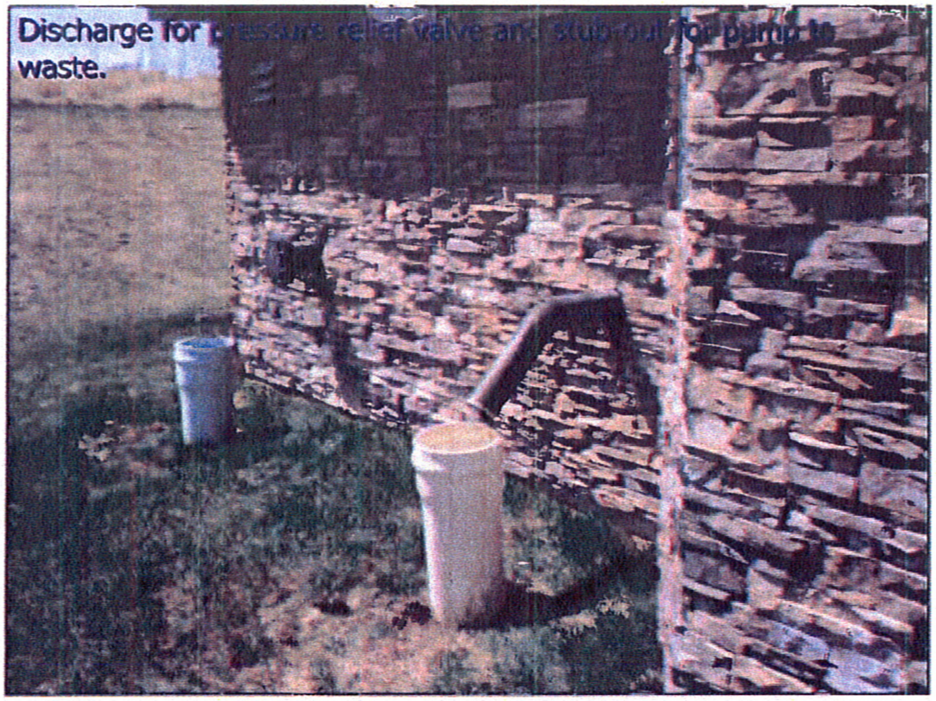

Well #3 vault


Well #3


Well #2 valves

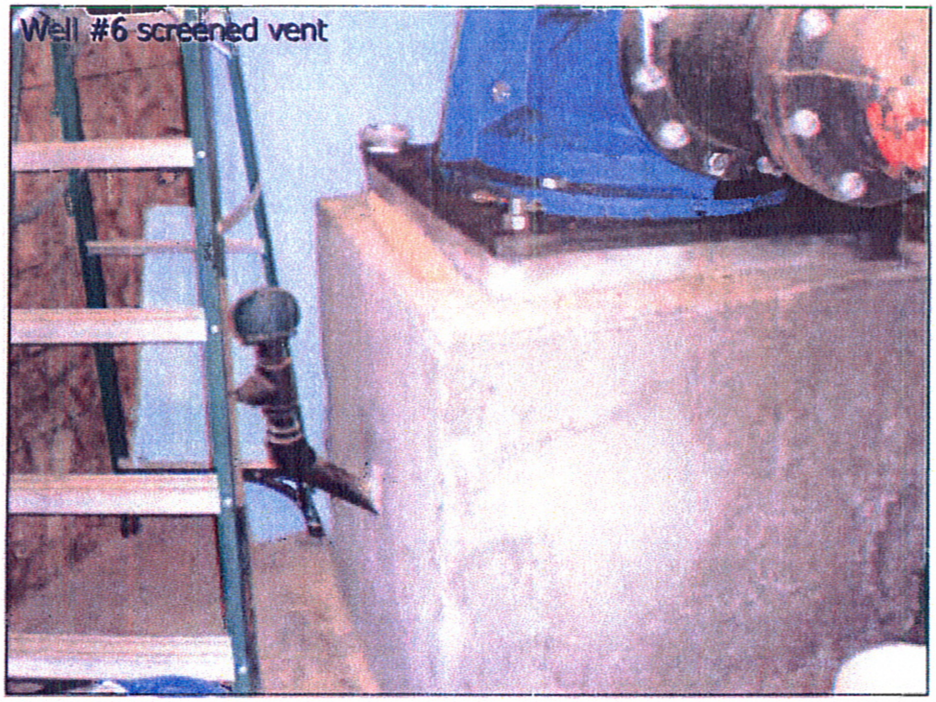

Well #2 valves

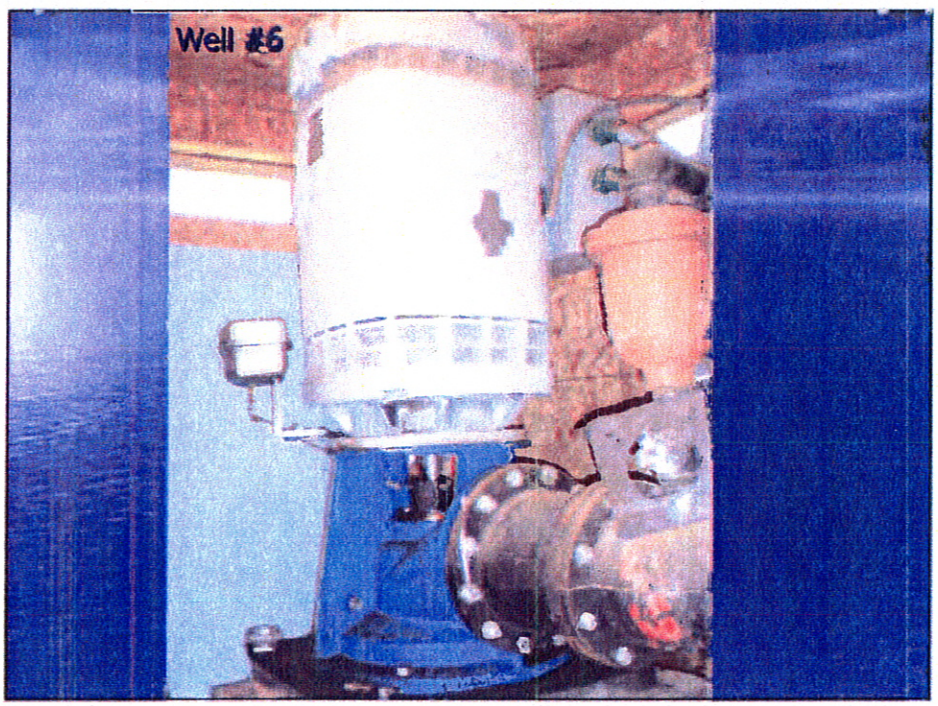

Well #2

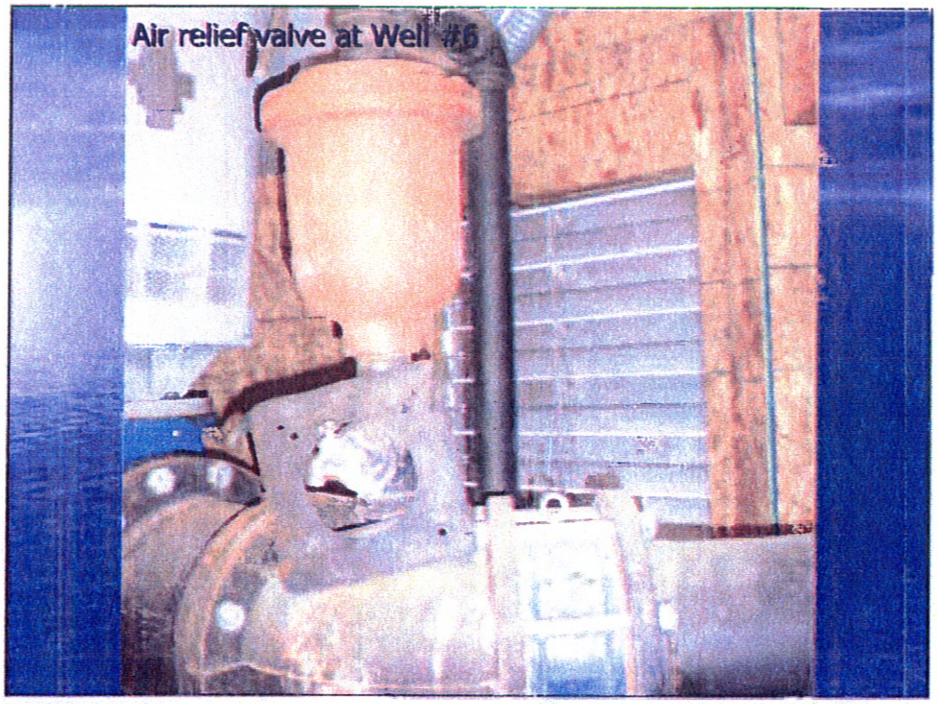


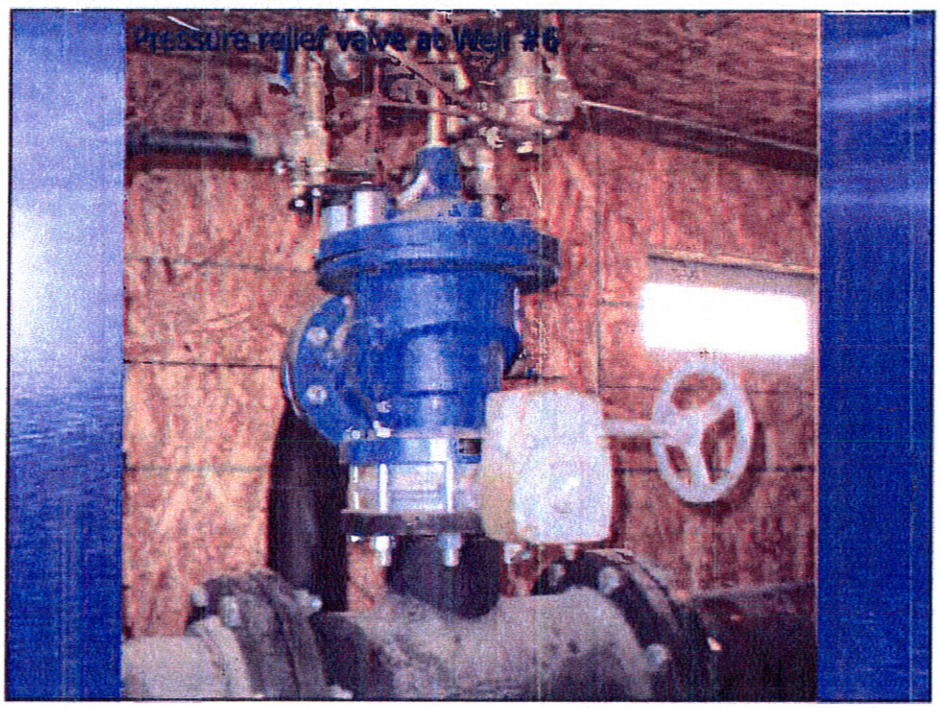
Discharge for pressure relief valve and stub out for pump to waste.

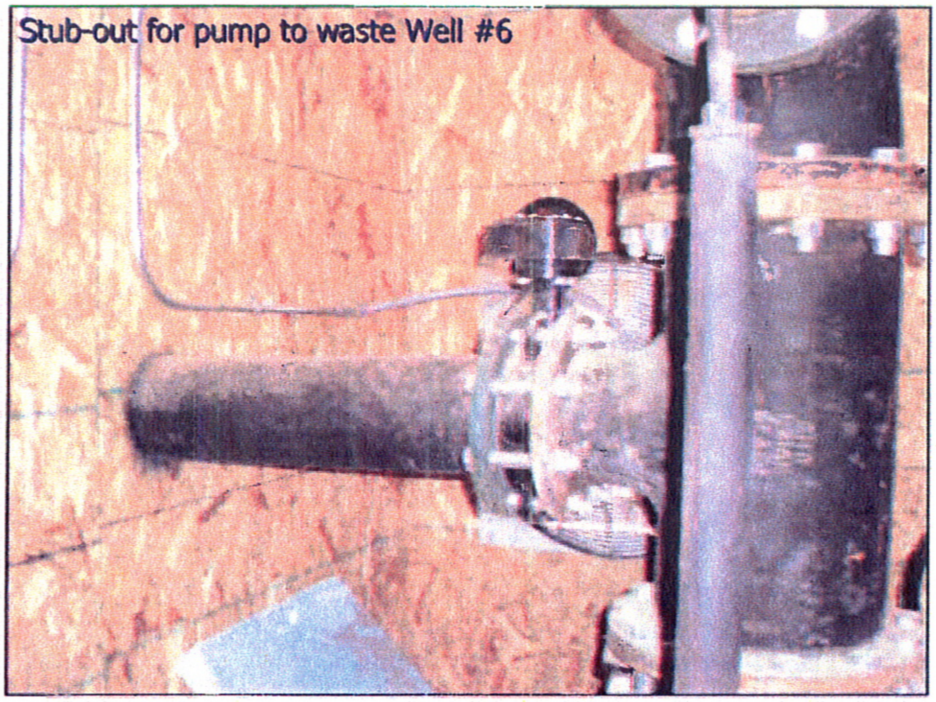
Food grade lubricant for vertical turbine motor at Well #6

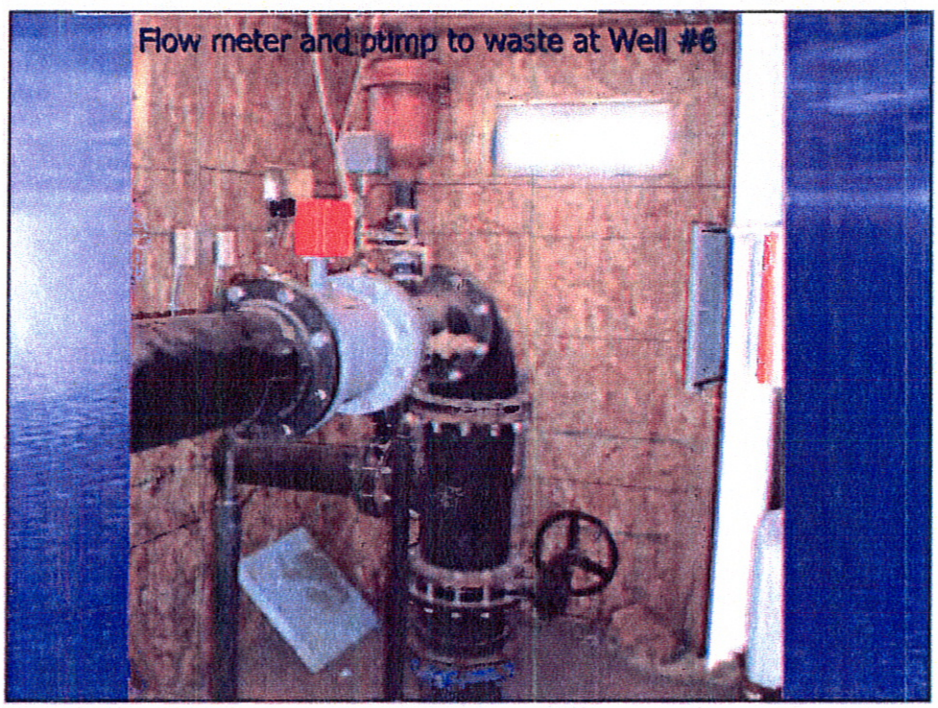

Well #6 screened vent

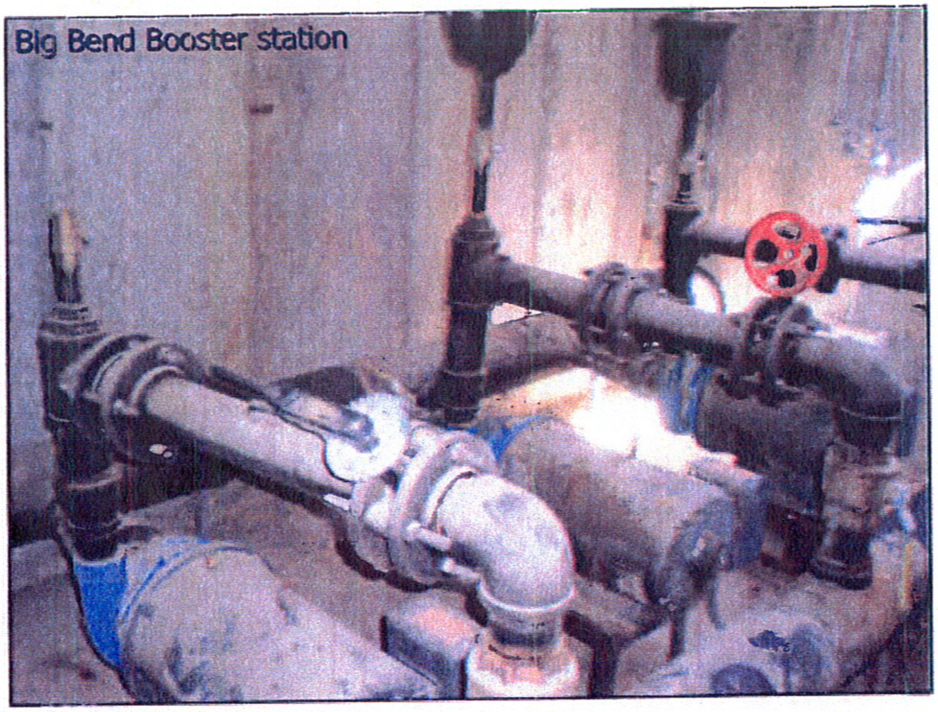

Well #6


Air relief valve at Well #6

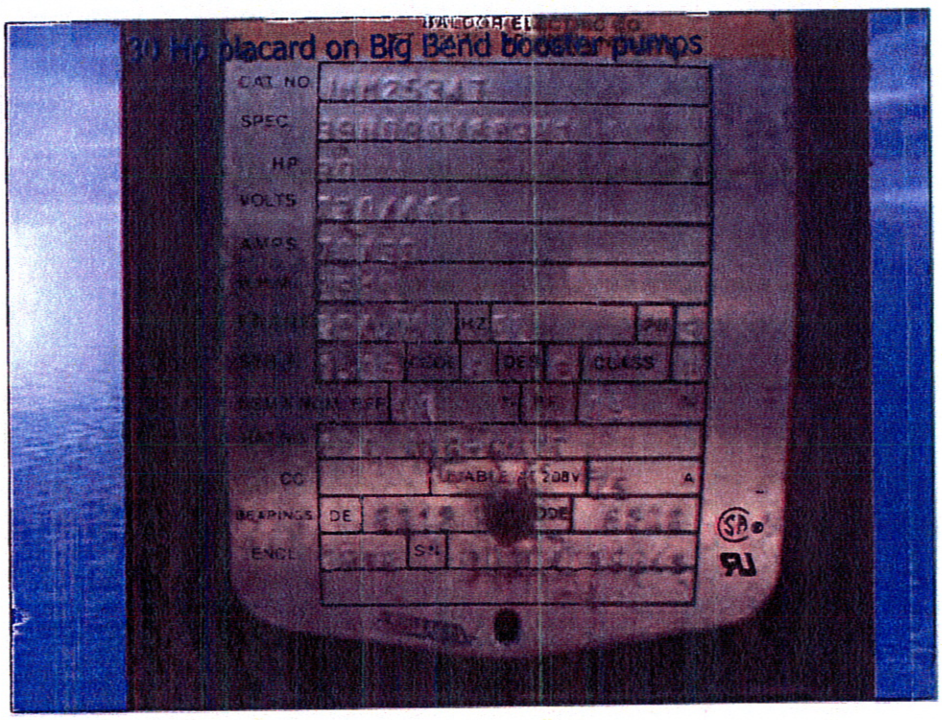

Pressure relief valve at Well #6


Stub-out for pump to waste Well #6

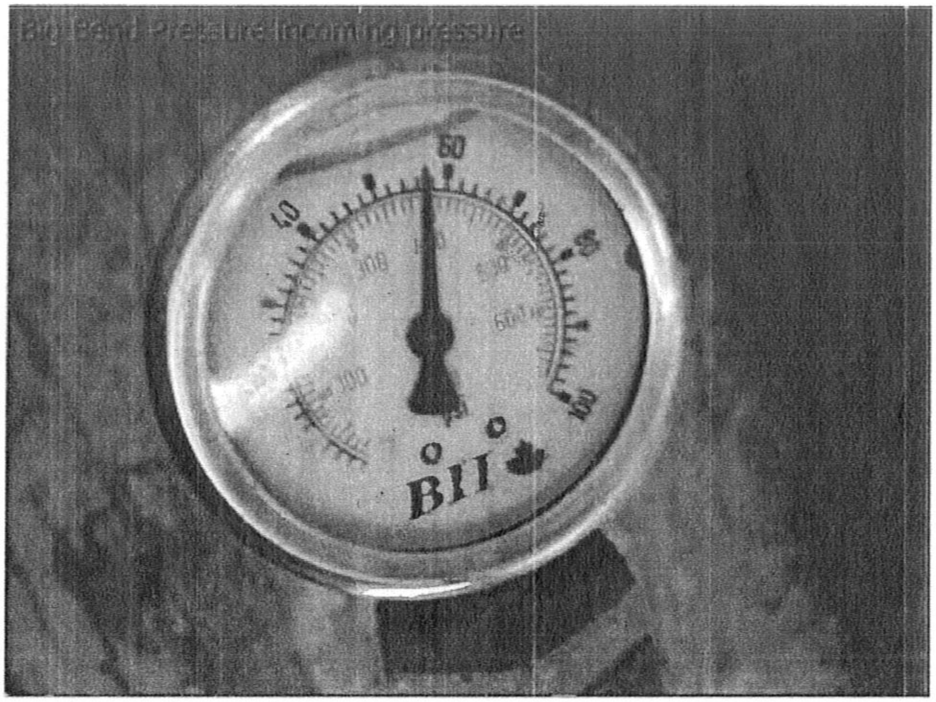

Flow meter and pump to waste at Well #6



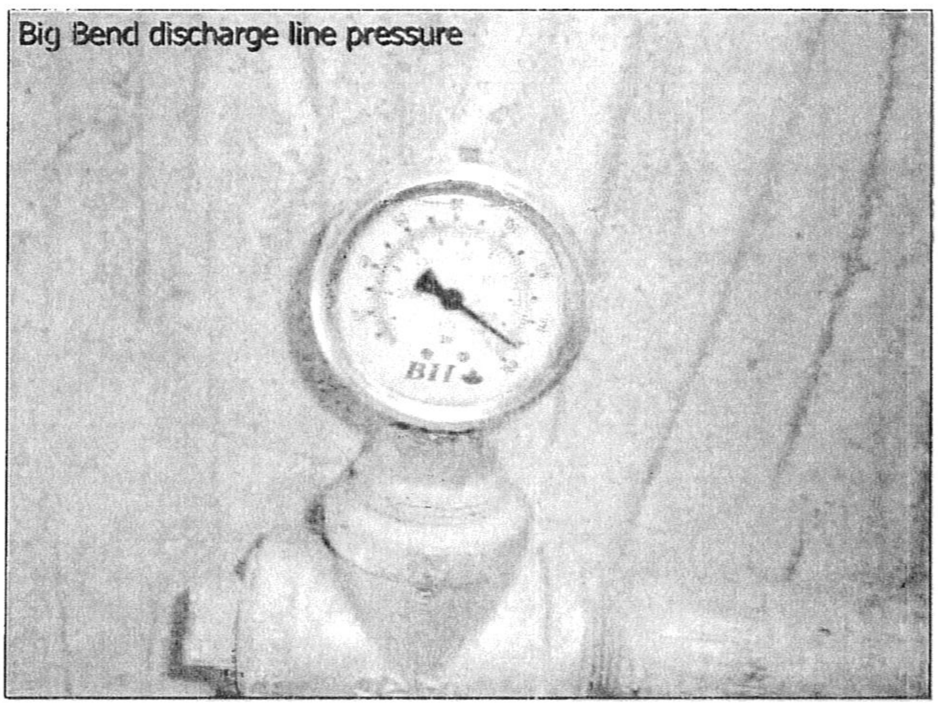
Big Bend Booster station



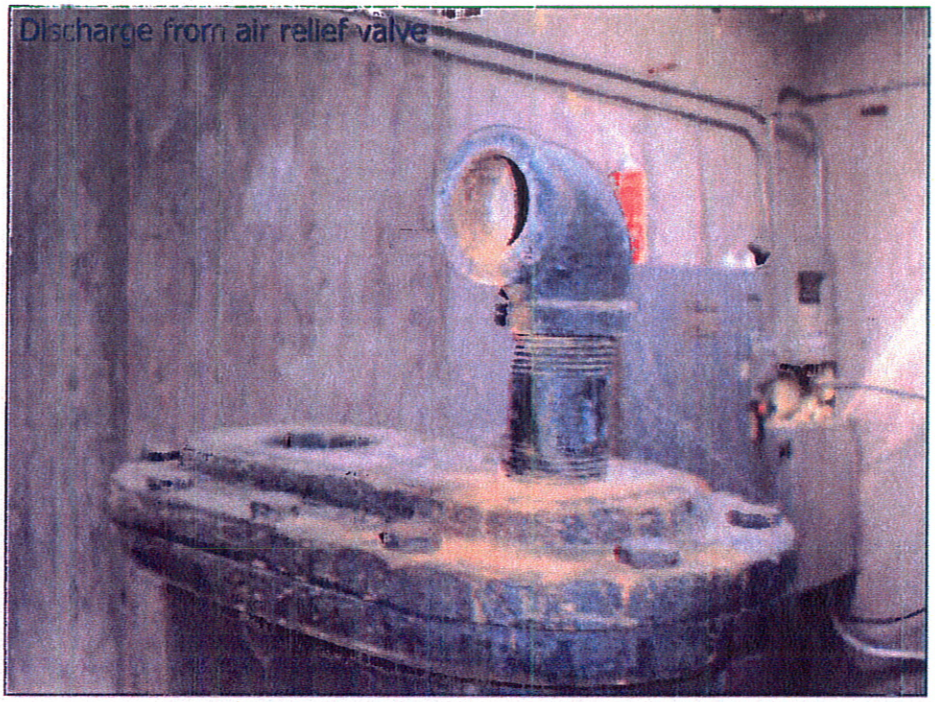
30 Hp placard on Big Bend booster pumps

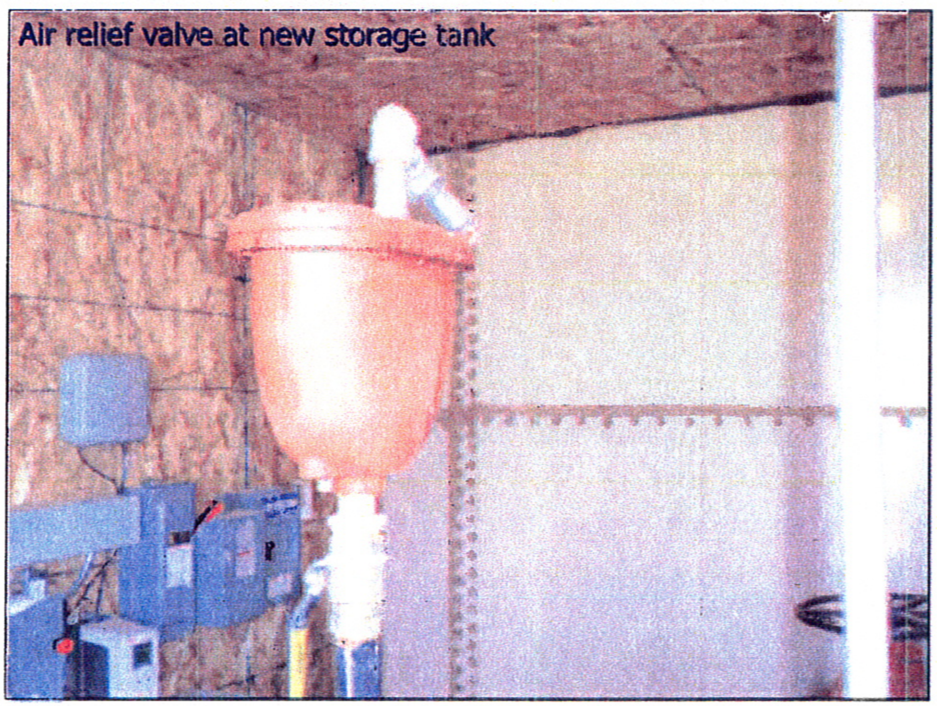


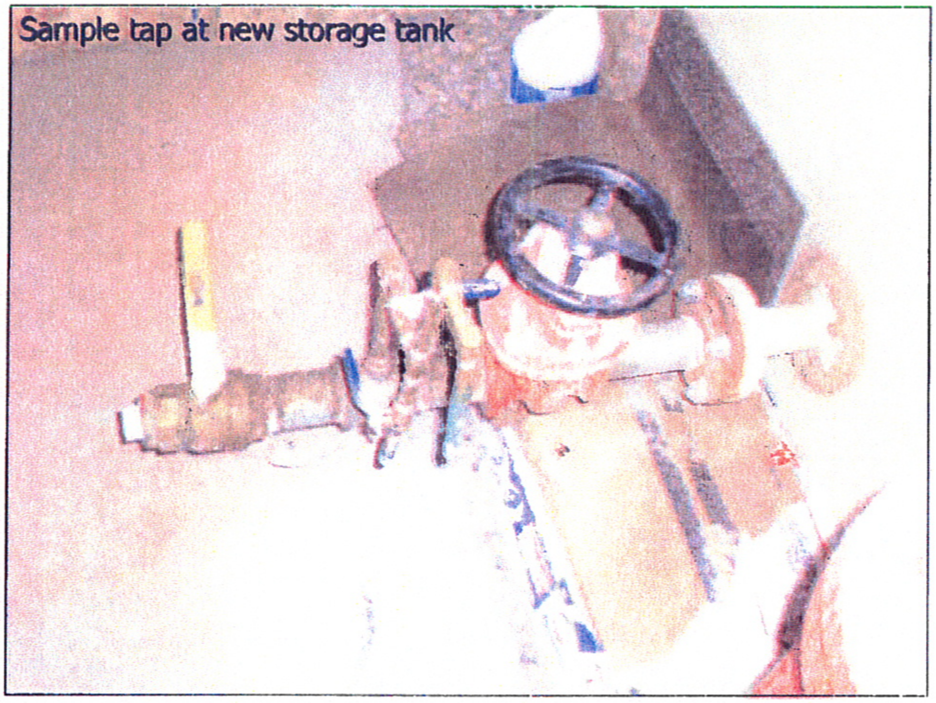
Big Bend Pressure incoming pressure

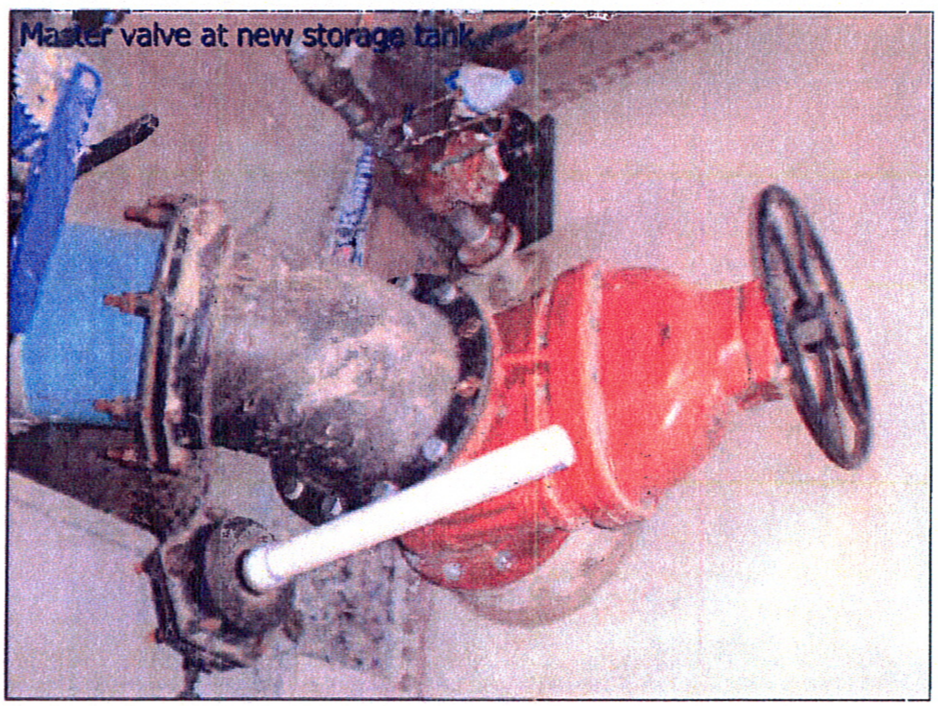


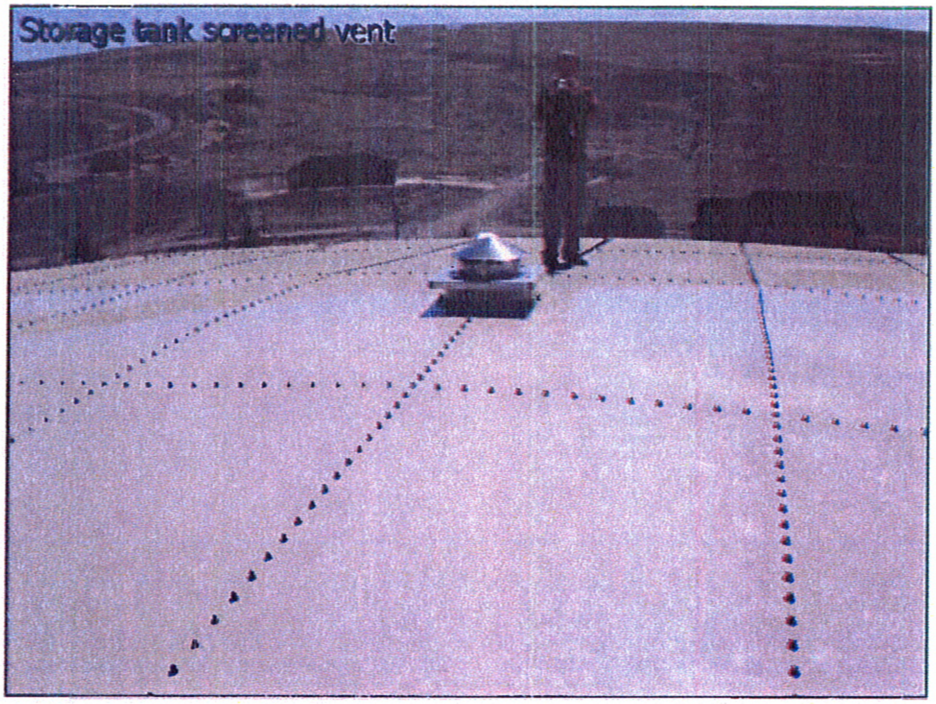
Big Bend discharge line pressure

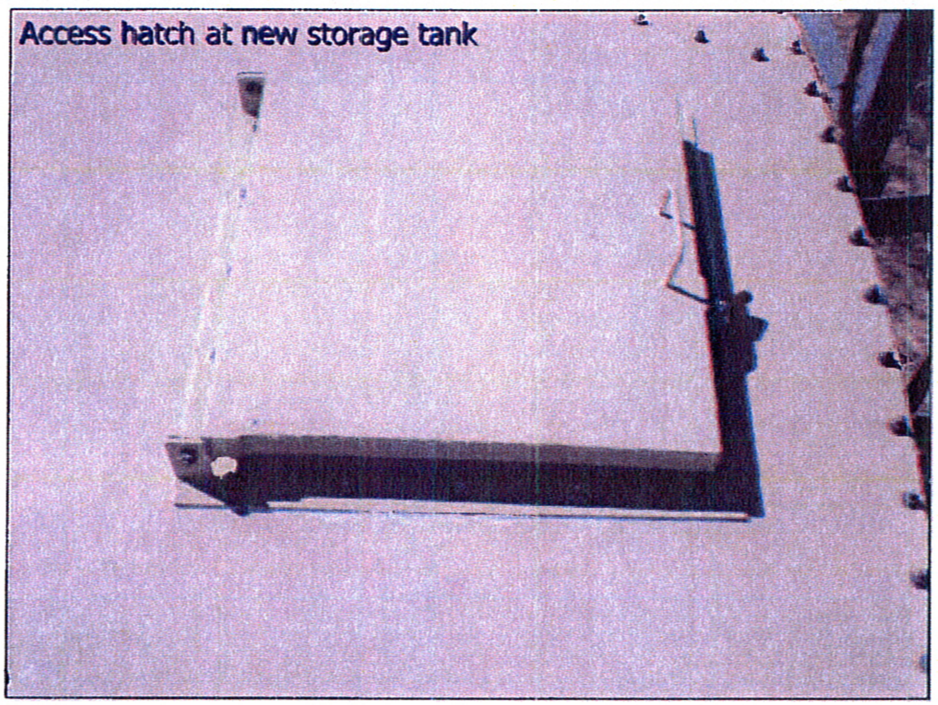

Discharge from air relief valve

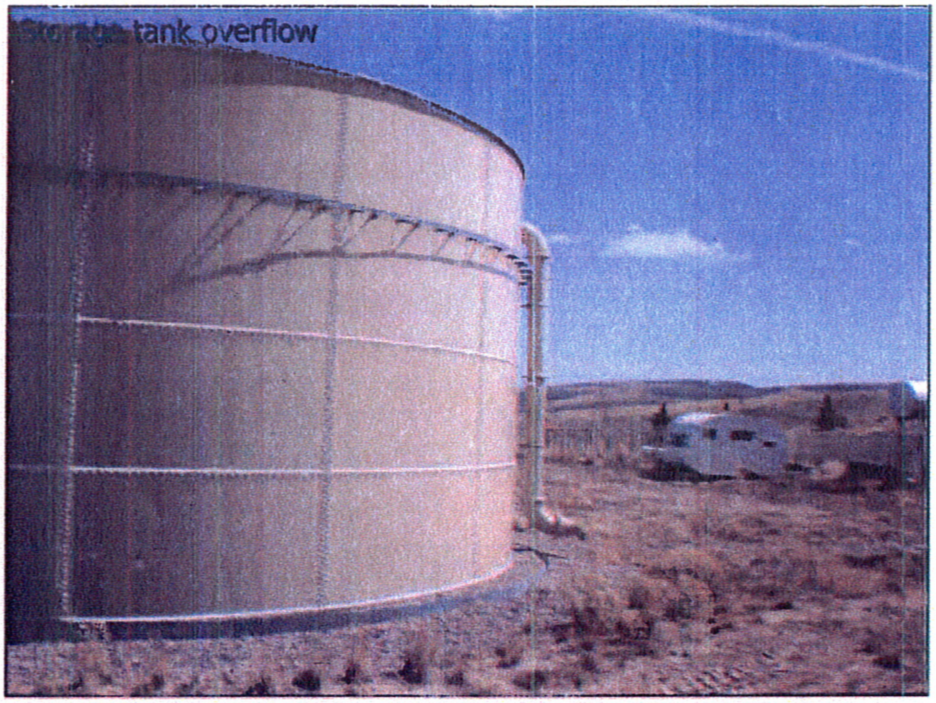

Air relief valve at new storage tank


Sample tap at new storage tank

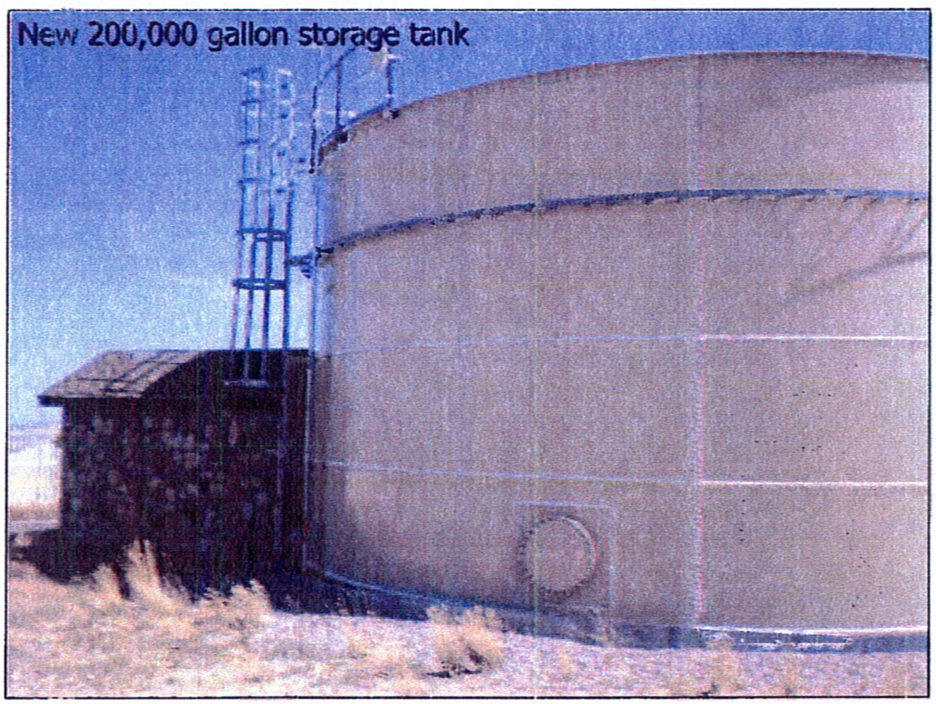

Master valve at new storage tank


Storage tank screened vent

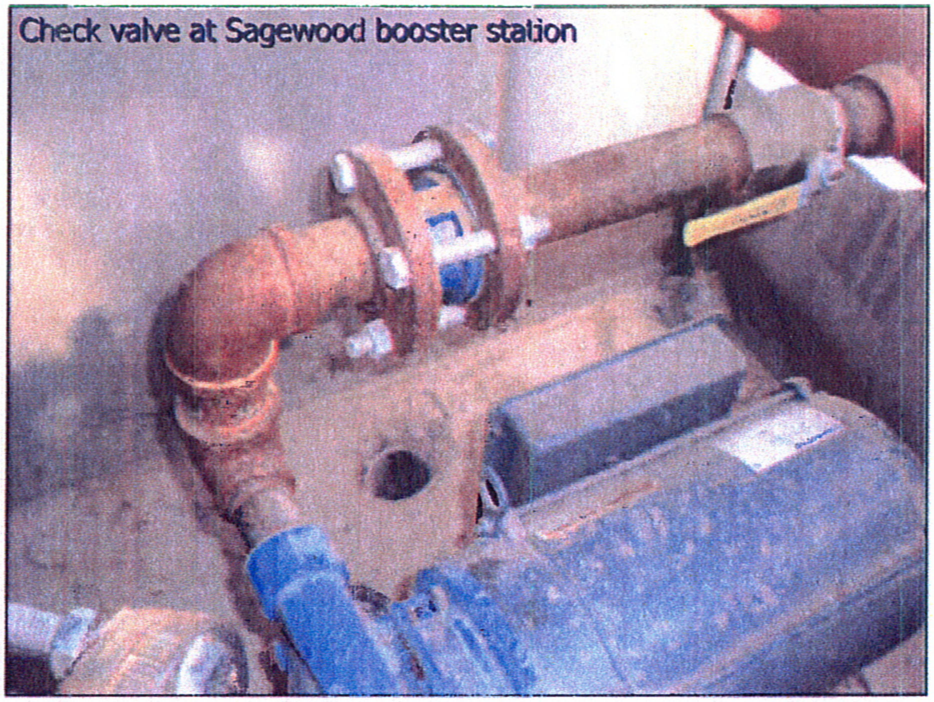

Access hatch at new storage tank



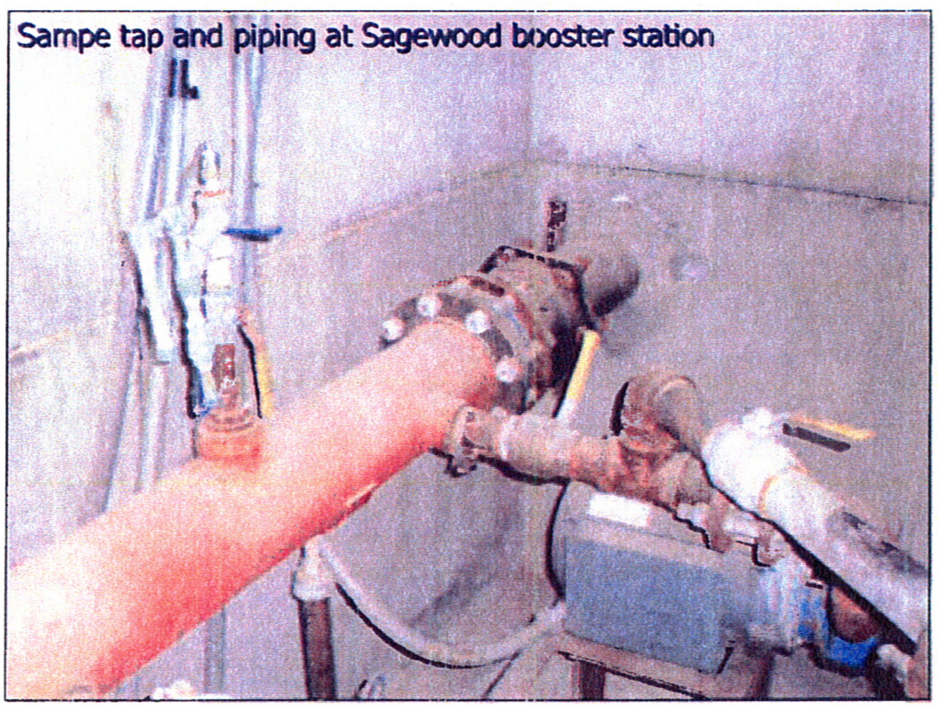
Storage tank overflow



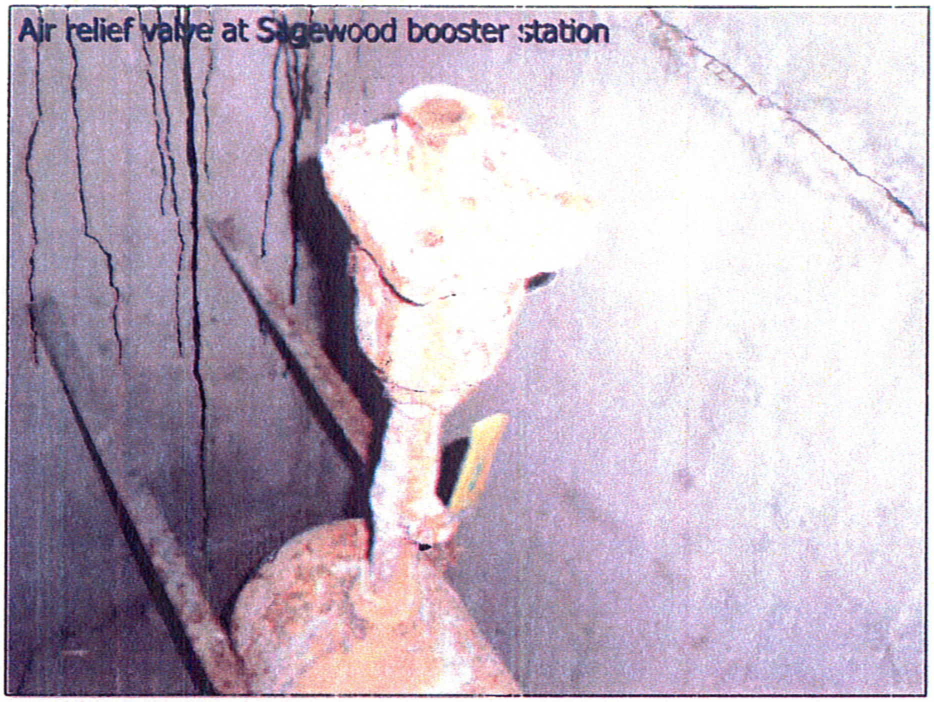
New 200,000 gallon storage tank



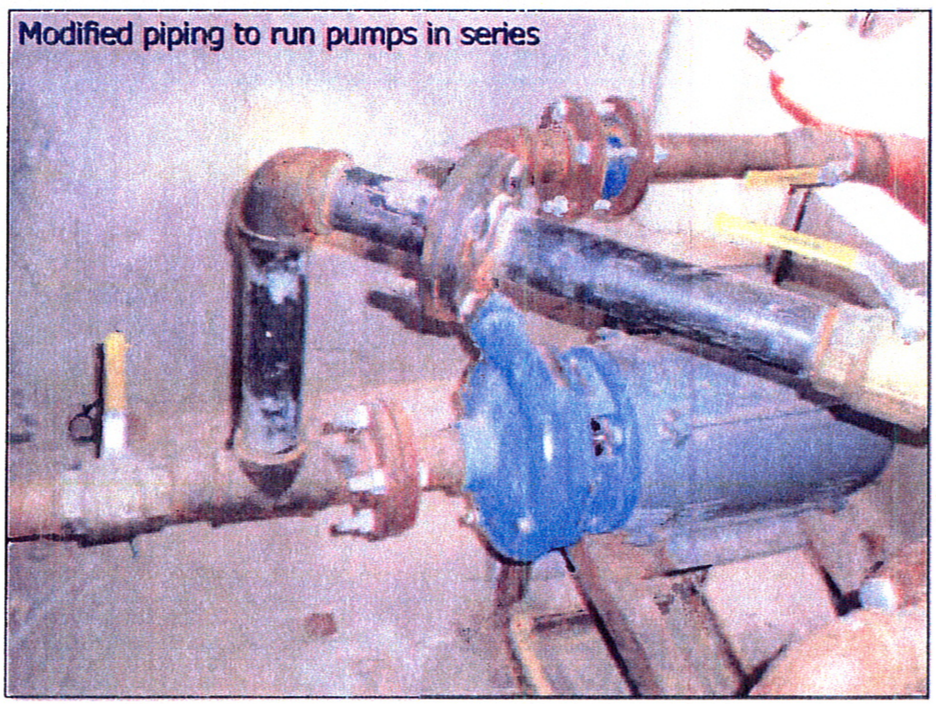
Check valve at Sagewood booster station



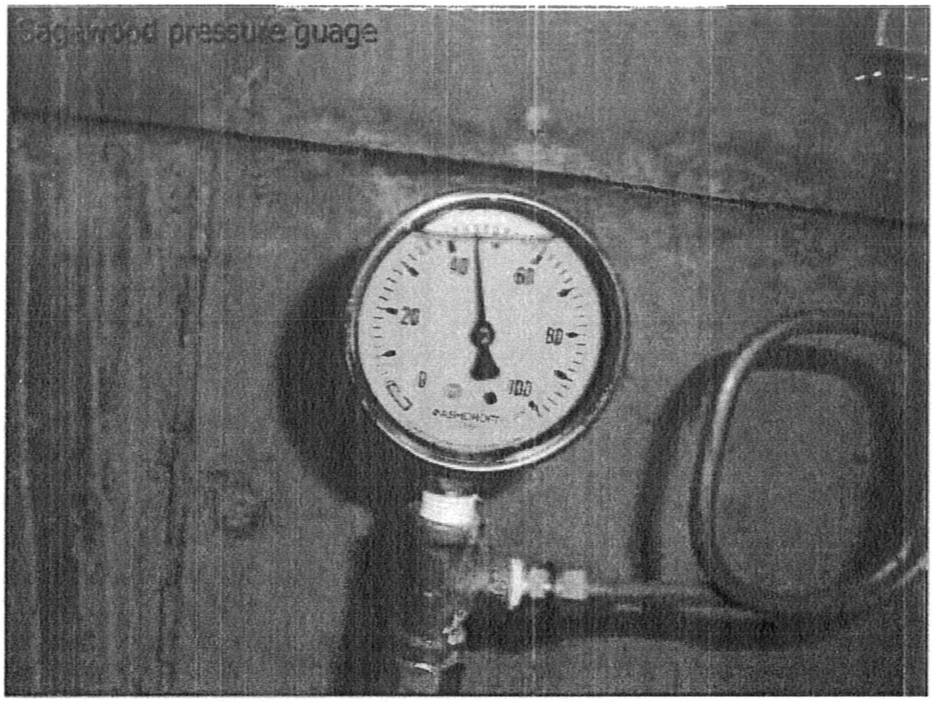
Sampe tap and piping at Sagewood booster station



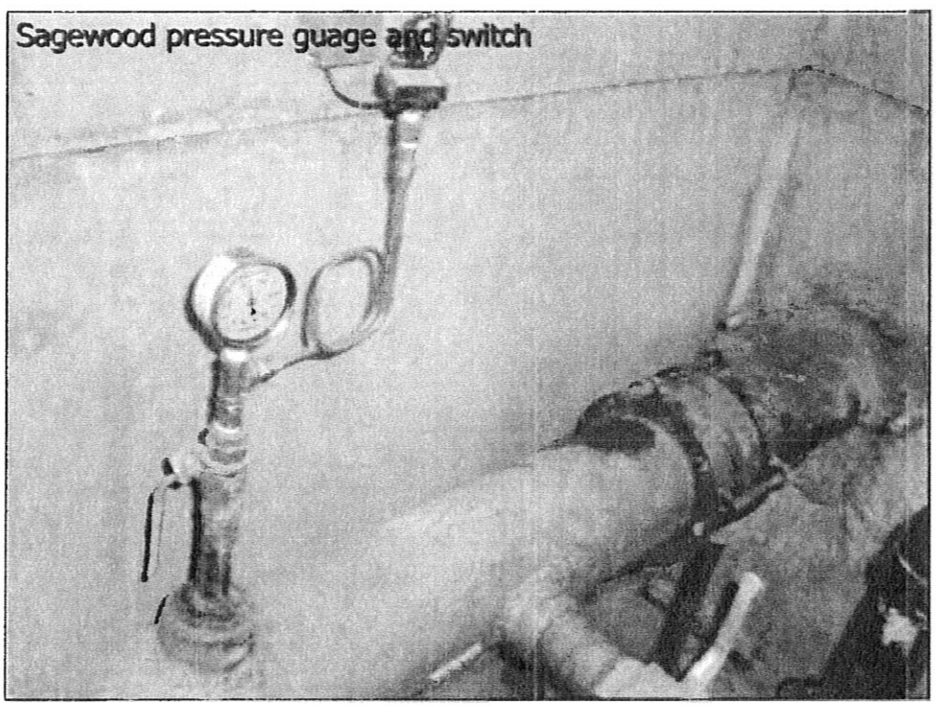
Air relief valve at Sagewood booster station



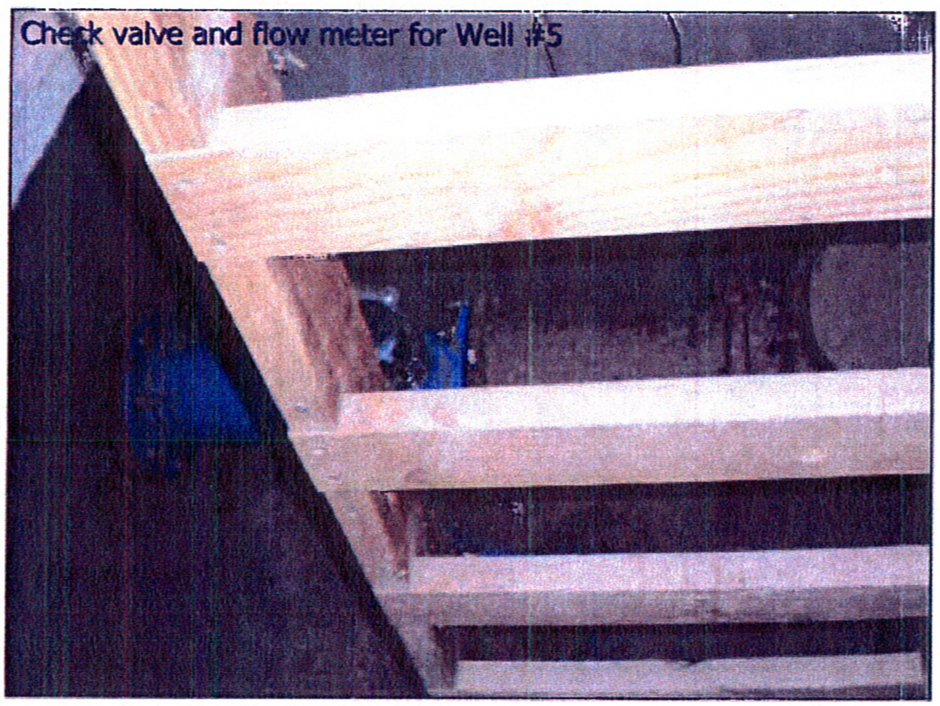
Modified piping to run pumps in series



Sagewood pressure guage

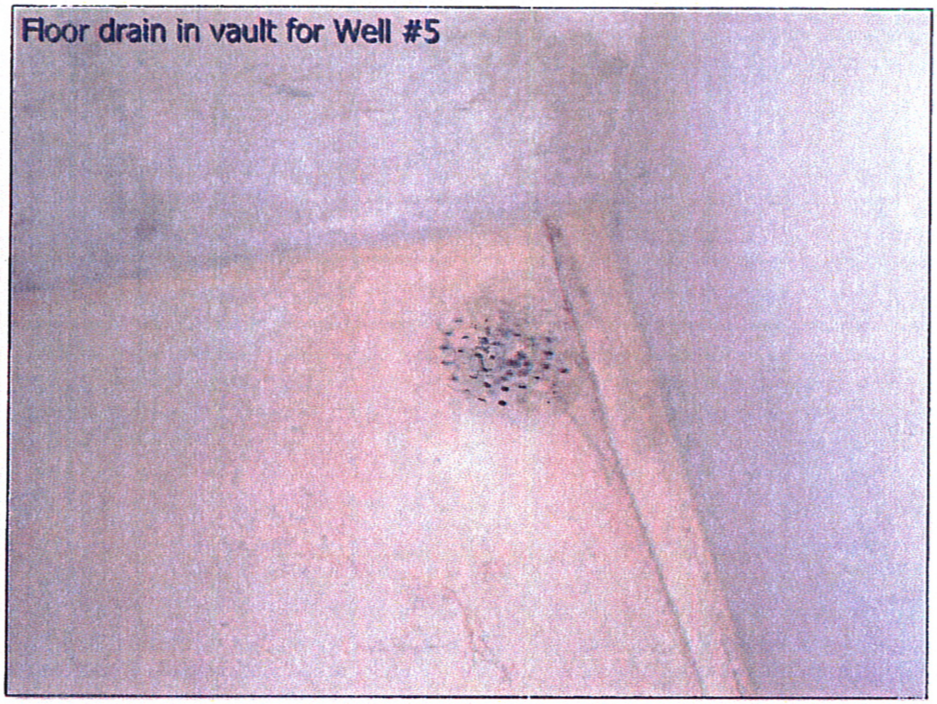


Sagewood pressure guage and switch

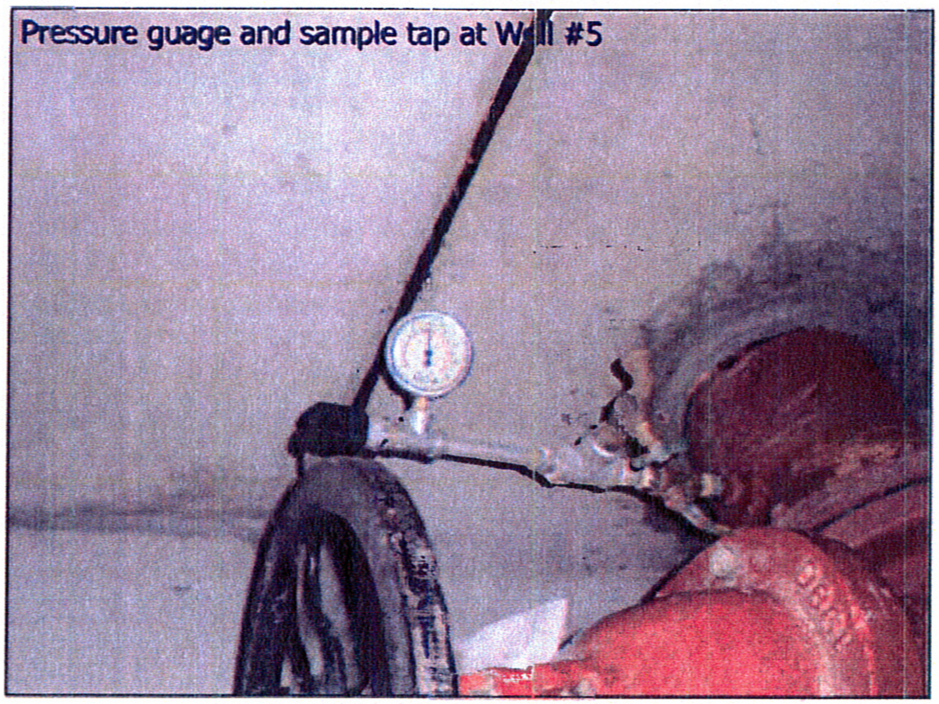


Check valve and flow meter for Well #5

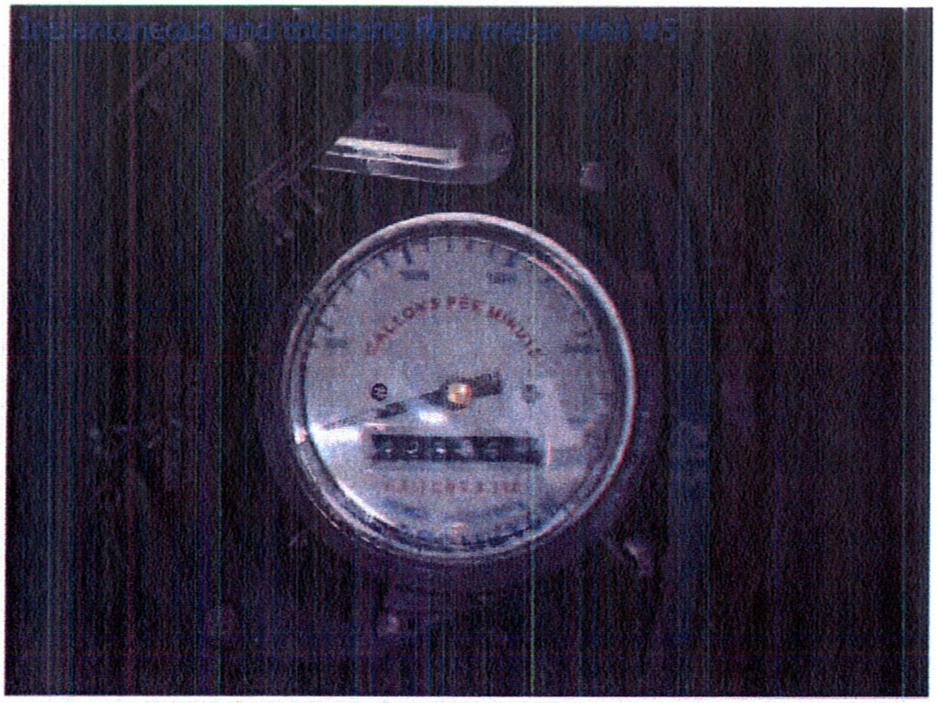

Well #5 well tag



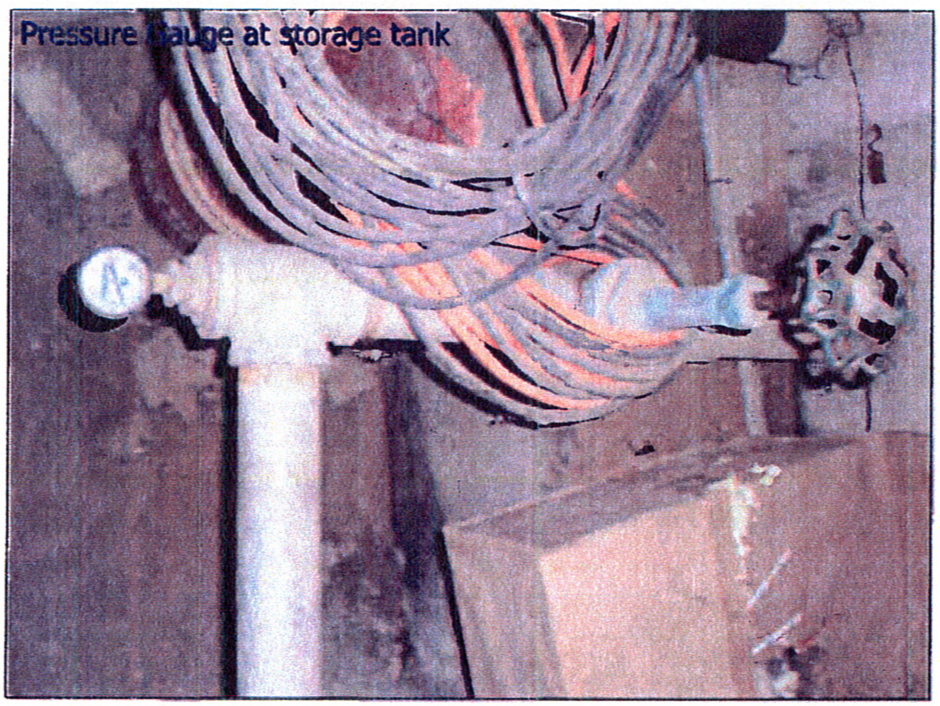
Floor drain in vault for Well #5



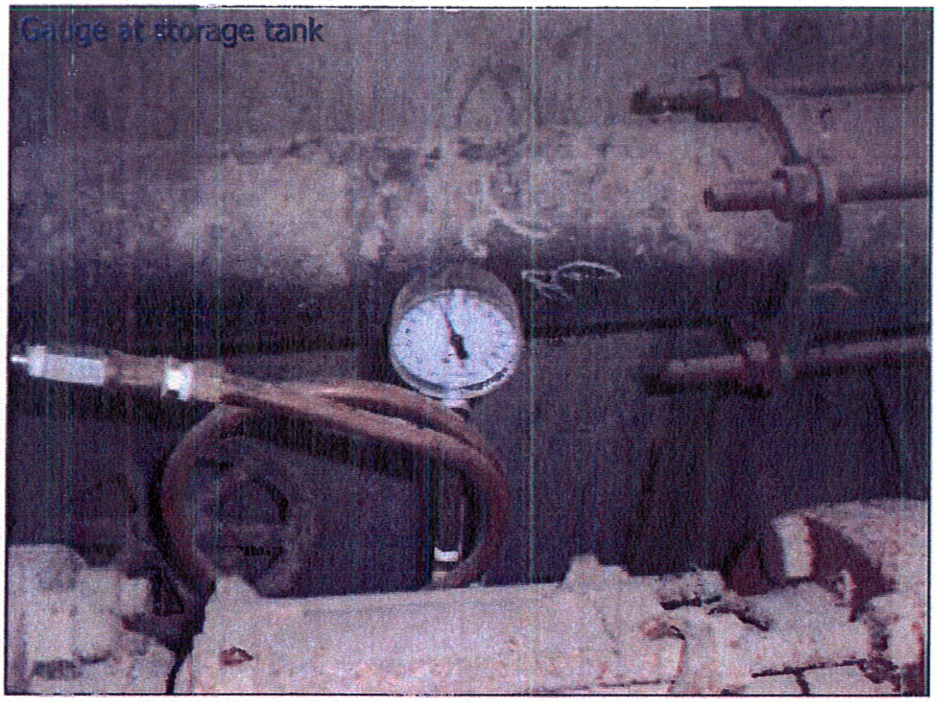
Pressure guage and sample tap at Well #5



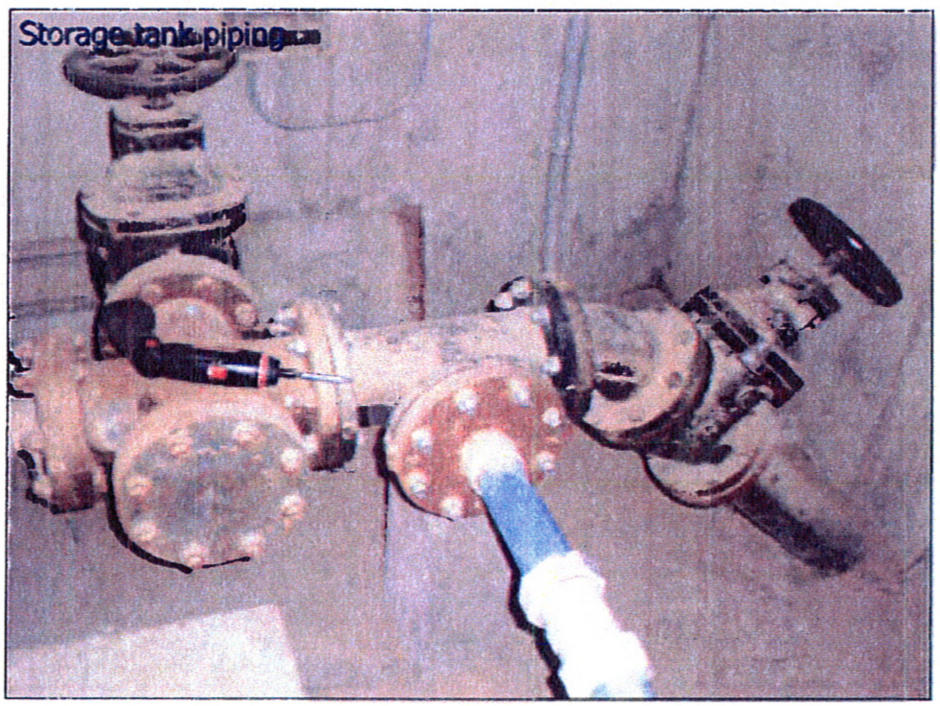
Instantaneous and totalizing flow meter Well #5



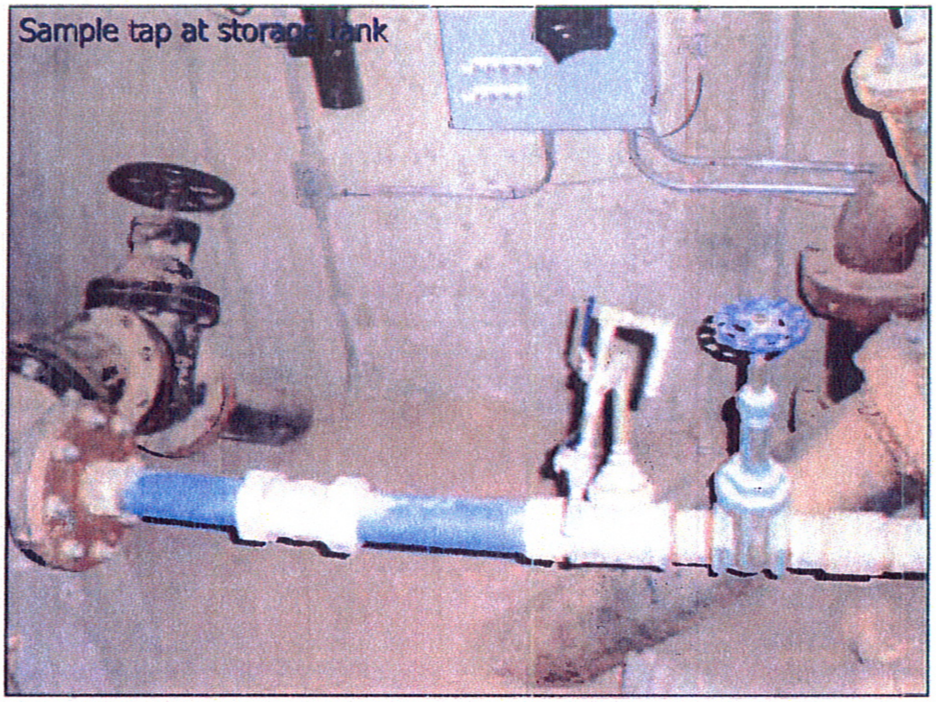
Pressure Gauge at storage tank

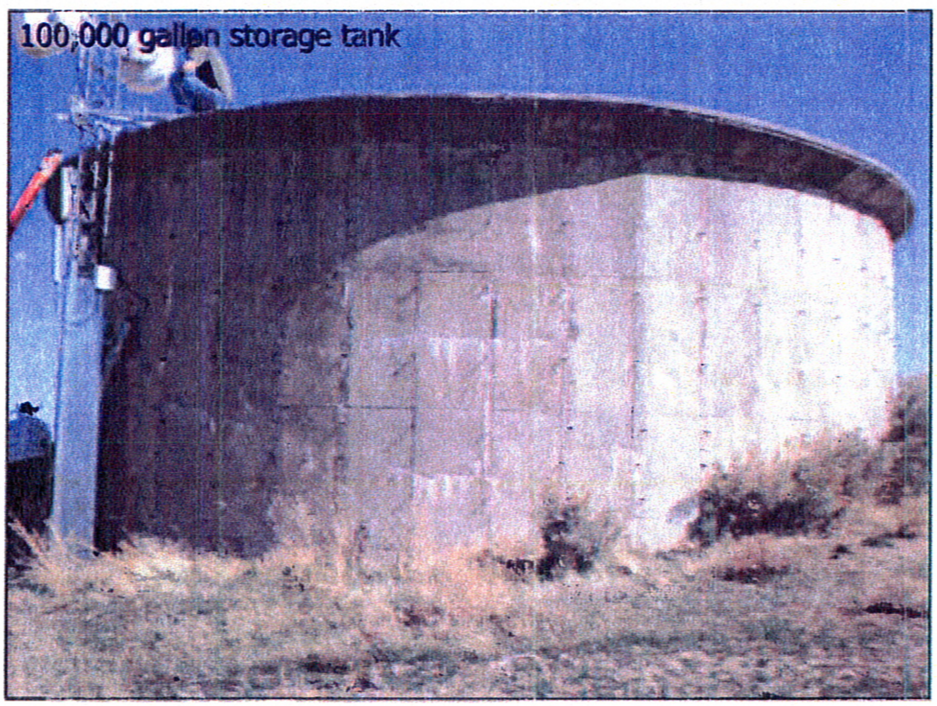


Gauge at storage tank

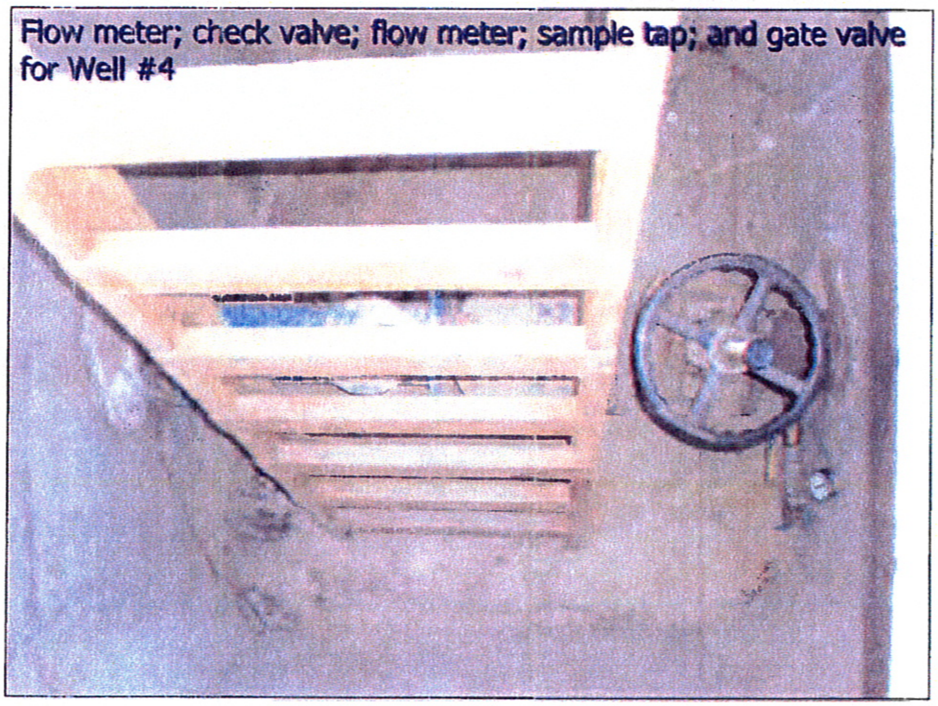


Storage tank piping

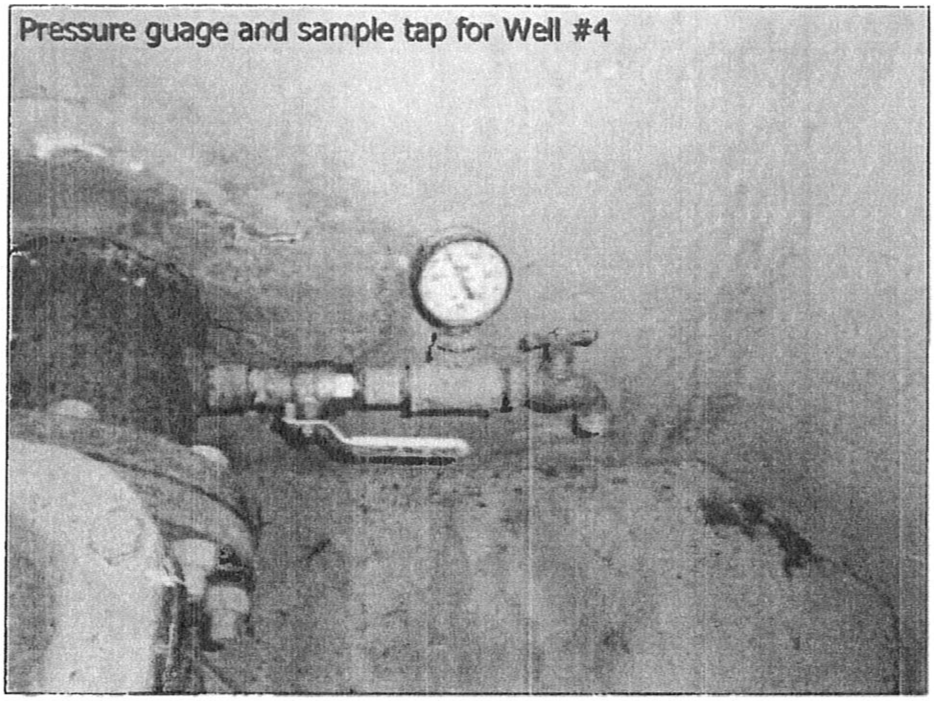

Sample tap at storage tank


100,000 gallon storage tank

Storage tank overflow



Flow meter; check valve; flow meter; sample tap; and gate valve for Well #4



Pressure guage and sample tap for Well #4

Drinking Water Cross-Connection Control Programs

Idaho Department of Environmental Quality

1410 N. Hilton
Boise, ID 83706
(208) 373-0502
www.deq.idaho.gov

Complete Requirements

The Idaho Rules for Public Drinking Water Systems contain the full text and complete requirements for cross-connection control programs.

Backflow Assembly Tester Licensing

Individuals must be licensed by the Idaho Bureau of Occupational Licenses as backflow assembly testers in order to inspect and test backflow prevention assemblies.

For More Information

Mike Stambulis
(208) 373-0123
michael.stambulis@deq.idaho.gov

What is a Cross-Connection?

An actual or potential connection or piping arrangement between a drinking water system and another source that could introduce anything other than the water intended to normally supply the system.

Cross-connections include bypass arrangements, jumper connections, removable sections, swivel or changeover devices, and other devices that may cause backflow. Backflow occurs when the normal flow direction of the water system is reversed due to back pressure or back siphonage.

Responsibilities of Water Purveyors

Water purveyors must take reasonable and prudent measures to protect their water systems against contamination and pollution from cross-connections. Methods include:

- fixture protection,
- premise isolation,
- internal (or in-plant) isolation, or
- some combination of the three above methods.

Community Water Systems

Community water system purveyors must implement and enforce a cross-connection control program to prevent toxic or hazardous materials from entering the system. Programs must include at least the following:

- All facilities are inspected to locate cross-connections and determine required suitable protection.
- Suitable protection is installed before providing water service for new connections.
- Adequate backflow prevention assemblies are installated and operating, and inspected and tested annually by a tester licensed by the Idaho Bureau of Occupational Licenses.
- Service is stopped for any facility where suitable backflow protection has not been provided for a cross-connection.

Non-Community Water Systems

Non-community water system purveyors must make sure that cross-connections either do not exist or are isolated from the water system by an appropriate backflow preventer.

Backflow Prevention Assemblies and Devices

A *backflow prevention assembly* is a set of mechanical components that prevents the undesired backflow of water or other liquids into a drinking water system and can be tested and repaired in-line. A *backflow prevention device* is a backflow preventer that does not meet the approval requirements of a backflow prevention assembly.

Some types of backflow prevention *assemblies* include the following:

- double check valve assemblies
- reduced pressure principle backflow assemblies
- spill resistant vacuum breaker assemblies
- pressure vacuum breaker assemblies

The assembly types must pass a performance test conducted by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research. In addition, all double check valve and reduced pressure principle backflow assemblies used must meet American Water Works Association (AWWA) Standards C-510 or C-511.

Some types of backflow prevention *devices* include atmospheric vacuum breakers, hose bibb vacuum breakers, and dual checks with atmospheric vent. Atmospheric vacuum breakers must be approved by either the International Association of Plumbing and Mechanical Officials (IAPMO) or the American Society of Sanitation Engineers (ASSE).

Before installing backflow preventers, water purveyors must make sure they are selected from an appropriate reference material deemed acceptable by the Idaho Department of Environmental Quality. (See the Idaho Rules for Public Drinking Water Systems, section 58.01.08.552.06.b.) The installation of any assembly must also comply with local ordinances.

DEQ publication, October 2008. Printed on recycled paper. Costs associated with this publication are available from DEQ in accordance with Section 60-202, Idaho Code.

viii. The Department may require redundant chlorine pumping capabilities with automatic switchover for systems with documented source water contamination problems and that lack adequate storage to supply the system during a pump failure. (5-8-09)

b. Systems using only ground water that add chlorine for the purpose of maintaining a disinfectant residual in the distribution system, when the source(s) is not at risk of microbial contamination, are subject to the following requirements: (4-6-05)

i. Automatic proportioning chlorinators are required where the rate of flow is not reasonably constant. (4-6-05)

ii. Analysis for free chlorine residual shall be made at a frequency that is sufficient to detect variations in chlorine demand or changes in water flow. (4-6-05)

c. Systems using only ground water that add chlorine for other purposes, such as oxidation of metals or taste and odor control, when the source(s) is known to be free of microbial contamination, must ensure that chlorine residual entering the distribution system after treatment is less than four (4.0) mg/L. The requirements in Subsection 552.04.b.ii. also apply if the system maintains a chlorine residual in the distribution system. (3-30-07)

05. Fluoridation. (12-1-92)

a. Commercial sodium fluoride, sodium silico fluoride and hydrofluosilicic acid which conform to the applicable American Water Works Association (AWWA) Standards, incorporated by reference into these rules at Subsection 002.01, are acceptable. Use of other chemicals shall be specifically approved by the Department. (3-30-07)

b. Fluoride compounds shall be stored in covered or unopened shipping containers. (3-30-07)

c. Provisions shall be made to minimize the quantity of fluoride dust. Empty bags, drums, or barrels shall be disposed of in a manner that will minimize exposure to flouride dusts. (3-30-07)

d. Daily records of flow and amounts of fluoride added shall be kept. An analysis for fluoride in finished water shall be made at least weekly. Records of these analyses shall be kept by the supplier of water for five (5) years. (12-10-92)

06. Cross Connection Control Program - Community Water Systems. The water purveyor is responsible through its cross connection control program to take reasonable and prudent measures to protect the water system against contamination and pollution from cross connections through premise isolation, internal or in-plant isolation, fixture protection, or some combination of premise isolation, internal isolation, and fixture protection. Pursuant to Section 543, all suppliers of water for community water systems shall implement a cross connection control program to prevent the entrance to the system of materials known to be toxic or hazardous. The water purveyor is responsible to enforce the system's cross connection control program. The program will at a minimum include: (5-8-09)

a. An inspection program to locate cross connections and determine required suitable protection. For new connections, suitable protection must be installed prior to providing water service. (5-8-09)

b. Required installation and operation of adequate backflow prevention assemblies. Appropriate and adequate backflow prevention assemblies for various facilities, fixtures, equipment, and uses of water must be selected from either the Pacific Northwest Cross Connection Control Manual, the Uniform Plumbing Code, the Environmental Protection Agency's Cross Connection Control Manual, the USC Manual of Cross Connection Control, or other sources deemed acceptable by the Department. The assemblies must comply with local ordinances. (5-8-09)

c. Annual inspections and testing of all installed backflow prevention assemblies by a tester licensed by a licensing authority recognized by the Department. Testing shall be done in accordance with the test procedures published by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research. See the USC Manual of Cross-Connection Control referenced in Subsection 002.02. (3-30-07)

d. Discontinuance of service to any facility where suitable backflow protection has not been provided for a cross connection. (3-30-07)

07. Cross Connection Control Program - Non-Community Water Systems. All suppliers of water for non-community water systems shall ensure that cross connections do not exist or are isolated from the potable water system by an approved backflow prevention assembly. Backflow prevention assemblies shall be inspected and tested annually for functionality by an Idaho licensed tester, as specified in Subsection 552.06.c. (5-8-09)

553. CLASSIFICATION OF WATER SYSTEMS.

01. System Classification Required. The Department shall classify community, nontransient noncommunity, and surface water systems based on indicators of potential health risks. (4-6-05)

a. The owner or designee of every community and nontransient noncommunity public water system shall submit proof of the current conditions related to the classification of the system every five (5) years or more frequently if required by the Department. (4-6-05)

b. The owner or designee of all surface water systems shall submit proof of the current conditions related to the classification of the system every five (5) years or more frequently if required by the Department. (4-6-05)

02. Classification Criteria. Systems shall be classified under a system that uses the following criteria: (4-6-05)

a. Complexity, size, and type of source water for treatment facilities. (3-16-04)

b. Complexity and size of distribution systems. (4-5-00)

c. Other criteria deemed necessary to completely classify systems. (4-5-00)

d. The Department shall develop guidelines for applying the criteria set forth in Section 553. (3-16-04)

554. LICENSE REQUIREMENTS.

01. Licensed Operator Required. (4-6-05)

a. Owners of all community and nontransient noncommunity public drinking water systems must place the direct supervision of their drinking water system, including each treatment facility and distribution system, under the responsible charge of a properly licensed operator. (5-8-09)

b. Owners of all surface water systems must place the direct supervision of their public drinking water system under the responsible charge of a properly licensed operator. (4-6-05)

02. Responsible Charge Operator License Requirement. An operator in responsible charge of a public drinking water system must hold a valid license equal to or greater than the classification of the public water system where the responsible charge operator is in responsible charge. (4-6-05)

03. Substitute Responsible Charge Operator License Requirement. At such times as the responsible charge operator is not available, a substitute responsible charge operator shall be designated to replace the responsible charge operator. A substitute responsible charge operator of a public water system must hold a valid license equal to or greater than the classification of the public water system where the substitute responsible charge operator is in responsible charge. (4-6-05)

Appendix F: Detailed Estimates of Probable Cost

Estimate of Probable Construction Cost to Replace Valves and Add Hydrants - Alts 8, 10, 11 & 12

Item No.	Distribution Improvements	Units	Quantity	Unit Cost	Extended Cost
1	Cut fire hydrants onto existing main lines	EA	24	$3,500	$84,000
2	Replace broken valves	EA	20	$2,000	$40,000
3	Asphalt repair	EA	25	$500	$12,500
4	Traffic control	LS	1	$5,000	$5,000
5	Mobilization (5% of bid)	LS	1	$7,000	$7,000
Subtotal construction					**$148,500**
Engineering @ 10%					**$14,900**
Total					**$163,400**

Estimate of Probable Cost to Install meters and boxes at all services - Alts 11 & 12

Item No.	Distribution Improvements	Units	Quantity	Unit Cost	Extended Cost
1	New water meters, Mueller box, lid, insulation, installation, 1"	EA	320	$1,640	$524,800
2	Hand-held device and software	LS	1	$20,000	$20,000
3	Mobilization (5% of bid)	LS	1	$27,200	$27,200
Subtotal construction					**$572,000**
Engineering @ 8%					**$45,800**
Total					**$617,800**

Estimate of Probable Construction Cost to loop Zone 3 in Division 25

Item No.	Distribution Improvements	Units	Quantity	Unit Cost	Extended Cost
1	8" PVC pipe	LF	900	$35	$31,500
2	8-inch valves	EA	2	$1,200	$2,400
3	8-inch elbows	EA	4	$1,000	$4,000
4	12-inch tee	EA	1	$1,800	$1,800
5	Asphalt Repair	LF	30	$30	$900
6	Traffic Control	LS	1	$500	$500
7	Easements	EA	2	$500	$1,000
8	Mobilization (5% of bid)	LS	1	$2,000	$2,000
Subtotal construction					**$44,100**
Engineering @ 15%					**$6,600**
Total					**$50,700**

Estimate of Probable Cost for New Tank 1 without Equalization Storage, Alt. 10 & Alt 12

Item No.	Item	Estimated Cost
1	300,000 gallon bolted steel storage tank delivered and installed on gravel pad	$228,000
2	Foundation for center post	$2,000
3	Earthwork and gravel pad	$30,000
4	Electronic level control for SCADA system	$5,000
5	Mobilization	$13,000
Subtotal construction		**$278,000**
Engineering @ 10%		**$28,000**
Total		**$306,000**

Estimate of Probable Cost for New Tank 1 with Equalization Storage - Alt. 11 & 13

Item No.	Item	Estimated Cost
1	422,000 gallon bolted steel storage tank delivered and installed on gravel pad	$292,400
2	Foundations for center posts	$5,000
3	Earthwork and gravel pad	$40,000
4	Electronic level control for SCADA system	$5,000
5	Mobilization	$17,000
Subtotal construction		**$359,400**
Engineering @ 10%		**$36,000**
Total		**$395,400**

Estimate of Probable Cost for Tank 2A for Equalization Storage - Alt. 11

Item No.	Item	Estimated Cost
1	342,000 gallon bolted steel storage tank delivered and installed on gravel pad	$258,600
2	Foundations for center posts	$5,000
3	Earthwork and gravel pad	$30,000
4	Electronic level control for SCADA system	$5,000
5	Mobilization	$15,000
Subtotal construction		**$313,600**
Engineering @ 10%		**$31,000**
Total		**$344,600**

Tank 1 BPS Estimate of Probable Cost for Alt - 8, 10

Item No.	Item	Estimated Cost
1	Land purchase	$15,000
2	(3) 75 Hp booster pumps, VFD's, filters, transducers	$184,500
3	Building piping, check valves, gate valves, pressure relief valve, air relief valve & flowmeter	$60,500
4	Building structure (approx. 30'x30')	$54,000
5	Building drain to grade	$2,000
6	Three phase power to building	$25,000
7	Building electrical	$30,000
8	Exterior 10" piping to Zone 2	$21,200
9	Piping from new storage tank to bps, 12"	$9,000
10	Pump to waste hydrant & valves	$5,000
11	SCADA link and equipment	$12,000
12	Diesel driven 150 KW standby generator and transfer switch including concrete tub and all-weather enclosure	$100,000
13	Mobilization	$26,000
Subtotal construction		**$544,200**
Engineering @ 10%		**$65,000**
Total		**$609,200**

Tank 1 BPS Estimate of Probable Cost for Alt - 11

Item No.	Item	Estimated Cost
1	Land purchase	$15,000
2	(3) 75 Hp booster pumps, VFD's, filters, transducers	$184,500
3	Building piping, check valves, gate valves, pressure relief valve, air relief valve & flowmeter	$60,500
4	Building structure (approx. 30'x30')	$54,000
5	Building drain to grade	$2,000
6	Three phase power to building	$25,000
7	Building electrical	$30,000
8	Exterior 10" piping to Zone 2	$21,200
9	Piping from new storage tank to bps, 12"	$9,000
10	Pump to waste hydrant & valves	$5,000
11	SCADA link and equipment	$12,000
12	Mobilization	$21,000
Subtotal construction		**$439,200**
Engineering @ 12%		**$53,000**
Total		**$492,200**

Tank 1 BPS Estimate of Probable Cost for Alt - 12 & 13

Item No.	Item	Estimated Cost
1	Land purchase	$15,000
2	(3) 50 Hp booster pumps, VFD's, filters, transducers	$150,000
3	Building piping, check valves, gate valves, pressure relief valve, air relief valve & flowmeter	$60,500
4	Building structure (approx. 30'x30')	$54,000
5	Building drain to grade	$2,000
6	Three phase power to building	$25,000
7	Building electrical an mechanical	$25,000
8	Exterior 10" piping to Zone 2	$21,200
9	Piping from new storage tank to bps, 12"	$9,000
10	Pump to waste hydrant & valves	$5,000
11	SCADA link and equipment	$12,000
12	Diesel driven 100 KW standby generator and transfer switch including concrete tub and all-weather enclosure	$80,000
13	Mobilization	$23,000
Subtotal construction		**$481,700**
Engineering @ 12%		**$58,000**
Total		**$539,700**

Estimate of Probable Cost for New Well #1 or Well #8 Well House & Pump for Alt-10

Item No.	Item	Estimated Cost
1	Land purchase	$15,000
2	200 Hp vertical turbine pump, column, VFD, filter, transducer	$170,500
3	Building piping, check valves, gate valves, pressure relief valve, air relief valve & flowmeter	$29,200
4	Building structure (approx. 24'x24')	$34,560
5	Building drain to grade	$2,000
6	Three phase power to building	$5,000
7	Building electrical	$25,000
8	Exterior 8" piping to Tank 1	$10,240
9	Pump to waste hydrant & valves	$5,000
10	SCADA link and equipment	$12,000
11	Diesel driven 200 KW standby generator and transfer switch including concrete tub and all-weather enclosure	$80,000
12	Mobilization	$19,000
Subtotal construction		**$407,500**
Engineering @ 10%		**$41,000**
Total		**$448,500**

Prepared by Schiess Associates 7/29/2013

Estimate of Probable Cost for New Well #1 Well House & Pump for Alt-11

Item No.	Item	Estimated Cost
1	Land purchase	$15,000
2	300 Hp vertical turbine pump, column, VFD, filter, transducer	$218,300
3	Building piping, check valves, gate valves, pressure relief valve, air relief valve & flowmeter	$36,500
4	Building structure (approx. 24'x30')	$43,200
5	Building drain to grade	$2,000
6	Three phase power to building	$5,000
7	Building electrical	$25,000
8	Exterior 10" piping to Tank 1	$12,800
9	Pump to waste hydrant & valves	$5,000
10	SCADA link and equipment	$12,000
11	Mobilization	$19,000
Subtotal construction		**$393,800**
Engineering @ 10%		**$39,000**
Total		**$432,800**

Estimate of Probable Cost for New Well #1 Well House & Pump for Alt-12

Item No.	Item	Estimated Cost
1	Land purchase	$15,000
2	300 Hp vertical turbine pump, column, VFD, filter, transducer	$218,300
3	Building piping, check valves, gate valves, pressure relief valve, air relief valve & flowmeter	$36,500
4	Building structure (approx. 24'x30')	$43,200
5	Building drain to grade	$2,000
6	Three phase power to building	$5,000
7	Building electrical	$25,000
8	Exterior 10" piping to Tank 1	$12,800
9	Pump to waste hydrant & valves	$5,000
10	SCADA link and equipment	$12,000
11	Diesel driven 300 KW standby generator and transfer switch including concrete tub and all-weather enclosure	$120,000
12	Mobilization	$25,000
Subtotal construction		**$519,800**
Engineering @ 10%		**$52,000**
Total		**$571,800**

Prepared by Schiess Associates 7/29/2013

Estimate of Probable Cost for New Well #7 Well House & Pump for Alts 8, 10, 12 & 13

Item No.	Item	Estimated Cost
1	200 Hp vertical turbine pump, column, VFD, filter, transducer	$184,800
2	Building piping, check valves, gate valves, pressure relief valve, air relief valve & flowmeter	$29,200
3	Building structure (approx. 20'x24')	$28,800
4	Building drain to grade	$2,000
5	Three phase power to building	$10,000
6	Building electrical	$22,000
7	Exterior 8" piping to Zone 2	$15,200
8	Pump to waste hydrant & valves	$5,000
9	SCADA link and equipment	$12,000
10	Mobilization	$15,000
Subtotal construction		**$324,000**
Engineering @ 15%		**$49,000**
Total		**$373,000**

Prepared by Schiess Associates 7/22/2014

Estimate of Probable Cost for New Tank 3 with Equalization Storage for Zones 2, 3 & 4 - Alt 13

Item No.	Item	Estimated Cost
1	540,000 gallon bolted steel storage tank delivered and installed on gravel pad	$357,200
2	Foundations for center posts	$5,000
3	Earthwork and gravel pad	$40,000
4	Electronic level control for SCADA system	$5,000
5	Mobilization	$20,000
Subtotal construction		**$427,200**
Engineering @ 10%		**$43,000**
Total		**$470,200**

Estimate of Probable Construction Cost to Install Transmission Pipe from Zone 4 to Tank 3 - Alt 13

Item No.	Distribution Improvements	Units	Quantity	Unit Cost	Extended Cost
1	12" PVC pipe	LF	1,950	$45	$87,750
2	12-inch valves	EA	2	$2,500	$5,000
3	12-inch elbows	EA	4	$2,000	$8,000
4	12-inch tee	EA	1	$2,000	$2,000
5	Asphalt Repair	LF	0	$30	$0
6	Traffic Control	LS	0	$500	$0
7	Easements	EA	0	$500	$0
8	Mobilization (5% of bid)	LS	1	$5,000	$5,000
Subtotal construction					**$107,750**
Engineering @ 15%					**$16,200**
Total					**$123,950**
Round to nearest $100					$124,000

Big Bend BPS Estimate of Probable Cost to complete for Alt - 13

Item No.	Item	Estimated Cost
1	(3) 75 Hp booster pumps, VFD's, filters, transducers	$147,600
2	Building piping, check valves, gate valves, pressure relief valve, air relief valve & flowmeter	$50,400
3	Finish existing building structure and landscaping	$50,000
4	Building electrical & mechanical	$30,000
5	SCADA link and equipment	$12,000
6	Mobilization	$15,000
Subtotal construction		**$305,000**
Refresh existing engineering to use split-case single stage centrifugal pumps @ 3%		**$9,000**
Total		**$314,000**

Prepared by Schiess Associates 12/19/2013

Appendix G: Reference Documents

- ISRB Emails (4)
- OMB Circular No. A-94 Appendix C
- 2012 Water Corporation Annual Report
- Amended and Restated Articles of Incorporation
- Bylaws
- Water System Developer Agreement
- Cross Connection Control Program
- Water System Operators Licensing Documentation
- DEQ Original Technical Approval Letter Dated September 17, 2013
- DEQ 2nd Technical Approval Letter Dated January 16, 2014

GMail by Google

Paul Scoresby <pscoresby@schiesseng.com>

Ririe Flow Tests and Needed Fire Flows

Paul Scoresby <pscoresby@schiesseng.com> Mon, Aug 20, 2012 at 4:18 PM
To: "Douglas H. Young" <dyoung@isrb.com>

Doug,

I am working with another client called Comore Loma Water Corporation. We are modeling their water system. They serve about 400 residential customers. They are located in the foothills southeast of the city of Ammon. Do you have any needed fire flow records or flow tests for them? I have never asked ISRB about a strictly residential system before. Bonneville County Fire Department dictates a fire flow of 1,500 gpm. If you do I'll get the appropriate person from the water corporation to request them. Please let me know.

On Wed, Aug 8, 2012 at 8:54 AM, Douglas H. Young <dyoung@isrb.com> wrote:
[Quoted text hidden]

--

Paul H. Scoresby, MS, PE

Schiess & Associates
7103 S. 45th W. I Idaho Falls, Idaho 83402
208-522-1244 I FAX 208-522-9232 I Cell 208-313-2454
pscoresby@schiesseng.com

Gmail by Google

Paul Scoresby <pscoresby@schiesseng.com>

Ririe Flow Tests and Needed Fire Flows

Douglas H. Young <dyoung@isrb.com> Mon, Aug 20, 2012 at 4:21 PM
To: Paul Scoresby <pscoresby@schiesseng.com>

Paul,

We do not just for residential. The flow test I have for there is really old so I am not going to forward it.

Doug Young

ISRB

208-343-5483 x 21

From: Paul Scoresby [mailto:pscoresby@schiesseng.com]
Sent: Monday, August 20, 2012 4:19 PM
To: Douglas H. Young
Subject: Re: Ririe Flow Tests and Needed Fire Flows

[Quoted text hidden]

GMail by Google

Paul Scoresby <pscoresby@schiesseng.com>

Ririe Flow Tests and Needed Fire Flows

Paul Scoresby <pscoresby@schiesseng.com> Mon, Aug 20, 2012 at 5:21 PM
To: "Douglas H. Young" <dyoung@isrb.com>

Fair enough. Thanks for the response. I suppose there are no buildings up there that you have in your system that require more than 1,500 gpm fire flow. If there are please send me that list.

[Quoted text hidden]

Gmail by Google

Paul Scoresby <pscoresby@schiesseng.com>

Ririe Flow Tests and Needed Fire Flows

Douglas H. Young <dyoung@isrb.com> Tue, Aug 21, 2012 at 8:14 AM
To: Paul Scoresby <pscoresby@schiesseng.com>

We do not have anything up that way I believe its just dwelling property.

Doug Young

ISRB

208-343-5483 x 21

From: Paul Scoresby [mailto:pscoresby@schiesseng.com]
Sent: Monday, August 20, 2012 5:22 PM

[Quoted text hidden]

[Quoted text hidden]

APPENDIX C
(Revised December 2011)

DISCOUNT RATES FOR COST-EFFECTIVENESS, LEASE PURCHASE, AND RELATED ANALYSES

Effective Dates. This appendix is updated annually. This version of the appendix is valid for calendar year 2012. A copy of the updated appendix can be obtained in electronic form through the OMB home page at http://www.whitehouse.gov/omb/circulars_a094/a94_appx-c/. The text of the Circular is found at http://www.whitehouse.gov/omb/circulars_a094/, and a table of past years' rates is located at http://www.whitehouse.gov/sites/default/files/omb/assets/a94/dischist.pdf. Updates of the appendix are also available upon request from OMB's Office of Economic Policy (202-395-3381).

Nominal Discount Rates. A forecast of nominal or market interest rates for calendar year 2012 based on the economic assumptions for the 2013 Budget are presented below. These nominal rates are to be used for discounting nominal flows, which are often encountered in lease-purchase analysis.

Nominal Interest Rates on Treasury Notes and Bonds of Specified Maturities (in percent)

3-Year	5-Year	7-Year	10-Year	20-Year	30-Year
1.6	2.1	2.5	2.8	3.5	3.8

Real Discount Rates. A forecast of real interest rates from which the inflation premium has been removed and based on the economic assumptions from the 2013 Budget is presented below. These real rates are to be used for discounting constant-dollar flows, as is often required in cost-effectiveness analysis.

Real Interest Rates on Treasury Notes and Bonds of Specified Maturities (in percent)

3-Year	5-Year	7-Year	10-Year	20-Year	30-Year
0.0	0.4	0.7	1.1	1.7	2.0

Analyses of programs with terms different from those presented above may use a linear interpolation. For example, a four-year project can be evaluated with a rate equal to the average of the three-year and five-year rates. Programs with durations longer than 30 years may use the 30-year interest rate.

No. **C 49380**

Due no later than Apr 30, 2013
Annual Report Form

2. Registered Agent and Address
(NO PO BOX)

DENNIS BELL
5353 E SKIDMORE
IDAHO FALLS ID 83406

Return to:

SECRETARY OF STATE
700 WEST JEFFERSON
PO BOX 83720
BOISE, ID 83720-0080

NO FILING FEE IF RECEIVED BY DUE DATE

1. Mailing Address: Correct in this box if needed.

COMORE LOMA WATER CORPORATION
DENNIS BELL
5353 E SKIDMORE
IDAHO FALLS ID 83406

3. New Registered Agent Signature:*

4. Corporations: Enter Names and Business Addresses of President, Secretary, and Directors. Treasurer (optional).

Office Held	Name	Street or PO Address	City	State	Country	Postal Code
TREASURER	PAUL CURTIS	5264 E. SKIDMORE DR.	IDAHO FALLS	ID	USA	83406
PRESIDENT	JOHN BUTTLES	5395 E. NEVESO CIR.	IDAHO FALLS	ID	USA	83406
SECRETARY	CAROLYN EINERSON	5220 REDONDA CIR	IDAHO FALLS	ID	USA	83406

5. Organized Under the Laws of:

ID
C 49380

6. Annual Report must be signed.*

Signature: Dennis R. Bell — Date: 02/14/2013

Name (type or print): Dennis R. Bell — Title: System Manager

Processed 02/14/2013

* Electronically provided signatures are accepted as original signatures.

AMENDED AND RESTATED

ARTICLES OF INCORPORATION

OF

COMORE LOMA WATER CORPORATION

Pursuant to Idaho Code §§ 30-1-59 and 30-1-64, the undersigned corporation hereby amends its Articles of Incorporation by deleting Articles I through VII, and by adopting new Articles I through VII, as set forth herein, and adopts the following Amended and Restated Articles of Incorporation for such corporation.

ARTICLE I

NAME OF CORPORATION

That the name of the corporation shall be COMORE LOMA WATER CORPORATION.

ARTICLE II

NONPROFIT STATUS

The corporation shall be a nonprofit corporation within the meaning of the Idaho Nonprofit Corporation Act. It is the intent of the corporation to form a mutual nonprofit water corporation, as that term is used and defined in Idaho Code § 61-104.

ARTICLE III

DURATION

The period of this corporation's duration is perpetual.

ARTICLE IV

PURPOSE

The purpose for which this corporation is formed are to engage in the business of constructing, owning, maintaining, improving, expanding and operation a water system for the owners and possessors of the described real property in Appendix A and to conduct all lawful business incident thereto.

ARTICLE V

REGULATIONS OF CORPORATE AFFAIRS

The following provisions are made for the regulation of internal corporate affairs:

1. **Membership.** This corporation shall have no capital stock. Membership in the corporation shall be granted on the basis of one membership per lot (excluding well lots) to the owner or owners of such lot located within the hereinabove described tracts, and to the owner of each lot in all other tracts as may from time to time be added to the service area of the corporation by the Board of Directors. Such membership rights shall be appurtenant to said lots and cannot be assigned or transferred apart from the ownership of said lots. The corporation shall have no affirmative duty to ascertain the ownership of any lot, but may relay on its corporate records of property ownership until proof of lot ownership or transfer of lot ownership is to the reasonable satisfaction of the corporation. Membership in the corporation shall not be subject to approval or disapproval by the Board of Directors or members of the corporation, but shall be dependent upon ownership of a lot and proper proof of such ownership.

2. **Voting and other rights.** Each member owning a lot to which a water line has been duly laid in (but not necessarily connected) to the water system owned by the corporation shall be entitled to one vote for each such lot owned by him or her. Members owning a lot in common due to multiple ownership rights in any certain lot shall be entitled to cast but one common vote for such lot. All rights and interests of all members of the corporation shall be in proportion to the number of lots owned by the member to the total number of such lots. No expulsion of members or cancellation of voting rights shall be permitted; however, such rights may be suspended in case of nonpayment of charges and assessments owned to the corporation as provided hereafter.

3. **Water rights.** On a per lot basis, each membership shall represent the right, subject to these articles, the bylaws of the corporation, and any contract between the member and the corporation, to the beneficial use of the water, water rights, water storage facilities and other water rights, privileges and benefits of the corporation, without priority of use over any membership per lot; PROVIDED, HOWEVER, that nothing contained herein shall guarantee to any member any certain amount of water flow or any level of water pressure, it being understood that fluctuations in water flow and pressure can and do occur in the normal course of operation of a water system.

4. **Cost of management and operation.** The cost of constructing, owning, maintaining, improving, expanding and operating the water system and the business of the corporation shall be met by hook up fees (except as provided in the Water System Development Agreement), water fees, and other charges for the delivery of water to members, as determined from time to time by the Board of Directors. Whenever the Board of Directors deems it advisable to fix any of said fees or charges, said fees and charges shall be fixed by equitably prorating the cost for that year among all members, which costs, in the discretion of the Board, may include items for depreciation and maintenance of pipelines and for readiness to deliver water. Said fees and charges may not include any profit margin for distribution to the members of the corporation, but shall include amounts calculated to provide an adequate reserve which the corporation may need or desire to enlarge or improve the water system or to meet such extraordinary expenses as may, from time to time, occur. All such fees and charges shall be fixed in the manner required by any applicable laws, bylaws of the corporation and resolutions of the Board of Directors, all so as to preserve the private ownership of the water rights of the corporation and the delivery of its water to its members as a mutual non-profit water corporation.

5. **Assessment of members.** Each lot owner of the corporation shall be assessable to the extent deemed necessary by the Board of Directors to meet the needs of the corporation to furnish adequate water service to its members.

6. **Nonpayment of charges and assessments.** Suspension of services and use of the water and facilities provided by the corporation shall be permitted for any period of time that charges or assessments due and owing to the corporation from its members remain unpaid, after thirty (30) days notice of delinquency is given to said members, and after which the delinquency remains uncured; provided that upon full payment of all delinquent charges and assessment there shall be a prompt restoration of service to said members. Liens for non-payment of charges and

assessments due and owing the corporation are permitted as provided by law. The corporation may refuse to record the transfer of any lot ownership incident to a change in ownership of any lot while charges or assessments with regard to that lot remain unpaid, and it may suspend any such member's privilege of voting in the corporation for the period such charges or assessments remain unpaid.

ARTICLE VI

REGISTERED OFFICE AND AGENT

The current registered office of the corporation is PO Box 1863, Idaho Falls, Idaho 83403, and the current registered agent is the current Comore Loma Water Corporation President.

ARTICLE VII

BOARD OF DIRECTORS

The business and affairs of the corporation shall be managed and controlled by a Board of Directors consisting of not less than three (3) nor more than (7) persons, as established from time to time by the bylaws of the corporation.

Dated this 1st day of March 2013

COMORE LOMA WATER CORPORATION

By: John Buttles (signature on file)

President

ATTEST:

By: Carolyn Einerson (signature on file)

Secretary

Appendix A of the Comore Loma Water Corporation Articles of Incorporation

This Appendix lists all of the real property in the Comore Loma Divisions served by the Comore Loma Water Corporation water system, less any real property that is excluded. This list will be modified as directed by the Board of Directors, from time to time as new divisions are added.

Exclusions:

These real property are excluded from being served by the Comore Loma Water Corporation water system.

> Lots 1, 2 and 3, Block 2, Division 1, Comore Loma Subdivision.

Division 1 Boundary Description

BOUNDARY DESCRIPTION

Beginning at the Northeast Corner of Section
1, Township 1 North, Range 38 East of the
Boise Meridian and running thence South
1°03'32" West, 1570.00 feet; thence South 50°52
West, 1125.42 feet; thence N66°51'04"W 219.29
feet; thence N07°36'21"E 292.61 feet;
thence N23°24'43"W 634.83 feet; thence
North 1321.19 feet; thence East 1317.15
feet to the point of beginning containi
56.97 acres.

Division 2 Boundary Description

F ... UNNIN

BOUNDARY DESCRIPTION

Beginning at a point that is S. 89° 59' 38" W. along the section line 2417.34 feet and N. 1°17' 30" W. 13.32 feet from the Southeast corner of Section 1, Township 1 North, Range 38 East of the Boise Meridian; running thence S. 89° 41' 26" E. 392.00 feet; thence N. 33°45' E. 325.00 feet; thence N. 70°45' E. 200.00 feet; thence N. 6° 16' 42" W. 432.61 feet; thence N. 32°03'20" E. 70.64 feet; thence N. 1°17'30" W. 1773.00 feet; thence N. 31° 49' E. 574.06 feet; thence N. 56° 58' 15" E. 520.39 feet to the southerly most corner of Lot 7, Block 1, Comore Loma Subdivision, Division No. 1; thence N. 23° 24' 43" W. 634.83 feet; thence West 607.29 feet to a point on a curve with a radius of 225.88 feet and a tangent that bears S. 18° 43' 28" E.; thence to the right along said curve 78.41 feet; thence S. 1° 10' W. 162.83 feet; thence West 683.25 feet; thence S. 1° 17' 30" E. 3711.54 feet to the point of beginning; containing 77.71 acres more or less.

Division 3 Boundary Description

T. CUNN

Boundary Description

Beginning at a point that is N. 1°03'32" E. along the section line 1287.41 feet and N. 55° 51' 30" W. 1133.69 feet from the Southeast Corner of Section 1, Township 1 North, Range 38 East of the Boise Meridian; running thence S. 2°03'20" W. 97.23 feet; thence N. 84°54'44" W. 106.00 feet; thence S. 51°10'32" W. 592.50 feet; thence S. 88°42'30" W. 195.00 feet to the East line of Comore Loma Division No. 2; thence N. 1°17'30" W. along said Division No. 2 1150.00 feet; thence N. 31°49' E. 108.00 feet; thence S. 56°30' E. 165.00 feet; thence S. 41°00' E. 910.00 feet to the point of beginning, containing 13.10 acres more or less.

Division 4 Boundary Description

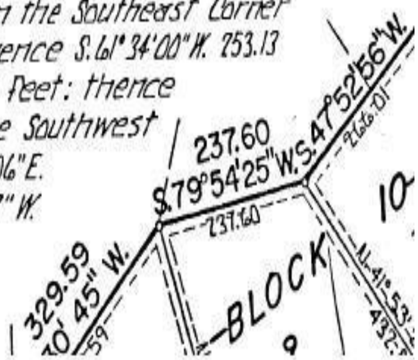
BOUNDARY DESCRIPTION

Beginning at a point that is N.89°59'38"E. along the Section line 1360.16 feet from the Southwest Corner of Section 1 Township 1 North, Range 38 East of the Boise Meridian: running thence S.0°31'06"E. 1090.42 feet: thence N.45°30'45"E. 329.59 feet: thence N.79°54'25"E. 237.60 feet: thence N.47°52'56"E. 424.01 feet: thence S.83°56'50"E. 549.38 feet: thence N.61°34'00"E. 253.13 feet: thence N. 86°36'49"E. 318.19 feet: thence N. 9°58'01"E. 466.69 feet: thence N.88°44'48"W. 170.00 feet: thence N.89°41'26"W. 392.00 feet: thence N. 1°17'30"W. 1843.30 feet: thence S. 26°22'54"W. 127.85 feet: thence S. 9°15'34" W. 190.55 feet: thence S. 20°34'37" W. 237.44 feet: S. 9°37'15"W. 119.71 feet: thence S. 33°17'27" W. 135.70 feet: thence S.17°04'22"W. 293.08 feet: thence S. 38°58'14" W. 105.34 feet: thence S. 6°20'41" W. 119.42 feet: thence S. 58°19'28"W. 310.15 feet: thence S. 57°02'38" W. 463.98 feet: thence S. 60°26'24" W. 205.43 feet: thence S.42°37'04"W. 139.40 feet to the point of beginning, Containing 48.42 Acres more or less.

Division 5 Boundary Description

BOUNDARY DESCRIPTION

Beginning at a point that is S.0°17'00"E. along the section line 1310.64 feet from the Northwest Corner of Section 12 Township 1 North Range 38 East of the Boise Meridian: Running thence S.0°17'00"E. 482.61 feet: thence N.89°43'00"E. 40.00 feet to a point on a curve. Said curve having a radius of 20.00 feet and a central angle of 147°22'02" and a tangent bearing of N.0°17'00" thence to the right along said curve 51.44 feet: thence N.57°05'02"E. 36.00 feet: thence S.32°54'58"E. S.89°54'22"E. 711.04 feet: thence S.0°25'11"E. 13.26 feet: thence S.89°53'28"E. 1458.41 feet: thence North 690.00 feet: thence N.36°47'32"W. 164.00 feet: thence North 294.00 feet: thence N.17°33'36"E. 266.47 feet: thence N.66°51'45"W. 192.00 feet: thence N.28°43'07"E. 830.25 feet to a point in the South line of Comore Loma Division No. 4 that is S.86°36'49"W. 195.83 feet from the Southeast Corner thereof: thence along said south line S.86°36'49"W. 122.36 feet: thence S.61°34'00"W. 253.13 feet: thence N.83°56'50"W. 549.38 feet: thence S.47°52'56"W. 424.01 feet: thence S.79°54'25"W. 237.60 feet: thence S.45°30'45"W. 329.59 feet to the Southwest Corner of said Comore Loma Division No. 4: thence S.0°31'06"E. 213.36 feet: thence S.89°50'51"W. 895.57 feet: thence S.89°11'57"W. 299.58 feet: thence S.89°54'07"W. 170.36 feet to the Point of Beginning. Containing 97.70 Acres more or less.



NOTES

Division 6 Boundary Description

BOUNDARY DESCRIPTION

Beginning at a point that is S.01°03'32"W. along the Section line 3163.55 feet from the Northeast Corner of Section 1, Township 1 North, Range 38 East of the Boise Meridian; running thence S.01°03'32"W. 920.00 feet; thence N.53°15'36"W. 1100.33 feet; thence N.41°00'00"W. 993.96 feet along the North Boundary of Comore Loma Division No. 3; thence N.56°30'00"W. 165.00 feet along said Division No. 3 to the most Southerly corner of Lot 2, Block 4, Comore Loma, Division No. 2; thence N.31°49'00"E. 466.06 feet along the East Boundary of said Division No. 2; thence N.56°58'15"E. 520.39 feet along said Division No. 2 boundary to the South line of Comore Loma, Division No. 1; thence S.07°36'21"W. 292.61 feet along said Division No. 1; thence S.66°51'04"E. 219.29 feet along said Division No. 1; thence S.38°00'00"E. 655.00 feet; thence N.81°45'00"E. 78.74 feet; thence S.08°15'00"E. 345.02 feet; thence S.83°18'24"E. 315.00 feet to the POINT OF BEGINNING.

CONTAINING 34.45 ACRES

Division 7 Boundary Description

BOUNDARY DESCRIPTION

Beginning at a point that is S.01°03'32"W. along the Section line 3163.55 feet from the Northeast Corner of Section 1, Township 1 North, Range 38 East of the Boise Meridian; running thence S.01°03'32"W. 920.00 feet; thence N.53°15'36"W. 1100.33 feet; thence N.41°00'00"W. 993.96 feet along the North Boundary of Comore Loma Division No. 3; thence N.56°30'00"W. 165.00 feet along said Division No. 3 to the most Southerly corner of Lot 2, Block 4, Comore Loma, Division No. 2; thence N.31°49'00"E. 466.06 feet along the East Boundary of said Division No. 2; thence N.56°58'15"E. 520.39 feet along said Division No. 2 boundary to the South line of Comore Loma, Division No. 1; thence S.07°36'21"W. 292.61 feet along said Division No. 1; thence S.66°51'04"E. 219.29 feet along said Division No. 1; thence S.38°00'00"E. 655.00 feet; thence N.81°45'00"E. 78.74 feet; thence S.08°15'00"E. 345.02 feet; thence S.83°18'24"E. 315.00 feet to the POINT OF BEGINNING.

CONTAINING 34.45 ACRES

Division 8 Boundary Description

BOUNDARY DESCRIPTION

Beginning at a point that is N.89°59'38"E. 3319.81 feet along the section line and S.9°58'01"W. 459.16 feet from the Northwest Corner of Section 12, Township 1 North, Range 38 East of the Boise Meridian; said point being the Southeast Corner of Lot 12, Block 8, Comore Loma, Division No. 4, Bonneville County, Idaho; running thence S.19°38'24"W. 138.90 feet; thence S.70°58'10"E. 218.65 feet; thence N.51°01'29"E. 97.06 feet; thence S.28°36'28"E. 369.85 feet to a point on a curve with a radius of 389.83 feet and a chord bearing N.48°47'31"E. 24.38 feet; thence to the left along said curve 24.39 feet through a central angle of 3°35'03"; thence N.47°E. 49.60 feet; thence S.43°45'46"E. 402.34 feet; thence N.34°09'56"E. 220.34 feet; thence N.87°04'02"E. 135.92 feet; thence N.76°37'20"E. 197.23 feet; thence N.72°19'59"E. 358.31 feet; thence S.7°06'47"E. 135.00 feet; thence S.7°03'15"W. 155.00 feet; thence S.15°54'29"E. 218.40 feet; thence S.0°56'32"W. 224.90 feet; thence S.49°50'20"W. 295.91 feet; thence S.73°40'21"W. 226.17 feet; thence S.39°54'56"W. 57.85 feet; thence S.89°24'56"W. 356.32 feet; thence N.68°50'55"W. 61.71 feet; thence S.26°30'38"W. 512.85 feet; thence S.52°23'28"E. 210.00 feet; thence S.21°13'03"W. 194.10 feet; thence N.71°48'53"W. 426.45 feet; thence S.10°05'03"W. 456.90 feet; thence N.89°53'28"W. 498.52 feet; thence S.1°30'E. 350.00 feet; thence N.89°53'28"W. 1233.09 feet; thence S.28°44'40"W. 415.69 feet; thence N.22°40'14"W. 232.91 feet; thence N.0°13'59"W. 778.21 feet to the South line of Lot 3, Block 12, Comore Loma, Division No. 5; thence N.89°54'22"W. 203.44 feet to the Southwest Corner of Said Lot 3; thence N.20°07'34"E. 112.03 feet along the lot line; thence N.18°40'22"E. 200.01 feet to the Northwest Corner of Said Lot 3, being a point on a curve with a radius of 195.59 feet and a chord bearing S.61°14'30"E. 166.09 feet; thence to the left along said curve 171.54 feet through a central angle of 50°15'; thence S.86°22'E. 210.00 feet to a point of curve with a radius of 20.00 feet and a chord bearing S.61°22'09"E. 16.90 feet; thence to the right along said curve 17.45 feet through a central angle of 49°59'41" to a point of reverse curve with a radius of 50.00 feet and a chord bearing N.78°29'50"E. 90.73 feet; thence to the left along said curve 113.68 feet through a central angle of 130°15'43"; thence S.76°38'02"E. 287.46 feet; thence N.79°42'08"E. 518.80 feet to a point of curve with a radius of 20.00 feet and a chord bearing S.23°29'51"W. 16.90 feet; thence to the right along said curve 17.45 feet through a central angle of 49°59'41" to a point of reverse curve with a radius of 50.00 feet and a chord bearing N.88°30'E.; thence to the left along said curve 244.34 feet through a central angle of 279°59'23" to a point of reverse curve with a radius of 20.00 feet and a chord bearing N.26°29'51"W. 16.90 feet; thence to the right along said curve 17.45 feet through a central angle of 49°59'41"; thence S.78°10'58"E. 344.42 feet to the Easterly boundary line of Said Comore Loma, Division No. 5; thence along said Easterly boundary the following six (6) courses: North 505.00 feet; thence N.36°47'32"W. 164.00 feet; thence North 294.00 feet; thence N.17°33'36"E. 266.47 feet; thence N.66°51'45"W. 192.00 feet; thence N.28°43'07"E. 830.25 feet to the South line of the aforementioned Lot 12, Block 8, Comore Loma, Division No. 4; thence N.86°36'49"E. 195.83 feet along said lot line to the POINT OF BEGINNING.

CONTAINING 97.91 acres.

Division 9 Boundary Description

BOUNDARY DESCRIPTION

Beginning at the Southeast Corner of Section 1, Township 1 North, Range 38 East of the Boise Meridian; running thence N.01°03'36"E. 320.00 feet along the East line of said Section 1 to the TRUE POINT OF BEGINNING; running thence N.88°56'24"W. 310.00 feet; thence S.09°20'08"E. 294.14 feet; thence S.20°10'32"E. 280.00 feet crossing into Section 12, Township 1 North, Range 38 East of the Boise Meridian; thence S.05°31'47"E. 314.85 feet; thence S.55°04'46"E. 230.31 feet crossing into Section 7, Township 1 North, Range 39 East of the Boise Meridian; thence S.61°21'32"E. 208.94 feet; thence S.04°38'28"E. 286.27 feet; thence S.09°01'01"E. 387.13 feet; thence S.08°16'22"W. 338.62 feet; thence S.18°02'32"W. 619.23 feet; thence S.12°19'02"W. 298.04 feet; thence N.77°42'25"W. 997.74 feet crossing into the aforementioned Section 12; thence S.16°55'42"W. 215.62 feet; thence N.68°46'57"W. 295.00 feet; thence S.21°13'03"W. 70.00 feet; thence N.68°46'57"W. 60.00 feet to the Southeast Corner of Lot 36, Block 12, Comore Loma, Division No. 8, Bonneville County, Idaho; thence along said Division 8 boundary, the following fifteen (15) courses: N.21°13'03"E. 194.10 feet; thence N.52°23'28"W. 210.00 feet; thence N.26°30'38"E. 512.85 feet; thence S.68°50'55"E. 61.71 feet; thence N.89°24'56"E. 356.32 feet; thence N.39°54'56"E. 57.85 feet; thence N.73°40'21"E. 226.17 feet; thence N.49°50'20"E. 295.91 feet; thence N.00°56'32"E. 224.90 feet; thence N.15°54'29"W. 218.40 feet; thence N.07°03'15"E. 155.00 feet; thence N.07°06'47"W. 135.00 feet; thence S.72°19'59"W. 358.31 feet; thence S.76°37'20"W. 197.23 feet; thence S.87°04'02"W. 135.92 feet to the Northwest Corner of Lot 36, Block 11 of said Comore Loma, Division No. 8; thence S.34°09'56"W. 553.90 feet to the Southwest Corner of said Lot 36 being on the Northerly right-of-way line of Ensanada Circle; thence N.71°59'11"W. 38.73 feet to a point of curve in said right-of-way having a radius of 336.67 feet and a 345.50 foot long chord bearing N.41°06'55"W.; thence along said curve to the right 362.88 feet through a central angle of 61°44'32"; thence N.10°14'39"W. 92.67 feet along said right-of-way; thence N.31°42'05"E. 26.74 feet to a point on a curve in the Southeasterly right-of-way line of York Road, having a radius of 449.83 feet and a 207.32 foot long chord bearing N.60°19'24"E; thence along said curve to the left 209.20 feet through a central angle of 26°38'48"; thence N.47°00'00"E. 50.40 feet to the most Northerly Corner of Lot 34, Block 11 of said Comore Loma, Division No. 8; thence along said Division No. 8 boundary the following seven (7) courses: N.43°45'46"W. 60.00 feet; thence S.47°00'00"W. 49.60 feet to a point of curve having a radius of 389.83 feet and a 24.38 foot long chord bearing S.48°47'31"W.; thence along said curve to the right 24.39 feet through a central angle of 3°35'03"; thence N.28°36'28"W. 369.85 feet; thence S.51°01'29"W. 97.06 feet; thence N.70°58'10"W. 218.65 feet; thence N.19°38'24"E. 138.90 feet to the Southeast Corner of Lot 12, Block 8, Comore Loma, Division No. 4; thence N.09°58'01"E. 466.69 feet crossing into the aforementioned Section 1, to the Northeast Corner of Lot 11, Block 8 of said Division No. 4; thence N.88°44'48"W. 170.00 feet to the Southwest Corner of Lot 3, Block 8, Comore Loma, Division No. 2; thence N.33°45'00"E. 325.00 feet to the Southeast Corner of said Lot 3; thence N.70°45'00"E. 200.00 feet to the Southeast Corner of Lot 4, Block 8 of said Division No. 2; thence S.49°56'10"E. 12.87 feet; thence N.68°06'24"E. 177.91 feet; thence N.48°26'03"E. 128.75 feet; thence N.72°29'54"E. 172.16 feet; thence N.57°58'52"E. 136.42 feet; thence N.42°56'56"E. 54.22 feet; thence N.79°19'51"E. 369.67 feet; thence N.86°37'13"E. 350.98 feet; thence N.69°26'48"E. 60.00 feet to a point on a curve having a radius of 187.63 feet and a 35.24 foot long chord bearing S.25°56'31"E.; thence along said curve to the left 35.29 feet through a central angle of 10°46'37" to a point of reverse curve having a radius of 268.48 feet and a 124.30 foot long chord bearing S.17°56'45"E; thence along said curve to the right 125.44 feet through a central angle of 26°46'08"; thence S.88°56'24"E. 256.01 feet to a point on the East line of the aforementioned Section 1; thence S.01°03'36"W. 290.00 feet to the TRUE POINT OF BEGINNING.

CONTAINING: 104.88 acres.

Division 10 Boundary Description

BOUNDARY DESCRIPTION

Beginning at the most Northerly Corner of Lot 1, Block 21, Comore Loma, Division No. 10, Bonneville County, Idaho; said POINT OF BEGINNING being on the Southwesterly right-of-way line of Middlefork Road at a point which is N.89°52'23"E. 992.76 feet along the section line and S.48°06'28"E. 1076.15 feet from the Northwest Corner of Section 6, Township 1 North, Range 39 East of the Boise Meridian; running thence S.48°06'28"E. 1087.61 feet along said right-of-way line to the Northwest Corner of Lot 2 of said Block 21; thence S.42°23'42"W. 362.57 feet; thence S.30°49'57"W. 296.48 feet; thence S.38°42'57"W. 253.71 feet to the Northeasterly line of Lot 14, Block 21 of Division No. 14 of Comore Loma; thence along said Division No. 14 boundary, the following seven (7) courses: N.54°38'42"W. 191.68 feet; thence N.27°42'18"W. 188.28 feet; thence N.73°16'16"W. 282.56 feet; thence N.58°40'51"W. 151.34 feet; thence N.41°27'27"W. 142.38 feet; thence N.31°09'52"W. 154.77 feet; thence N.45°44'12"W. 79.62 feet to the Northwest Corner of Lot 19 of said Block 21, being on the Southeasterly right-of-way line of Tappan Falls Drive; thence N.39°43'56"E. 925.97 feet along said right-of-way line; thence N.85°48'44"E. 28.81 feet to the POINT OF BEGINNING.

CONTAINING: 24.24 acres.

Division 11 Boundary Description

BOUNDARY DESCRIPTION

Beginning at a point that is N.0°17'00"W. 2366.12 feet along the section line and S.89°53'28"E. 2807.27 feet from the Southwest Corner of Section 12, Township 1 North, Range 38 East of the Boise Meridian; said point being on the South line of Lot 18A, Block 12, Comore Loma, Division No. 8, Bonneville County, Idaho; running thence S.89°53'28"E. 498.52 feet to the Southeast Corner of said Lot 18A; thence N.10°05'03"E. 456.90 feet to the Northeast Corner of said Lot 18A; thence S.71°48'53"E. 426.45 feet to the Southeast Corner of Lot 36, Block 12 of said Division No. 8; thence S.68°46'57"E. 60.00 feet to the Easterly right-of-way line of Bowman Lane; thence N.21°13'03"E. 70.00 feet along said right-of-way to the Southwest Corner of Lot 2, Block 13, Division No. 9 of said Comore Loma; thence S.68°46'57"E. 295.00 feet to the Southeast Corner of said Lot 2; thence S.16°55'42"W. 200.56 feet; thence S.56°00'20"E. 463.46 feet; thence S.1°00'00"E. 500.00 feet; thence S.89°50'00"E. 25.67 feet; thence S.0°10'00"W. 358.59 feet to the North line of the Southeast 1/4 of the Southeast 1/4 of said Section 12; thence N.89°51'01"W. 629.08 feet to the Northwest Corner of said Southeast 1/4 of the Southeast 1/4; thence S.0°07'59"E. 720.33 feet along the West line of said Southeast 1/4 of the Southeast 1/4; thence S.86°43'44"W. 122.87 feet; thence N.80°23'57"W. 919.28 feet; thence N.1°30'00"W. 1629.93 feet to the POINT OF BEGINNING.

CONTAINING: 61.68 acres.

Division 12 Boundary Description

BOUNDARY DESCRIPTION

Beginning at a point that is N.89°52'23"E. 797.19 feet along the section line and S.0°07'37"E. 903.38 feet from the North 1/4 Corner of Section 6, Township 1 North, Range 39 East of the Boise Meridian; said point being the Northeast Corner of Lot 6, Block 23, Comore Loma, Division No. 10, Bonneville County, Idaho; running thence N.45°48'15"E. 129.17 feet; thence N.30°13'44"E. 98.53 feet; thence N.24°31'59"E. 266.67 feet; thence N.73°16'26"E. 110.86 feet; thence S.36°12'26"E. 204.94 feet; thence S.24°56'47"E. 180.87 feet; thence S.23°05'01"E. 110.01 feet; thence S.23°56'26"E.145.53 feet; thence S.26°18'06"E. 221.47 feet; thence S.41°55'19"E. 60.97 feet; thence S. 5°42'30" W. 393.46 feet to the Northeast Corner of Lot 2 Block 24 of the aforementioned Division No. 10; thence N.80°46'24"W. 376.60 feet to the Northwest Corner of Lot 2, Block 24, of the aforementioned Division No. 10; thence N.2°00'51"W. 214.39 feet to the Northeast Corner of Lot 1 of said Block 24; thence N.75°10'37"W. 264.14 feet to the most Easterly Corner of Lot 6, Block 23 of the aforementioned Division No. 10; thence N.16°54'36"W. 425.49 feet to the POINT OF BEGINNING.

CONTAINING: 12.55 acres.

Division 13 Boundary Description

BOUNDARY DESCRIPTION

Beginning at a point that is S.01°03'36"W. along the section line common to Section 1, Township 1 North, Range 38 East of the Boise Meridian and Section 6, Township 1 North Range 39 East of the Boise Meridian a distance of 212.40 feet from the East 1/4 Corner of said Section 1; running thence S.01°03'36"W. 308.26 feet along said section line to the Northeast Corner of Lot 29, Block 4, Comore Loma, Division No. 7, Bonneville County, Idaho; thence S.32°50'00'E. 514.61 feet; thence S.57°10'00"W. 193.51 feet; thence N.32°50'00"W. 130.00 feet; thence N.49°12'52"W. 70.02 feet to the aforementioned section line; thence S.01°03'36"W. 537.58 feet along said section line to the Southeast Corner of Lot 28, Block 4 of said Division No. 7; thence N.53°15'36"W. 1100.33 feet to the Southeast Corner of Lot 26, Block 4 of said Division No. 7; thence N.29°00'23"E. 419.03 feet to the Northeast Corner of said Lot 26, being on the Southwest right-of-way line of Skidmore Drive; thence along said Skidmore Drive right-of-way the following six (6) courses; S.43°05'39"E. 76.28 feet to a point of curve having a radius of 60.00 feet and a 40.45 foot long chord bearing S.23°23'38"E.; thence to the right along said curve 41.26 feet through a central angle of 39°24'02" to a point of reverse curve having a radius of 50.00 feet and a 77.27 foot long chord bearing N.46°54'21"E.; thence to the left along said curve 225.85 feet through a central angle of 258°48'04" to a point of reverse curve having a radius of 60.00 feet and a 40.52 foot long chord bearing N.62°47'40"W.; thence to the right along said curve 41.26 feet through a central angle of 39°24'02"; thence N.43°05'39"W. 64.84 feet to a point of curve having a radius of 20.00 feet and a 28.28 foot long chord bearing N.01°54'21"E.; thence to the right along said curve 31.42 feet through a central angle of 90°00'00" to the Southeasterly right-of-way line of Rio Seco Drive, thence along said right-of-way, the following three (3) courses; N.46°54'21"E. 162.82 feet to a point of curve having a radius of 182.14 feet and a 109.07 foot long chord bearing N.64°19'41"E; thence to the right along said curve 110.77 feet through a central angle of 34°50'39"; thence N.81°45'00"E. 78.74 feet; thence N.08°15'00"W. 50.00 feet to the Northerly right-of-way line of said Rio Seco Drive; thence N.81°45'00"E. 12.41 feet to a point of curve having a radius of 539.65 feet and a 362.95 foot long chord bearing S.78°35'58"E.; thence to the right along said curve 370.16 feet through a central angle of 39°18'04" to the POINT OF BEGINNING.

CONTAINING: 18.13 acres.

Division 14 Boundary Description

BOUNDARY DESCRIPTION

Beginning at the Northwest Corner of Section 6, Township 1 North, Range 39 East of the Boise Meridian; running thence N.89°52'23"E. 1050.00 feet along the section line; thence S.13°40'11"W. 763.62 feet to the TRUE POINT OF BEGINNING, being the most Northerly Corner of Lot 5, Block 20, Comore Loma, Division No. 10, Bonneville County, Idaho; running thence S.56°59'27"E. 619.46 feet to the most Easterly Corner of said Lot 5; thence S.39°43'56"W. 409.74 feet to the most Southerly Corner of said Lot 5; thence along the Southwesterly line of said Division No. 10, the following eight (8) courses: S.50°16'04"E. 60.00 feet; thence S.45°44'12"E. 79.62 feet; thence S.31°09'52"E. 154.77 feet; thence S.41°27'27"E. 142.38 feet; thence S.58°40'51"E. 151.34 feet; thence S.73°16'16"E. 282.56 feet; thence S.27°42'18"E. 188.28 feet; thence S.54°38'42"E. 261.68 feet; thence S.12°20'00"E. 400.00 feet; thence S.13°11'29"W. 279.59 feet; thence S.70°33'30'W. 90.00 feet; thence S.15°04'23"E. 495.40 feet; thence S.46°40'29"W. 218.82 feet; thence S.81°56'01"W. 269.17 feet; thence S.76°40'14"W. 346.75 feet; thence N.54°05'29"W. 180.16 feet; thence N.65°48'30"W. 293.66 feet; thence N.59°56'35"W. 404.00 feet; thence N.79°18'12"W. 181.23 feet; thence N.57°52'55"W. 547.27 feet; thence N.0°16'18"E. 766.29 feet; thence N.77°06'33"E. 117.12 feet to a point of curve having a radius of 245.53 feet and a 62.80 foot long chord bearing N.69°45'43"E.; thence to the left along said curve 62.97 feet through a central angle of 14°41'39"; thence S.78°10'49"E. 260.13 feet; thence S.74°22'07"E. 230.00 feet; thence N.1°08'00"W. 250.00 feet; thence N.63°57'55"E. 80.00 feet; thence N.10°10'00"W. 380.00 feet; thence N.13°10'41"E. 408.92 feet; thence N.46°51'29"W. 158.84 feet to the most Westerly Corner of the aforementioned Lot 5; thence N.42°16'53"E. 166.99 feet to an angle point in the Northwesterly line of said Lot 5; thence N.37°33'02"E. 203.90 feet to the POINT OF BEGINNING.

CONTAINING: 81.92 acres.

Division 15 Boundary Description

BOUNDARY DESCRIPTION

Beginning at a point on the Southerly boundary of Lot 6, Block 17, Comore Loma, Division No. 9, Bonneville County, Idaho that is S.0°05'00"E. 9.86 feet along the section line from the East 1/4 Corner of Section 12, Township 1 North, Range 38 East of the Boise Meridian; running thence S.0°05'00"E. 1309.23 feet to the Northeast Corner of the Southeast 1/4 of the Southeast 1/4 (SE1/4 SE1/4) of said Section 12; thence N.89°51'01"W. 661.64 feet along the North line of said Southeast 1/4 of the Southeast 1/4 to the Southeast Corner of Lot 9, Block 25, Division No. 11 of said Comore Loma; thence along the Easterly boundary of said Division No. 11, the following five (5) courses: N.0°10'00"E. 358.59 feet; thence N.89°50'00"W. 25.67 feet; thence N.1°00'00"W. 500.00 feet; thence N.56°00'20"W. 463.46 feet; thence N.16°55'42"E. 416.18 feet to the Northeast Corner of Lot 2, Block 13, Division NO. 9 of said Comore Loma; thence S.77°42'25"E. 978.59 feet along the Southerly boundary of Division No. 9 to the POINT OF BEGINNING.

CONTAINING: 25.65 acres.

Division 16 Boundary Description

BOUNDARY DESCRIPTION

Beginning at the Monumented West 1/4 Corner of Section 7, Township 1 North, Range 39 East of the Boise Meridian, said point being on the East boundary of Lot 5, Block 17, Comore Loma, Division No. 15, Bonneville County, Idaho; running thence N.0°05'00"W. 74.10 feet along the section line to the Southerly boundary of Lot 6, Block 17, Division No. 9 of said Comore Loma; thence S.77°37'25"E. 19.15 feet to the Southeast Corner of said Lot 6; thence along the Easterly boundary of Division No. 9, the following eight (8) courses: N.12°19'02"E. 298.04 feet; thence N.18°02'32"E. 619.23 feet; thence N.8°16'22"E. 338.62 feet; thence N.9°01'01"W. 387.12 feet; thence N.4°38'28"W. 286.27 feet; thence N.61°21'32"W. 208.94 feet; thence N.55°04'46"W. 230.31 feet; thence N.5°31'47"W. 314.85 feet; thence leaving said Division 9 boundary, S.59°26'33"E. 111.72 feet; thence S.87°07'50"E. 219.58 feet; thence N.61°22'30"E. 104.58 feet; thence S.67°36'02"E. 173.18 feet; thence N.83°41'03"E. 99.81 feet; thence N.71°58'17"E. 220.01 feet; thence S.49°21'16"E. 487.18 feet; thence S.10°29'16"W. 1066.18 feet; thence S.5°19'09"W. 124.77 feet; thence S.16°02'36"W. 332.35 feet; thence S.20°17'15"W. 470.06 feet; thence S.11°52'54"W. 345.43 feet to the South line of the Northwest 1/4 of said Section 7; thence S.89°51'56"W. 577.82 feet along said South line to the POINT OF BEGINNING.

CONTAINING: 39.90 acres.

Division 17 Boundary Description

BOUNDARY DESCRIPTION

Beginning at the Southwest corner of Lot 9, Block 23, Comore Loma, Division No. 12, Bonneville County, Idaho, said POINT OF BEGINNING bears N.89°52'23"E. along the Section line 1182.31 feet and S.00°07'37"E. 1593.16 feet from the North 1/4 Corner of Section 6, Township 1 North, Range 39 East of the Boise Meridian; running thence S.80°46'24"E. along the South line of said Lot 9 a distance of 376.60 feet; thence S.05°42'30"W. 470.00 feet; thence S.18°48'37"W. 174.71 feet; thence S.70°11'37"W. 223.64 feet; thence N.48°06'28"W. 397.94 feet to a point of curve with a radius of 1273.00 feet and chord that bears N.45°29'00"W. 116.58 feet; thence to the right along said curve 116.62 feet through a central angle of 05°14'56" to the most Southerly corner of Lot 1, Block 24, Comore Loma, Division No. 10, Bonneville County, Idaho; thence N.37°17'05'E. along the Easterly line of said Lot 10 a distance of 530.10 feet to the POINT OF BEGINNING. Containing 8.04 acres.

Division 18 Boundary Description

BOUNDARY DESCRIPTION

Beginning at the Southwest corner of Lot 9, Block 23, Comore Loma, Division No. 12, Bonneville County, Idaho, said POINT OF BEGINNING bears N.89°52'23"E. along the Section line 1182.31 feet and S.00°07'37"E. 1593.16 feet from the North 1/4 Corner of Section 6, Township 1 North, Range 39 East of the Boise Meridian; running thence S.80°46'24"E. along the South line of said Lot 9 a distance of 376.60 feet; thence S.05°42'30"W. 470.00 feet; thence S.18°48'37"W. 174.71 feet; thence S.70°11'37"W. 223.64 feet; thence N.48°06'28"W. 397.94 feet to a point of curve with a radius of 1273.00 feet and chord that bears N.45°29'00"W. 116.58 feet; thence to the right along said curve 116.62 feet through a central angle of 05°14'56" to the most Southerly corner of Lot 1, Block 24, Comore Loma, Division No. 10, Bonneville County, Idaho; thence N.37°17'05'E. along the Easterly line of said Lot 10 a distance of 530.10 feet to the POINT OF BEGINNING. Containing 8.04 acres.

Division 19 Boundary Description

BOUNDARY DESCRIPTION

Beginning at a point that is N.0°05'00"W. 2009.80 feet along the Section line and N.55°04'46"W. 158.94 feet from the East 1/4
Corner of Section 12, Township 1 North, Range 38 East of the Boise Meridian; said point being the Northeast Corner of Lot 5,
Block 16, Comore Loma, Division No. 9, Bonneville County, Idaho; running thence N.67°10'10"W. 380.00 feet to an angle point in
the Northerly line of said Lot 5; thence N.4°40'10"W. 290.00 feet to the Northeast Corner of Lot 6 of said Block 16 being on the
Southerly right-of-way line of 65th South; thence N.86°05'54"E. 80.00 feet along said right-of-way; thence N.3°54'06"W. 60.00
feet to the Northerly right-of-way of said 65th South; thence N.48°54'06"W. 28.28 feet to the Easterly right-of-way line of Redside
Drive; thence along said Redside Drive, the following five (5) courses; N.3°54'06"W. 38.57 feet to a point of curve having a radius of
125.25 feet and a 92.83 foot long chord bearing N.25°39'06"W.; thence to the left along said curve 95.09 feet through a central
angle of 43°30'00" to a point of reverse curve having a radius of 131.29 feet and a 214.05 foot long chord bearing N.7°12'11"E.;
thence to the right along said curve 250.25 feet through a central angle of 109°12'34"; thence N.61°48'27"E. 90.00 feet to a
point of curve having a radius of 268.48 feet and a 293.90 foot long chord bearing N.28°37'23"E.; thence to the left along said
curve 311.00 feet through a central angle of 66°22'09" to the Northwest Corner of Lot 2, Block 15, Division No. 9 of Comore Loma;
thence S.88°52'24"E. along the North line of said lot extended a distance of 303.28 feet; thence N.5°35'40"E. 392.83 feet; thence
S.89°50'48"E. 297.51 feet; thence S.62°35'52"E. 148.37 feet; thence S.58°45'55"E. 174.66 feet; thence N.87°47'06"E.
59.75 feet; thence N.2°57'47"E. 74.40 feet; thence N.47°44'47"E. 137.38 feet; thence S.37°34'15"E. 167.96 feet; thence
S.72°46'44"E. 184.67 feet; thence S.88°13'41"E. 91.63 feet; thence N.66°15'09"E. 129.50 feet; thence S.42°59'47"E.
85.47 feet; thence S.28°22'10"E. 708.00 feet thence S.39°00'57"W. 32.84 feet; thence S.61°20'50"W. 433.17 feet; thence
S.9°51'44"W. 277.20 feet; thence S.35°23'32"W. 183.79 feet; thence S.46°51'59"W. 114.87 feet to the Northeast Corner of
Lot 15, Block 17, Division No. 16 of Comore Loma; thence along the Northerly boundary of said Division No. 16 the following seven
(7) courses: N.49°21'16"W. 487.17 feet; thence S.71°58'17"W. 220.01 feet; thence S.83°41'03"W. 99.81 feet; thence
N.67°36'02"W. 173.18 feet; thence S.61°22'30"W. 104.58 feet; thence N.87°07'50"W. 219.58 feet; thence N.59°26'33"W.
111.72 feet to an angle point in the Easterly boundary of Lot 7, Block 16, Division No. 9 of Comore Loma; thence S.5°31'47"E.
314.85 feet to the POINT OF BEGINNING.

CONTAINING: 52.04 acres.

Division 20 Boundary Description

BOUNDARY DESCRIPTION

Beginning at a point that is S.1°03'32"W. 1375.77 feet along the section line from the Northwest Corner of Section 6, Township 1 North, Range 39 East of the Boise Meridian; said point being the most Southerly Corner of Lot 1, Block 20, Comore Loma, Division No. 10, Bonneville County, Idaho; running thence N.67°57'38"E. 579.59 feet to an angle point in the Southerly line of said Lot 20; thence N.42°16'53"E. 180.00 feet along said lot line to the most Westerly Corner of Lot 6, Block 20, Division No. 14 of said Comore Loma; thence along said Division No. 14 boundary, the following ten (10) courses: S.46°51'29"E. 158.84 feet; thence S.13°10'41"W. 408.92 feet; thence S.10°10'00"E. 380.00 feet; thence S.63°57'55"W. 80.00 feet; thence S.1°08'00"E. 250.00 feet; thence N.74°22'07"W. 230.00 feet; thence N.78°10'49"W. 260.13 feet to a point on a curve having a radius of 245.53 feet and a 62.80 foot long chord bearing S.69°45'43"W.; thence Southwesterly along said curve to the right 62.97 feet, through a central angle of 14°41'39"; thence S.77°06'33"W. 117.12 feet; thence S.0°16'18"W. 766.29 feet to the Southwest Corner of said Division No. 14; thence N.57°52'55"W. 55.57 feet to a point of curve having a radius of 539.65 feet and a 372.40 foot long chord bearing N.78°03'57"W.; thence crossing into the Southeast 1/4 of Section 1, Township 1 North, Range 38 East of the Boise Meridian, along said curve to the left 380.22 feet, through a central angle of 40°22'05"; thence S.81°45'00'W. 91.15 feet to the most Easterly Corner of Lot 14, Block 3, Division No. 7 of said Comore Loma; thence N.38°00'00"W. 655.00 feet to the most Southerly Corner of Lot 6, Block 3, Division No. 1 of said Comore Loma; thence N.50°52'04"E. 1125.42 feet along said Division No. 1 boundary to the East line of Section 1, Township 1 North, Range 38 East of the Boise Meridian; thence N.1°03'32"E. 194.23 feet along said Section line to the POINT OF BEGINNING.
CONTAINING: 30.541 acres.

Division 21 Boundary Description

BOUNDARY DESCRIPTION

Beginning at the Monumented Southwest Corner of Section 6, Township 1 North, Range 39 East of the Boise Meridian; running thence N.0°05'00"W. 85.42 feet along the section line to the Southeast Corner of Section 1, Township 1 North, Range 38 East of the Boise Meridian; thence N.1°03'36"E. 895.29 feet along the section line; thence S.88°56'24"E. 1313.24 feet to the TRUE POINT OF BEGINNING; said point being the most Northerly Corner of Lot 14, Block 18, Comore Loma, Division No. 19, Bonneville County, Idaho; running thence N.27°07'00"E. 150.00 feet; thence S.84°09'17"E. 248.01 feet; thence S.85°31'19"E. 333.18 feet; thence S.4°28'41"W. 260.61 feet; thence S.49°28'41"W. 28.28 feet; thence N.85°31'19"W. 60.00 feet; thence S.4°28'41"W. 60.00 feet; thence S.0°25'13"E. 351.29 feet; thence N.85°31'19"W. 30.00 feet; thence S.54°17'16"W. 146.41 feet to the Southeast Corner of Lot 2, Block 18, Comore Loma, Division No. 19, Bonneville County, Idaho; thence along the Easterly boundary of said Division No. 19, the following two (2) courses: N.28°22'10"W. 708.00 feet; thence N.42°59'47"W. 85.47 feet to the TRUE POINT OF BEGINNING.
CONTAINING: 6.99 acres.

Division 22 Boundary Description

BOUNDARY DESCRIPTION

Beginning at the Southwest Corner of Section 6, Township 1 North, Range 39 East of the Boise Meridian; running thence N.0°05'00"W. 85.42 feet along the Section line to the Southeast Corner of Section 1, Township 1 North, Range 38 East of the Boise Meridian; thence N.1°03'36"E. 989.49 feet along the section line; thence S.88°56'24"E. 1958.87 feet to the TRUE POINT OF BEGINNING; said point being the Northeast Corner of Lot 17, Block 15, Comore Loma, Division No. 21, Bonneville County, Idaho; running thence S.85°31'19"E. 60.00 feet; thence N.4°28'41"E. 19.39 feet; thence S.85°31'19"E. 250.00 feet; thence N.82°01'24"E. 256.03 feet; thence N.84°09'34"E. 175.56 feet; thence N.59°55'11"E. 179.32 feet; thence N.47°01'04"E. 245.99 feet; thence N.39°59'17"E. 257.51 feet; thence N.56°13'18"E. 381.82 feet; thence N.67°30'37"E. 60.00 feet to a point on a non-tangent curve having a radius of 380.00 feet and a 97.63 foot long chord bearing S.15°06'32"E.; thence Southerly along said curve to the right 97.91 feet through a central angle of 14°45'43"; thence N.88°48'42"E. 323.94 feet; thence S.14°03'51"W. 350.59 feet to a point on a non-tangent curve having a radius of 480.00 feet and an 82.25 foot long chord bearing S.65°18'29"E.; thence Southeasterly along said curve to the right 82.35 feet through a central angle of 9°49'48"; thence S.44°30'38"W. 316.08 feet; thence S.38°41'03"E. 102.95 feet; thence S.32°18'27"W. 1260.84 feet; thence S.0°43'18"W. 171.21 feet; thence S.12°19'24"E. 478.28 feet; thence S.25°43'39"W. 401.45 feet; thence S.42°03'49"W. 719.88 feet; thence S.57°25'36"W. 507.33 feet; thence S.49°38'50"W. 105.36 feet; thence N.89°32'24"W. 113.87 feet; thence N.31°04'20"W. 151.93 feet; thence N.3°23'53"E. 280.74 feet; thence N.70°48'21"W. 473.14 feet; thence N.79°01'08"W. 482.79 feet to the Southeast Corner of Lot 13, Block 17, Division No. 16 of said Comore Loma; thence N.10°29'16"E. 823.22 feet to the Northwest Corner of Lot 15, Block 17 of said Division No. 16; said point being the most Southerly Corner of Lot 16, Block 17, Division No. 19 of said Comore Loma; thence along said Division No. 19 boundary, the following five (5) courses: N.46°51'59"E. 114.87 feet; thence N.35°23'32"E. 183.79 feet; thence N.9°51'44"E. 277.20 feet; thence N.61°20'50"E. 433.17 feet; thence N.39°00'57"E. 32.84 feet to the most Southerly Corner of Lot 3, Block 18, Division No. 21 of said Comore Loma; thence along said Division No. 21 boundary, the following four (4) courses: N.54°17'16"E. 146.41 feet; thence S.85°31'19"E. 30.00 feet; thence N.0°25'13"W. 351.29 feet; thence N.4°28'41"E. 60.00 feet to the South line of the aforementioned Lot 17, Block 15; thence along said Lot 17 boundary, the following three (3) courses: S.85°31'19"E. 60.00 feet; thence N.49°28'41"E. 28.28 feet; thence N.4°28'41"E. 260.61 feet to the TRUE POINT OF BEGINNING.

CONTAINING: 121.931 acres.

Division 23 Boundary Description

BOUNDARY DESCRIPTION

Beginning at a point that is S.1°03'36"W. 2105.45 feet along the section line and S.88°56'24"E. 3544.55 feet from the Northwest Corner of Section 6, Township 1 North, Range 39 East of the Boise Meridian; said point being the most Westerly corner of Lot 3, Block 24, Comore Loma, Division No. 18, Bonneville County, Idaho; running thence along said Division No. 18 boundary the following two (2) courses: S.48°06'28"E. 275.00 feet; thence N.70°11'37"E. 223.64 feet; thence N.73°22'20"E. 385.51 feet; thence S.86°10'16"E. 85.11 feet; thence S.26°20'34"E. 99.90 feet; thence S.7°15'41"E. 143.01 feet; thence S.16°52'53"W. 71.58 feet; thence S.6°46'45"E. 192.54 feet; thence S.8°29'37"E. 357.96 feet; thence S.27°56'06"E. 263.85 feet; thence S.34°55'33"E. 201.68 feet; thence S.61°55'05"E. 284.86 feet; thence S.47°01'11"E. 250.00 feet; thence S.42°58'49"W. 410.00 feet; thence N.47°01'11"W. 67.49 feet; thence S.42°58'49"W. 379.39 feet; thence S.46°53'28"E. 74.62 feet; thence S.42°32'30"W. 406.15 feet; thence S.47°27.27"E. 22.33 feet; thence S.42°32'33"W. 371.84 feet; thence N.47°27'27"W. 315.33 feet; thence N.42°32'33"E. 88.45 feet; thence N.47°31'00"W. 375.52 feet to the most Easterly Corner of Lot 22, Block 18, Division No. 22 of said Comore Loma; thence along said Division No. 22 boundary the following four (4) courses: N.38°41'03"W. 102.95 feet; thence N.44°30'38"E. 316.08 feet to a point on a curve having a radius of 480.00 feet and an 82.25 foot long chord bearing N.65°18'30"W.; thence Northwesterly along said curve to the left 82.35 feet through a central angle of 9°49'48"; thence N.14°03'51"E. 350.59 feet; thence S.78°12'01"E. 171.04 feet; thence N.16°57'58"W. 100.83 feet; thence N.31°04'49"W. 160.68 feet; thence N.24°22'32"W. 53.68 feet; thence N.28°51'48"W. 153.09 feet; thence N.41°23'35"W. 78.70 feet; thence N.44°59'23"W. 153.56 feet; thence N.25°58'15"W. 108.83 feet; thence N.6°37'14"W. 134.32 feet; thence N.29°21'05"W. 97.95 feet; thence N.55°33'30"W. 131.80 feet to the Southeast Corner of Lot 4, Block 21, Division No. 10 of said Comore Loma; thence N.4°59'47"E. 526.36 feet to the Northeast Corner of said Lot 10; thence N.41°53'32"E. 60.00 feet to the POINT OF BEGINNING.

CONTAINING: 53.843 acres.

Division 24 Boundary Description

BOUNDARY DESCRIPTION

Beginning at a point that is S.1°03'36"W. 1763.26 feet along the section line and S.88°56'24"E. 2334.86 feet from the Northwest Corner of Section 6, Township 1 North, Range 39 East of the Boise Meridian; said point being the most Westerly Corner of Lot 2, Block 21, Comore Loma, Division No. 10, Bonneville County, Idaho; running thence along said Division 10 boundary, the following ten (10) courses: S.59°10'03"E. 130.22 feet; thence S.4°17'21"E. 281.55 feet; thence S.49°31'45"E. 122.21 feet; thence S.33°27'03"E. 225.51 feet; thence S.27°13'37"E. 212.46 feet; thence S.21°36'39"E. 220.97 feet; thence N.48°15'35"E. 245.82 feet; thence S.58°01'18"E. 186.96 feet; thence S.80°29'15"E. 122.25 feet; thence N.76°00'14"E. 129.77 feet to the most Westerly corner of Lot 5, Block 21, Division No. 23 of said Comore Loma; thence along said Division 23 boundary, the following eleven (11) courses: S.55°33'30"E. 131.80 feet; thence S.29°21'05"E. 97.95 feet; thence S.6°37'14"E. 134.32 feet; thence S.25°58'15"E. 108.83 feet; thence S.44°59'23"E. 153.56 feet; thence S.41°23'35"E. 78.70 feet; thence S.28°51'48"E. 153.09 feet; thence S.24°22'32"E. 53.68 feet; thence S.31°04'49"E. 160.68 feet; thence S.16°57'58"E. 100.83 feet; thence N.78°12'01"W. 171.04 feet to the Northeast Corner of Lot 1, Block 29, Division No. 22 of said Comore Loma; thence along said Division 22 boundary, the following twelve (12) courses: S.88°48'42"W. 323.94 feet to a point on a non-tangent curve having a radius of 380.00 feet and a 97.63 foot long chord bearing N.15°06'32"W.; thence Northerly along said curve to the left 97.91 feet through a central angle of 14°45'43"; thence S.67°30'37"W. radial to said curve 60.00 feet; thence S.56°13'18"W. 381.82 feet; thence S.39°59'17"W. 257.51 feet; thence S.47°01'04"W.245.99 feet; thence S.59°55'11"W. 179.32 feet; thence S.84°09'34"W. 175.56 feet; thence S.82°01'24"W. 256.03 feet; thence N.85°31'19"W. 250.00 feet; thence S.4°28'41"W. 19.39 feet; thence N.85°31'19"W. 393.18 feet to the Northwest Corner of Lot 17, Block 15, Division No. 21 of said Comore Loma; thence N.84°09'17"W. 248.01 feet to the Northwest Corner of Lot 16, Block 15 of said Division No. 21; thence N.4°43'15"E. 191.26 feet; thence N.19°04'10"E. 289.19 feet; thence N.0°48'00"W. 173.93 feet to an angle point in the Southerly boundary of Lot 31, Block 25, Division No. 14 of said Comore Loma; thence along said Division 14 boundary, the following seven (7) courses: N.81°56'01"E. 269.17 feet; thence N.46°40'29"E. 218.82 feet; thence N.15°04'23"W. 495.40 feet; thence N.70°33'30"E. 90.00 feet; thence N.13°11'29"E. 279.59 feet; thence N.12°20'00"W. 400.00 feet; thence N.54°38'42"W. 70.00 feet to the most Southerly Corner of Lot 26, Block 21, the Second Amended Plat of Division No. 10 of said Comore Loma; thence along said Second Amended Plat boundary, the following two (2) courses: N.38 °42'57"E. 253.71 feet; thence N.30°49'57"E. 184.93 feet to the POINT OF BEGINNING.

CONTAINING: 68.703 acres.

Division 25 Boundary Description

BOUNDARY DESCRIPTION

Beginning at a point that is N.89°53'00"E. 146.37 feet along the section line from the Northwest Corner of Section 5, Township 1 North, Range 39 East of the Boise Meridian; running thence N.89°53'00"E. 163.42 feet along said section line; thence S.20°23'39"E. 227.39 feet; thence S.9°26'00"W. 243.41 feet; thence S.18°44'35"E. 205.62 feet; thence S.83°27'37"E. 104.53 feet; thence N.65°48'45"E. 207.41 feet; thence S.16°09'10"E. 268.19 feet; thence S.5°51'22"E. 416.87 feet; thence S.30°44'14"E. 198.08 feet; thence S.17°26'53"E. 198.10 feet; thence S.27°44'41"E. 177.18 feet; thence S.37°10'07"E. 219.71 feet; thence S.7°58'50"E. 200.00 feet; thence S.3°30'26"W. 301.33 feet; thence S.13°13'19"E. 225.13 feet; thence S.33°09'50"E. 173.58 feet; thence S.62°32'28"E. 375.30 feet; thence S.59°18'26"E. 220.51 feet; thence S.45°26'32"E. 414.05 feet; thence S.40°55'10"E. 185.61 feet; thence S.32°39'41"E. 300.62 feet; thence S.62°47'02"E. 172.79 feet; thence S.1°02'11"E. 260.00 feet; thence S.23°08'11"W. 610.00 feet; thence N.74°45'58"W. 561.07 feet; thence N.85°16'53"W. 355.50 feet; thence S.70°31'33"W. 520.36 feet; thence S.76°17'46"W. 406.87 feet; thence N.86°30'08"W. 399.62 feet; thence N.60°33'40"W. 395.06 feet crossing into Section 6 of Township 1 North, Range 39 East of the Boise Meridian; thence N.46°56'00"W. 65.58 feet; thence S.42°30'01"W. 403.48 feet; thence S.47°29'59"E. 22.33 feet; thence S.42°30'01"W. 371.84 feet; thence N.47°29'59"W. 186.85 feet; thence S.34°00'04"W. 436.89 feet; thence S.16°12'55"W. 232.47 feet crossing into Section 6 of Township 1 North, Range 39 East of the Boise Meridian; thence S.0°56'20"W. 532.40 feet; thence S.14°26'35"W. 285.46 feet; thence N.75°56'24"W. 333.85 feet; thence S.14°03'40"W. 72.04 feet; thence N.75°56'20"W. 60.00 feet; thence N.60°23'59"W. 375.73 feet to the Easterly boundary of Lot 15, Block 18, Comore Loma, Division No. 22, Bonneville County, Idaho; thence Northerly along said Easterly boundary, the following four (4) courses: N.25°41'07"E. 73.19 feet; thence N.12°21'56"W. 478.28 feet; thence N.0°40'46"E. 171.21 feet; thence N.32°15'55"E. 1260.84 feet crossing into Section 6 of Township 1 North, Range 39 East of the Boise Meridian to the most Easterly Corner of Lot 22 of said Block 18, being also an angle point in the Southwesterly boundary of Lot 24, Block 18, Division No. 23 of said Comore Loma; thence along said Division No. 23 boundary, the following twenty one (21) courses: S.47°33'32"E. 375.52 feet; thence S.42°30'01"W. 88.46 feet; thence S.47°29'59"E. 315.33 feet; thence N.42°30'01"E. 371.84 feet; thence N.47°29'59"W. 22.33 feet; thence N.42°30'01"E. 406.15 feet; thence N.46°56'00"W. 74.62 feet; thence N.42°56'17"E. 379.39 feet; thence S.47°03'43"E. 67.49 feet; thence N.42°56'17"E. 410.00 feet; thence N.47°03'43"W. 250.00 feet; thence N.61°57'37"W. 284.86 feet; thence N.34°58'05"W. 201.68 feet; thence N.27°58'38"W. 263.85 feet; thence N.8°32'09"W. 357.96 feet; thence N.6°49'17"W. 192.54 feet; thence N.16°50'21"E. 71.58 feet; thence N.7°18'13"W. 143.01 feet; thence N.26°23'06"W. 99.90 feet; thence N.86°12'48"W. 85.11 feet; thence S.73°19'48"W 385.51 feet to the Southeast Corner of Lot 3, Block 24, Division No. 18 of said Comore Loma; thence along the Easterly boundary of Divisions 18 and 12 of said Comore Loma the following two (2) courses: N.18°46'05"E. 174.71 feet; thence N.5°39'58"E. 863.46 feet to the most Easterly Corner of Lot 9, Block 23 of said Comore Loma, Division No. 12; thence S.41°57'51"E. 36.59 feet; thence S.43°19'45"E. 124.47 feet; thence N.89°31'51"E. 267.10 feet; thence N.21°37'36"E. 318.62 feet; thence N.43°30'45"E. 309.21 feet; thence N.27°50'48"E. 369.68 feet; thence N.45°30'46"E. 250.07 feet crossing into Section 5 of Township 1 North, Range 39 East of the Boise Meridian; thence N.8°14'38"E. 362.95 feet to the POINT OF BEGINNING.

CONTAINING: 233.023 acres.

COMORE LOMA WATER CORPORATION

BYLAWS

ARTICLE I

MEETING OF MEMBERS

1. Annual Meeting. The annual meeting of members shall be held at the principal office of corporation, in Bonneville County, Idaho, on the fourth Tuesday of April of each year at 7:00 p.m. The Secretary shall serve personally, or by mail, a written notice thereof, addressed to each member at his address as it appears on the membership roster, at least ten (10) days, but no more than fifty (50) days, prior to the date of such meeting, but at any meeting at which all members shall be present, or of which all members not present have waived notice in writing, the giving of notice as above required may be dispensed with.

2. Quorum. The presence, in person or proxy, of the members owning one-tenth of the lots then actually being serviced by the corporation shall be the necessary to constitute a quorum for the transaction of business, but a lesser number may adjourn to some future time not less than four (4) nor more than ten (10) days later, and the Secretary shall thereupon give at least (3) days notice by mail to each entitled to vote who was absent from such meeting.

3. Special Meetings. Special meetings of the members may be called at any time by a majority of the directors or by the President. Notice of such meeting stating the purpose for which it is called shall be served personally or by mail, not less than ten (10) nor more than fifty (50) days before the date set for such meeting. If mailed, it shall be directed to a member at his address as it appears on the membership roster; but at any meeting at which all members shall be present, or of which all members not present have waived notice in writing, the giving of notice as above described may be dispensed with. The Board of Directors shall also, in like manner, call a special meeting of members whenever so requested in writing by members owning not less than one-tenth (1/10) of the lots actually being serviced by the company. No business other than that specified in the call for meeting for the meeting shall be transacted at any meeting of the members.

4. Voting. At all meetings of the members all questions, the manner of deciding which is not specifically otherwise regulated by statute, shall be determined by an affirmative vote of the owners of a majority of the lots represented at the meeting either in person or by proxy entitled to vote on an issue under and pursuant to the Articles of Incorporation. Each member present, in person or by proxy, shall be entitled to cast one vote for each lot entitled to a vote owned or represented by him. All voting shall be *viva voce*, except that any qualified voter may demand that the vote shall be by ballot, each of which shall state the name of the member voting and the number of lots owned by him, and in addition, if such ballot be cast by proxy; the name of the proxy shall be stated. The casting of all votes at special meetings of members shall be governed by the provisions of the corporation laws of the State of Idaho.

5. Order of Business. The order of business at all meetings of the members shall be as follows:

a. Roll call.

b. Proof of notice of meeting or waver of notice.

c. Reading of minutes of preceding meeting.

d. Report of officers.

e. Report of committees.

f. Election of inspection of elections.

g. Election of directors.

h. Unfinished business.

i. New business.

ARTICLE II

DIRECTORS

1. Numbers. The affairs and business of this corporation shall be managed and controlled by a Board of Directors consisting of not less than three (3) nor more than (7) persons. All Board members shall be over 18 years of age, members of record, and one of which shall also be President of this corporation.

2. How Elected. At the annual meeting of members, the three (3) persons receiving the highest number of votes cast, shall be directors and shall constitute a Board of Directors for the ensuing year.

3. Term of Office. The term of office of each of the directors shall be one (1) year, and thereafter until his successor has been elected.

4. Duties of Directors. The Board of Directors shall have the control and general management of the affairs and business of the corporation. Such directors shall in all cases act as a Board, regularly convened, by a majority, and they may adopt such rules and regulations for the conduct of their meetings and the management of the corporation, as they may deem proper, not inconsistent with these Bylaws or the laws of the State of Idaho.

5. Directors' Meeting. Regular meetings of the Board of Directors shall be held immediately following the annual meeting of the members, and at such other times as the Board of Directors may determine. Special meetings of the Board of Directors may be called by the President at any time, and shall be called by the President or the Secretary upon written request of one (1) director.

6. Notice of Meeting. Notice of meetings, other than the regular annual meetings, shall be given by service upon each director, in person, or by mailing to him at his last known post office address, at least 24 hours before such meeting, a written or printed notice thereof specifying the time and place of such meeting, and the business to be brought before the meeting and no business other than that specified in such notice shall be transacted at any special meeting. At any meeting at which every member of the Board of Directors shall be present, although held without notice, any business may be transacted which might have been transacted if the meeting had been duly called.

7. Quorum. At any meeting of the Board of Directors, two (2) of the Board shall constitute a quorum for the transaction of business; but in the event of a quorum not being present, a less number may adjourn the meeting to some future time, not more than five (5) days later.

8. **Voting.** At all meetings of the Board of Directors, each director is to have one (1) vote, irrespective of the number of lots that he may own.

9. **Vacancies.** Vacancies in the Board occurring between annual meetings shall be filed for the unexpired portion of the term by a vote of the majority of the remaining directors; but nothing herein contained shall deprive the members of the right to remove, replace, or fill the vacancies of any directors should the directors fail, or become unable to do the same.

10. **Removal of Directors.** Any one or more of the directors may be removed either with or without cause, at any time by a vote of the members owning more than two-thirds (2/3) of the total number of members at any special meeting called expressly for that purpose.

11. **Compensation of Directors.** Directors, as such, shall not receive any stated salary for their services, but, by resolution of the Board a fixed sum, and expenses of attendance, if any, may be allowed to directors for attendance at each regular or special meeting of the Board of Directors, or of any committee thereof, but nothing herein contained shall be construed to preclude any director from serving the corporation in any other capacity and receiving compensation therefore.

12. **Indemnification of Directors.** The corporation shall indemnify and hold harmless any and all of its directors, officers, former directors and officers, and any person who may have served at its request as a director or officer of another corporation, in which it owns any shares of capital stock or of which it is a creditor, against any and all claims, demands, liabilities, actions, suits or proceedings and all obligations for damages or other judgments or other obligations arising there from, together with cost and attorney's fees incurred in defending against the same, actually and necessarily arising against them or incurred by them in connection with or by reason of their being or having been directors or officers or a director or officer, of this or such other corporation, excepting only in relation to such matters as to which any such director, officer, former director or officer, or person shall be adjudged in such action, suit or proceeding to be liable for gross negligence or willful misconduct in the performance of duty. Such indemnification shall not be deemed exclusive of any other right to which those indemnified may be entitled under any bylaw, agreement, vote of stockholders or otherwise.

13. Action Without A Meeting. If all the directors severally or collectively consent in writing to any action or to be taken by the corporation and the writing or writings evidencing their consent are filed with the secretary of the corporation, the action shall be valid as though it had been authorized by a unanimous vote at a properly constituted meeting of the Board.

ARTICLE III

OFFICERS

1. Numbers. The officers of this corporation shall be the President, one or more Vice Presidents, as determined by the Board of Directors, Secretary, and Treasure. Two or more offices may be held by the same person, except that one person shall not at the time hold the offices of the president and secretary.

2. Election. All officers of the company shall be elected annually by the Board of Directors at its meeting held immediately after the meeting of the members, and shall hold office for the term of one (1) year or until their successors are duly elected.

3. Duties of Officers. The duties and powers of the officers of the company shall be as follows:

a. *President*. The President shall: (i) be a member of the Board of Directors of the corporation and shall preside at all meetings of the Board of Directors and members; (ii) present at each annual meeting of the members and directors a report of the condition of the business of the company; (iii) cause to be called regular and special meetings of the members and directors in accordance with these Bylaws; (iv) appoint and remove, employ and discharge, and fix the compensation of all servants, agents, employees and clerks of the corporation other than the duly appointed officers, subject to the approval of the Board of Directors; (v) sign and make all contracts and agreements in the name of the corporation; (vi) see that the books, reports, statements required by the statutes are properly kept, made and filed according to law; (vii) sign all notes, drafts, or bills of exchange, warrants or other orders for the payment of money duly drawn by the Treasure; and (viii) enforce these Bylaws and perform all the duties incident to the position and office, and which are required by law.

b. *Vice President*. During the absence and inability of the President to render and perform his duties or exercise his powers, as set forth in these Bylaws or in the acts under which this corporation is organized, the same shall be performed and exercised by the Vice President. When so acting, the Vice President shall have all the powers and be subject to all the responsibilities hereby given to or imposed upon the President. The Vice President shall also perform all other responsibilities delegated by the President or the Board of Directors.

c. *Secretary*. The Secretary shall: (i) keep the minutes of the meetings of the Board of Directors and of the members in appropriate books; (ii) give and serve all notices of the corporation; (iii) be custodian of the records and of the seal, and affix the latter when required; (iv) keep the books in the manner prescribed by law, so as to show at all times the number of memberships, the names of the members, alphabetically arranged, their respective place of residence, their post office address, the number of lots owned by each, and the time at which each person became a member; (v) keep such books open daily during business hours at the office of the corporation, and permit members to make extracts from said books to the extent and as prescribed by law; (vi) present to the Board of Directors at their stated meetings all communications address to him officially by the President or any officer or member of the corporation; and (vii) attend to all correspondence and perform all the duties incident to the office of Secretary.

d. *Treasurer*. The Treasurer shall: (i) have the care and custody of and be responsible for all the funds and securities of the corporation; (ii) deposit all such funds and securities of the corporation, in the name of the corporation in such bank or banks, trust company or trust companies or safe deposit vaults as the Board of Directors may designate; (iii) exhibit at all reasonable times his books and accounts to any director or member of the company upon application at the office of the corporation during business hours; (iv) render a statement of the condition of the finances of the corporation at each regular meeting of the Board of Directors, and at such other times as shall be required of him, and a full financial report at the annual meeting of the members; (v) keep at the office of the corporation, correct books of account of all its business and transactions and such other books of account as the Board of Directors may require; and (vi) do and perform all duties pertaining to the office of the Treasure.

4. Bond. All personal of the company or any member thereof, if required by the Board of Directors, shall give to the company such security for the faithful discharge of his or their duties as the Board may direct.

5. Filling Vacancies. All vacancies in any office , shall be filled by the Board of Directors without undue delay, at its regular meeting, or at a meeting specially called for that purpose.

6. Compensation of Officers. The officers shall receive such salary or compensation as may be determined by the Board of Directors.

7. Removal. The Board of Directors may remove any officer, by a majority vote, at any time with or without cause.

8. Delegation of Duties. Whenever an officer is absent or whenever for any reason the Board of Directors may deem it desirable, the Board may delegate the powers and duties of any officer to any other officer, officers, director or directors.

ARTICLE IV

SEAL AND FISCAL YEAR

1. Seal. The seal of the corporation shall be as follows;

(Seal at corporate office.)

2. Fiscal Year. The fiscal year of this corporation shall begin January 1 and end December 31.

ARTICLE V

MEMBERSHIP

1. Transfer of Membership. Membership in the corporation shall run with the land, and be automatically transferred upon satisfactory proof of transfer of ownership of the land to which it is appurtenant, as provided by Article V, Paragraph 1 of the Restates Articles of Incorporation. No transfer or assignment thereof apart from the ownership of said property shall be valid or binding on the corporation. No transfer shall be made upon the books of the corporation within ten (10) days next preceding the annual meeting of the members.

2. Membership Restrictions for Delinquent Charges or Assessments. The Secretary may refuse to transfer any membership on the records of the corporation at any time that it appears from the corporate records that a charge or assessment levied against and applicable to that has not been paid by or on behalf of the holder thereof, and such members shall not be entitled to vote at any meeting of the members of the corporation until such time as the charges and assessments due and owing are paid.

ARTICLE VI

DIVIDENDS

In order to maintain the non-profit status of this corporation, no dividends may be declared nor distributed from the income of the corporation to its members, except that the corporation may pay compensation in a reasonable amount to its members, directors or officers for services actually rendered, and may confer benefits upon its members in conformity with its purposes.

ARTICLE VII

BILLS, NOTES, ETC.

All bills payable, notes, checks or other negotiable instruments of corporation shall be made in the name of the corporation, and shall be signed by such officers of the corporation as the Board of Directors may direct. No person, without having such authority, shall have the right either singly or jointly with others, to make any bill payable, note, check, draft or warrant or negotiable instrument, or endorse the same in the name of the corporation, or in contract or cause to be contracted any dept or liability in the name or on behalf of the corporation, except as expressly permitted by the Board of Directors.

ARTICLE VIII

WATER RATES, CHARGES AND ASSESSMENTS

1. Water Rates and Charges. The Board of Directors may set rates and charges for the delivery of water to members in order to cover the costs of operating and managing the business of the corporation, including but not limited to items for depreciation and maintenance of the equipment and readiness to deliver water, utility bills, governmental fees, taxes and assessments, funds earmarked for improvements or enlargement of the water system, and overhead. Such rates and charges shall be fixed by equitably prorating the cost of delivering water as set out above, for that year among all members. The Board may, in its discretion estimate the annual cost of delivering water and bill the members monthly, bi-monthly, quarterly, semi-annual or other basis according to the said estimated annual cost. These estimations are subject to revision at any time the Board shall determine that the actual cost are or will be substantially greater or lesser than the estimated figure.

2. Assessment on Members. If, in the discretion of the Board, it is deemed advisable to assess the members in order to meet the needs of the corporation from time to time to provide facilities to furnish adequate water service to its members, the Board shall make such assessment as provided herein and by the laws of the State of Idaho. No such assessment shall be levied while any portion of a previous assessment remains unpaid, unless the corporation has exercised its powers under the law to collect such previous assessment, or unless such collection efforts have been enjoined, or unless the previous assessment has been cancelled and all amounts collected there under returned.

3. Notice of Charges and Assessments. All individual charges and assessments must specify the amount thereof, when, to whom and where payable, and shall be mailed to each member at his last known address at least thirty (30) days before the charge or assessment becomes due and payable.

4. Meter Service. Should the Board of Directors, in its sole discretion , determine that it would be in the best interest of the corporation to have the water and water service of any particular area or dwelling site metered, then the Board may require that a meter be installed to monitor the water service to such area or site, the cost of the same to be borne by the corporation, and the Board may thereupon establish such rates for said service as it in its discretion shall determine to be equitable and in the best interest of the corporation.

5. Water Turns. The Board of Directors, in its sole discretion, may determine water turns or periods of service for irrigation purposes (but not for domestic household purposes) for all users on the water system of the corporation, and may cause notice of such water turns or periods of service to be furnished to those who will be involved; and in the event of any failure of any participant to observe such water turns or periods of service, the corporation may refuse to furnish water to such participant until and unless such water turns and period of service are strictly observed by such participant.

ARTICLE IX

AMENDMENTS

These Bylaws may be altered, amended, repealed or added to by an affirmative vote of the members owning a two-thirds (2/3) majority of the lots represented at any annual meeting or a special meeting called for that purpose, provided that a written notice shall have been sent to each member which notice shall state the alterations, amendments or changes which are proposed to be made in such Bylaws. Only such changes as have been specified in the notice shall be made. The Board of Directors, by a majority of a quorum, shall also have the authority to amend these Bylaws.

ARTICLE X

WAIVER OF NOTICE

Whenever any notice of the time, place, or purpose of any meeting of members, directors or committees as required to be given under the provisions of the statute or under the provisions of the charter or these Bylaws, a waiver thereof, in writing, signed by the person or persons entitled to such notice and filed with the records of the meeting, whether before or after the holding thereof, or actual attendance at the meeting of members in person or by proxy or at the meeting of directors or committees in person, shall be deemed equivalent to giving of such notice to such persons.

ARTICLE XI

OPERATIONS

To properly operate and maintain the water system of the corporation under the laws of the State of Idaho and provide sufficient water for all homeowners the services of a water operator are required. This water operator will have the necessary experience with water systems, valves, piping, pumping equipment, storage tanks, control systems and all other equipment and operating methods necessary to operate a water system. The duties of the water operator are to be knowledgeable of the current working status of the water system of the corporation and perform all necessary duties to maintain this system in good working order. Comore Loma Water Corporation management shall also cooperate in good faith with the water operator in resolving system problems, assist in homeowner notifications, developing system documentation and establishing operation and maintenance schedules and procedures. It is understood that from time to time the water operator will use their own knowledge and experience to determine what actions are required and, by cooperating with the Comore Loma Water Corporation management, further define the duties of a water operator. The water operator shall at all times be considered an independent contractor and not an employee of the Comore Loma Water Corporation. The water operator shall indemnify Comore Loma Water Corporation, and its directors, officers, and employees from and against all liabilities regardless of nature or type arising out of or resulting from water operator’s performance or any negligent or wrongful act or omission of the water operator. An “Agreement of Services” shall be used to further establish the duties, responsibilities and fees between the Comore Loma Water Corporation and the water operator.

ARTICLE XII

AUDITS AND FINANCIAL REQUIREMENTS

An annual audit shall be done of all financial records of the corporation by an independent accounting firm. The latest audit and yearend financial report shall be included with the annual meeting notice. A yearly budget showing the anticipated revenues and expenditures and current cash balance shall be made available at the annual meeting. All long-term debt agreements shall be subject to approval by a majority vote of members owning assessed lots represented at the annual meeting or a special meeting called for that purpose.

I, the undersigned President of Comore Loma Water Corporation, a corporation, do hereby certify that the forgoing Bylaws were adopted on the 25th day of April 2013.

John Buttles

President

(Signature on file)

WATER SYSTEM DEVELOPMENT AGREEMENT

This Agreement is made and entered into this 3rd day of February, 1997, by and between **COMORE LOMA WATER CORPORATION**, an Idaho corporation (hereinafter "Water Corporation"), and **CO-MORE DEVELOPMENT, INC.,** an Idaho corporation (hereinafter "Developer").

WITNESSETH:

Recitals:

A. Developer and its predecessors in interest are the developers of the Comore Loma Subdivision to the County of Bonneville, State of Idaho, which currently consists of six (6) separate divisions, namely nos. 1,2,3,4,5 and 7 (there being no Division 6) containing a total of 138 lots for dwelling sites plus one well lot (hereinafter referred to, along with its planned future divisions, as the "Subdivision").*

B. In connection with such development, Developer's predecessors-in-interest caused the formation of the Water Corporation to provide water to the owners of lots within the Subdivision. The Water Corporation is now owned and controlled by the lot owners, under the direction of a Board of Directors which is independent from and not controlled by Developer, although the Developer does have certain membership rights.

C. Pursuant to previous agreements, offers and modifications thereof between Developer's predecessors and the Water Corporation, Developer and its predecessors have developed, installed, and paid for all existing wells, pumps, water storage tanks, water lines and other facilities associated therewith except 67% of Well No. 4, necessary to produce and deliver water to lots within the Subdivision, have transferred the same to the Water Corporation (except for the storage tank and water lines running to and from the tank). Also pursuant to those agreements, Offers and modifications thereof, as well as the corporate responsibilities incumbent upon it, the Water Corporation installed and paid for 67% of Well No. 4 (All of said water facilities, whether previously installed by Developer and its predecessors or by the Water Corporation, are hereinafter referred to as "the Water System.") The Water Corporation owns and is responsible, at its own expense, to maintain and operate the Water System for the benefit of its members.

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* There are actually 140 platted lots in Division 1 through 7 of the Subdivision. Also included within the term "Subdivision," as herein defined, is one (1) lot owned by Randy Skidmore which is not within any of the platted divisions of the Comore Lome Subdivision but which is hooked up to the Water System, and whose owner is an equal member of the Corporation, making a total of 141 lots. However, there are three lots in Division 1 of the Subdivision which are not, and will not, be hooked up to the water system (namely, Lots 1,2 and 3 of Block 2 thereof), resulting in 138 lots currently in the Subdivision, as defined herein.

D. The Water System has been approved by the State of Idaho, Division of Environmental Quality ("DEQ"), to service up to, but not more than, 142 homes/lots. This approval is based on a required pumping capacity of 10.1 gpm per home, as determined by the DEQ. Currently 104 lots in the Subdivision are actually receiving water service from the Water Corporation, or have homes under construction which will soon receive water service. The Water Corporation desires to maintain a reserve pumping capacity above the minimum per lot capacity determined by the DEQ of 52 homes ("Reserve Pumping Capacity").

E. Developer has completed the final platting for Division 8 of the Subdivision, consisting of an additional 29 building lots. In addition, Developer now owns or has obtained options to purchase up to approximately 3,400 additional acres of property contiguous to the Subdivision, which it may develop over time as part of the Subdivision.

F. The parties desire to redefine their respective rights and obligations with regard to the Water System to accommodate the development of additional divisions to the Subdivision, including the responsibilities for the installation of additional wells, pumps, and other facilities, the payment and security therefor, and the responsibility of the Water Corporation to maintain the water system and to provide water service to the lots so developed.

NOW, THEREFOR, in consideration of the mutual covenants and agreements contained herein, the parties hereto agree as follows:

1. **Developer's Membership Status Within Water Corporation.** Consistent with the Amended and Restated Articles of Incorporation of the Water Corporation, there are a total of 138 lots to which membership in the Water Corporation is appurtenant. Five (5) of such memberships have never been issued (as explained in paragraph 3.d., *infra*), resulting in a total number of issued and outstanding memberships of 133. The parties agree that, as of the date hereof, Developer (or its predecessors) owns a total of 21 lots out of the 133, and the memberships appurtenant thereto.

2. **Rights and Obligations Water Corporation.**

    a. *Ownership of Water System*. It is expressly understood and agreed between the parties that the Water Corporation owns all of the Water System except the storage tank and the water lines to and from the storage tank. Upon execution hereof, Developer will, by due and proper deeds and other instruments, convey to the Water Corporation the storage tank and water lines, but not the underlying real estate, and will also convey to the Water Corporation an easement for access to and maintenance of such tank and lines, across the following described property, to wit:

        That portion of the SE1/4 of Section 1, Township 1 North, Range 38 East of the Boise Meridian, Bonneville County, Idaho, on which is actually located the water storage tank and water lines running to and from said water storage tank. Said water lines and storage tank are generally located along and at the end, respectively, of the extension of Comish Drive as shown on a Preliminary Plat known as "The Water Plan" dated January 1974 by Benton Engineering, Job No. 1244.

b. *Obligation to Maintain the Water System*. It is also expressly understood and agreed that the Water Corporation has the sole and exclusive obligation to operate and maintain the Water System for the benefit of its members. The parties specifically agree that Water Corporation shall maintain the Water System to the extent necessary to maintain the current pumping capacity of 1470 gpm, and as such may be increased by future expansions of the Water System as provided hereafter. In the event the Water Corporation fails to do so, after reasonable notice and opportunity from Developer, Developer may at its option make such repairs and do such maintenance, and shall be entitled to immediate reimbursement for all reasonable cost and expenses incurred therein. PROVIDED, HOWEVER, that the Water Corporation may, at its option, decide to decrease the actual pumping capacity of the Water System at any time by reducing the pumping capacity of one or more pumps, or by abandoning wells or taking them off line, and in the event of its election to do so, a corresponding downward adjustment shall be made in the Reserve Pumping Capacity required of Developer hereunder, it being the intent of the parties that any such action by the Water Corporation shall decrease the Reserve Pumping Capacity rather then increase the obligation of the Developer to provide water in connection with future development in the Subdivision.

c. *Restriction on Right to Expand the Service Area of the Water Corporation*. The parties agree that, other than as set forth herein, the Water Corporation shall not incorporate additional geographical areas to its service area except with the consent of Developer, and then only on the terms and conditions set forth in a subsequent agreement between the parties.

3. **Currently Planned Expansion of the Water System.** There is a current need to expand the Water System in order for the Water System to be capable of providing adequate water service to unsold lots in the Subdivision, as well as to lots in the planned Division 8, while maintaining the Reserve Pumping Capacity. To facilitate and coordinate such expansion, the parties agree as follows:

    a. *Restrictions on Transfer of Membership and of Establishment of New Water Service.* The Water Corporation shall not be required to transfer the membership appurtenant to any lot beyond the currently occupied 104 lots, or to begin to provide water service to any such additional lots, unless and until Developer has completed construction of the Expansion Project described below.

b. *Construction of Expansion to Water System.*

(i) Responsibility for Expansion and Construction. Developer shall have the responsibility and obligation, at its sole cost and expense, to develop and install the wells, pumps, booster pump, water mains, storage tanks and other facilities necessary and appropriate to expand the Water System, at a minimum, to a sufficient capacity to obtain approval from the DEQ to service an additional 29 lots (*i.e.*, Division 8 of the Comore Loma Subdivision), but developer may provide such additional pumping capacity above 29 lots as it deems advisable considering other planned divisions of the Subdivision ("the Expansion Project"). All work on the Expansion Project shall be performed to the satisfaction of a qualified project engineer, licensed in Idaho, who shall determine the quality, acceptability and fitness of the items of work and materials which are to be provided and paid for hereunder, and to the standards imposed on the Expansion Project by law and by the DEQ.

(ii) Joint Responsibilities. The parties shall jointly share the responsibility and obligation to obtain any governmental approvals of the Expansion Project required by law, and to such end the parties shall cooperate in good faith to apply for, process and obtain such approvals in time to allow for the construction to take place within the time limits set forth below. The parties shall also jointly share the responsibility to coordinate the connection of the Expansion Project to the existing Water System, and to do all other things that require their participation to complete the planning, approval, construction and hookup of the Expansion Project in a timely, orderly and efficient fashion.

(iii) Transfer of Expansion Project to Water Corporation. Upon completion of the Expansion Project by Developer, Developer shall take all steps necessary or appropriate to transfer ownership of the Expansion Project to the Water Corporation, such that the Water Corporation shall continue to own the Water System, as expanded by the Expansion Project. All references to the term "Water System" herein shall include the entire Water System as the same may be expanded and transferred to the Water Corporation at the applicable time in question.

c. *Inclusion of New Divisions in the Water Corporation*. The Water Corporation shall, at such times as: (i) the final plat for each additional division (beginning with Division 8) has been accepted by the County of Bonneville, State of Idaho; (ii) the DEQ has approved the provision of water from the Water System to such division; and (iii) the Expansion Project has been completed and paid for by Developer, and includes sufficient capacity to maintain the Reserve Pumping Capacity for the benefit of the Water Corporation; take all corporate actions necessary or appropriate to incorporate such division into the geographical area authorized to be serviced by the Water Corporation. The Water Corporation shall also at such time add the lots contained within each such new division to the membership total owned by Developer (or to such other person or entity to whom any of such lots may have been conveyed)

d. No Hook-up Fees or Assessments. The fulfillment of Developer's responsibilities under this paragraph shall excuse it (and its successors-in-interest to the unsold lots in the Subdivision not actually now receiving water, and its successors-in-interest to lots in additional divisions thereof added to the Water Corporation pursuant to paragraph 3.c. of this agreement) from any responsibility to pay any hook-up fee, assessment, or other charge calculated to cover the cost of construction, installation or hookup of the Expansion Project to the Water System or to otherwise make water available to those lots. NOTWITHSTANDING THE FOREGOING, Developer or its predecessors have previously sold five (5) lots in the Subdivision without water rights, that is, without also selling to the purchaser thereof the share of stock in the Water Corporation appurtenant thereto, in consideration for which Developer gave such purchasers a discount on the price of the lots. Those five lots are:

> Comore Loma Subdivision, Division 5, Block 8, Lots 15 and 16; Block 10, Lots 7 and 11; and Block 12, Lot 7

Water Corporation agrees that Developer may determine, assess and collect a hookup fee or assessment from the owner of each such lot upon application by such owner for membership in the Water Corporation.

4. **Subsequent Expansion of the Water System.** The parties recognize that continued development of the Comore Loma Subdivision by Developer will eventually require additional expansion of the Water System. The provisions of paragraph 3, together with all of its subparagraphs, shall apply to all such future expansions and development, with the following adjustments and modifications:

a. *Adjustment to Reserve Pumping Capacity*. In the event the DEQ shall increase or decrease the per lot pumping capacity of the Water System above or below the currently established rate of 10.1 gpm, than the Reserve Pumping Capacity of 52 homes shall be calculated based on the increased or decreased per lot pumping capacity established by the DEQ. PROVIDED, HOWEVER, that beginning with Division 8, Developer shall cause that the protective covenants for each new division of the Comore Loma Subdivision contain a restriction on the amount of water that may be used by a lot owner at any one time, and in the event that the increase in DEQ requirements is in part a result of the use by such lot owners of a volume of water in excess of the amounts permitted under those protective covenants, then to that extent there shall be no adjustment in the Reserve Pumping Capacity for purposes of this agreement. The parties agree to cooperate in good faith to enforce the water restrictions contained and to be contained in such protective covenants.

b. *Calculation of Actual Reserve Pumping Capacity*. The actual Reserve Pumping Capacity shall be the difference between the number of approved home/lots by the DEQ and the actual number of homes/lots receiving water service from the Water Corporation, as adjusted, if necessary, by any decision of the Corporation to reduce the Pumping Capacity of the Water System as set forth in paragraph 2.b. hereof.

c. *Transfer of Expansion Project and Inclusion of Additional Divisions*. Developer shall have the same obligation to transfer each Expansion Project to the Water Corporation as it does with the currently anticipated Expansion Project under paragraph 3. The Water Corporation shall have the same obligation to incorporate additional divisions of the Comore Loma Subdivision to be serviced by the then expanded Water System into the geographical service area and membership of the Water Corporation as it does under paragraph 3 with the division(s) to be added thereunder.

d. *Termination of Agreement*. The obligations of the parties with regard to the construction of future expansions to the Water System servicing the Subdivision and its future additions contemplated herby may be terminated only by the mutual consent of the parties, it being the intent of the parties that, until so terminated or modified by mutual consent, this agreement shall govern all future development of contiguous tracts of real property by Developer and all expansions to the Water System associated therewith. Upon such termination by mutual consent, Developer shall be required to leave the Water System with the Reserve Pumping Capacity, as adjusted, if necessary, under the provisions of paragraph 2.b. hereof.

5. **Prior Agreements; Integration.** This agreement supersedes all prior agreements between the parties and any of their predecessors in interest, including but not limited to Richard T. Skidmore and Bon Adell Skidmore, all of which agreements are hereby declared to be terminated, null, void and of no further effect, and it is hereby expressly agreed that no further liabilities exist between the parties based on such prior agreements. This agreement contains the entire agreement of the parties with regard to the subject matter hereof, and there are no representations, agreements, warranties or conditions which have not been set forth herein. This agreement may not be amended, modified or terminated by the parties except in a writing signed by the parties.

6. **Exercise of Membership Rights.** Nothing contained herein shall require Developer to exercise its voting rights in the Water Corporation in any particular manner, and Developer shall remain freely able to vote on any matter coming before the membership of the Water Corporation as if it were not a party to this Agreement.

7. **Attorney fees and cost.**

    a. *Cost of preparing this agreement.* The parties agree that Petersen, Moss, Olsen, Carr, Eskelson & Hall has represented Developer in this matter, but they nevertheless agree that the parties shall pay in equal shares the portion of said attorney fees related to the drafting of this agreement. Each party shall pay its or their own attorney fees and cost incurred in negotiations and other matters regarding this agreement. Developer shall cause said attorneys to keep track of their time for such matters in separate bills.

    b. *In Event of Default.* Should either party default in the performance of any term, condition or provision of this agreement, that party shall pay to the other party all cost and expenses, including reasonable attorney fees, incurred in seeking enforcement of this agreement or relief from its breach, whether incurred in court proceedings or otherwise.

8. **Binding Effect.** This agreement shall extend to, be binding upon and inure to the benefit of the respective heirs, personal representatives, assigns and other successors in interest of the parties hereto.

In WITNESS WHEREOF the parties have executed this agreement as of the day and year first above written.

COMORE LOMA WATER CORPORATION

By: Thayne Judd
President

Attest: Gary Adams
Secretary

CO-MORE DEVELOPMENT, INCORPORATED

By: Richard Skidmore
President

Attest: Brett Skidmore
Secretary

(All signatures on file)

Comore Loma

Cross Connection Control Program

Rev 0, 4-8-2013

Authority
Idaho Administrative Procedures Act (IDAPA) 58.01.08.543 requires a written cross connection control program to protect the customers from contamination of their water supply. Idaho Code is reproduced below in blue.

There shall be no connection between the distribution system and any pipes, pumps, hydrants, water loading stations, or tanks whereby unsafe water or other contaminating materials may be discharged or drawn into a public water system. The water purveyor is responsible through its cross connection control program to take reasonable and prudent measures to protect the water system against contamination and pollution from cross connections through premises isolation or containment, internal or in-plant isolation, fixture protection, or some combination of premises isolation, internal isolation, and fixture protection.

IDAPA 58.01.08.552.06 requires the following.

06. Cross Connection Control Program - Community Water Systems. The water purveyor is responsible through its cross connection control program to take reasonable and prudent measures to protect the water system against contamination and pollution from cross connections through premises isolation, internal or in-plant isolation, fixture protection, or some combination of premises isolation, internal isolation, and fixture protection. Pursuant to Section 543, all suppliers of water for community water systems shall implement a cross connection control program to prevent the entrance to the system of materials known to be toxic or hazardous. The water purveyor is responsible to enforce the system's cross connection control program. The program will at a minimum include: (4-7-11)

a. An inspection program to locate cross connections and determine required suitable protection. For new connections, suitable protection must be installed prior to providing water service. (5-8-09)

b. Required installation and operation of adequate backflow prevention assemblies. Appropriate and adequate backflow prevention assembly types for various facilities, fixtures, equipment, and uses of water should be selected from the Pacific Northwest Cross Connection Control Manual, the Uniform Plumbing Code, the AWWA Recommended Practice for Backflow Prevention and Cross Connection Control (M14), the USC Foundation Manual of Cross Connection Control, or other sources deemed acceptable by the Department. The assemblies must meet the requirements of Section 543 and comply with local ordinances. (4-7-11)

c. Annual inspections and testing of all installed backflow prevention assemblies by a tester licensed by a licensing authority recognized by the Department. Testing shall be done in accordance with the test procedures published by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research. See the

USC Foundation Manual of Cross-Connection Control referenced in Subsection 002.02. (4-7-11)

d. Discontinuance of service to any structure, facility, or premises where suitable backflow protection has not been provided for a cross connection. (4-7-11)

In the event that an assembly fails the annual test, the homeowner is required to repair or replace the assembly within ten days. Failure to repair or replace the assembly and submit satisfactory test reports on the repaired or replaced assembly will result in termination of water service with appropriate termination fees and reconnection fees.

The Comore Loma Water Corporation will ensure compliance with the requirements above. The water users are required to provide reasonable access to the water operator or a member of the Corporation to verify compliance with these regulations. Failure to provide reasonable access may result in termination of service.

The cross connection control program for Comore Loma primarily consists of ensuring that the homeowners have suitable backflow prevention assemblies on the lawn irrigation systems and that these assemblies are tested annually. A test report form completed by a State Certified Backflow Assembly Tester must be provided to the Comore Loma Water Corporation at least annually.

The corporation is responsible for other aspects of the rules such as requiring that users with auxiliary pumps or wells that could force unmonitored water into the system is either isolated from the system or fitted with a suitable backflow assembly. The Water Operator monitors the water in the system in accordance with the DEQ requirements. That monitoring ensures that the water delivered through the system is safe to drink. An individual well or auxiliary water system is not monitored and if the water in that system is allowed to enter the public water system, there is no reasonable assurance that the public water system is safe to drink.

All other requirements of IDAPA 58.01.08 that address Cross Connection Control will be enforced by the corporation. It is expected that the homeowners will only be exposed to the potential cross connections mentioned above.

A list of certified backflow assembly testers is available at https://secure.ibol.idaho.gov/eIBOLPublic/LPRBrowser.aspx?Profession=WWP&DefaultBoard=Y. You must type "BAT" in the license number field (not the license type field) and "Idaho Falls" in the city field.

Rev 0 04-08-2013

State of Idaho

Bureau Of Occupational Licenses

Public Record Information (Detail)

Public Record

Name:	Mr. RANDY A SKIDMORE
Profession:	DRINKING WATER & WASTEWATER PROFESSIONALS
Type:	DRINKING WATER DISTRIBUTION OPERATOR - VERY SMALL S
Number:	DWDVSWS - 11524
Address Of Record:	
City/State/Zip:	IDAHO FALLS ID 83406
Country:	USA
Business Phone:	(208) 529 - 3672
Original Date of Issue:	1/6/2004
Registered/Licensed By:	
Status:	Current
Discipline Status:	
Expiration Date:	1/26/2014

Disciplinary Action Documents

None

NOTE: This document is a copy of the electronic record of the person named above and constitutes a verification of that record. If official certification of this record is required, a written request must be submitted together with a $10.00 fee to the Bureau of Occupational Licenses, 700 West State Street, PO Box 83720, Boise, Idaho 83720-0063.

State of Idaho

Bureau Of Occupational Licenses

Public Record Information (Detail)

Public Record

Name:	MR. COLVIN E JERGINS
Profession:	DRINKING WATER & WASTEWATER PROFESSIONALS
Type:	DRINKING WATER DISTRIBUTION OPERATOR - CLASS I
Number:	DWD1 - 13610
Address Of Record:	
City/State/Zip:	IDAHO FALLS ID 83406
Country:	USA
Business Phone:	(208) 357 - 6154
Original Date of Issue:	3/29/2005
Registered/Licensed By:	
Status:	Current
Discipline Status:	
Expiration Date:	3/26/2014

Disciplinary Action Documents

None

NOTE: This document is a copy of the electronic record of the person named above and constitutes a verification of that record. If official certification of this record is required, a written request must be submitted together with a $10.00 fee to the Bureau of Occupational Licenses, 700 West State Street, PO Box 83720, Boise, Idaho 83720-0063.

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

900 North Skyline Dr., Suite B • Idaho Falls, Idaho 83402 • (208) 528-2650

C.L. "Butch" Otter, Governor
Curt Fransen, Director

September 17, 2013

Comore Loma Water Corporation
Randy Skidmore
PO Box 1863
Idaho Falls, ID 83403

Re: Comore Loma Water System Facility Planning Study, Drinking Water, Bonneville County, DEQ #13-08-10

Dear Mr. Skidmore:

We have reviewed the **Facility Planning Study** for the Comore Loma Water System prepared by Schiess and Associates. The Department hereby approves the Facility Planning Study as fulfilling the technical portion of the Facility Plan. If the water system intends to pursue a construction loan from the DEQ's State Revolving Loan Fund (SRF) an environmental information document must be completed and approved prior to receiving funding.

Although it is not covered in the scope of this project, the water system should consider upgrading some of the existing distribution system in the future to ensure the entire system can sufficiently meet 1500 gpm fireflow and 20psi minimum pressure throughout the system as indicated in Appendix B.

Please feel free to contact me if you have any questions or comments at Carlin.Feisthamel@deq.idaho.gov or 208-528-2650.

Sincerely,

Carlin Feisthamel, P.E.
Water Quality Engineer
Idaho Falls Regional Office

c: Greg Eager, P.E., Regional Engineering Manager, DEQ-IF
Paul Scoresby, P.E., Schiess and Associates
William Teuscher. P.E. Staff Engineer, DEQ-IF
Rochelle Mason, Water Quality Analyst, DEQ-IF

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

900 North Skyline Drive, Suite B • Idaho Falls, ID 83402 • (208) 528-2650

C. L. "Butch" Otter, Governor
Curt A. Fransen, Director

January 16, 2014

Comore Loma Water Corporation
Randy Skidmore
P.O. Box 1863
Idaho Falls, ID 83403

Re: Comore Loma Water System Facility Planning Study (Jan 2014 Revision) Review. DEQ# 13-08-10

Dear Mr. Skidmore:

After our review of the revised FPS for the Camore Loma water system we find the FPS to meet states standards and is therefore approved. In order to be eligible for the DEQs State Revolving Loan Funds (SRF) an Environmental Information Document (EID) must be completed and approved by our department prior to receiving funding for your project.

If you need additional information or have any questions please call me at 208-528-2650.

Sincerely,

William Teuscher PE
Water Quality Engineer
DEQ-IFRO

C. Paul Scoresby P.E., Schiess & Associates

Appendix H: Environmental Information Document (EID)

- EID dated May 27, 2014
- Draft FONSI and Cover Letter to CLWC dated May 30, 2014
- FONSI and Cover Letter to CLWC dated July 14, 2014

COMORE LOMA WATER SYSTEM FACILITY PLANNING STUDY ENVIRONMENTAL INFORMATION DOCUMENT

Revised May 27, 2014

Prepared by:

Schiess & Associates
IMPROVING COMMUNITY INFRASTRUCTURE

7103 South 45th West, Idaho Falls, ID 83402
Phone: 208-522-1244 | Fax: 208-522-9232

Project No. 12076

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ABBREVIATIONS

Alt.	Alternative
bgs	Below Ground Surface
cfs	Cubic Feet per Second
CLWC	Comore Loma Water Corporation
DEQ	Department of Environmental Quality
EDU	Equivalent Dwelling Unit
EID	Environmental Information Document
EPA	Environmental Protection Agency
F	Fahrenheit
FPS	Facility Planning Study
Ft	Feet
gpd	Gallons per day
gpm	Gallons per minute
Hp	Horse power
IDWR	Idaho Department of Water Resources
IOC	In-Organic Contaminants
kW	Kilowatt
LMI	Low to middle income
mg/L	Milligrams per liter (same as parts per million)
MCL	Maximum Contaminant Level
Mo	Month
O&M	Operations and Maintenance
ppm	Parts per million (same as mg/L)
psi	Pounds per square inch
PVC	Poly Vinyl Chloride
Rules	Idaho Drinking Water Rules (IDAPA 58.01.08)
SERP	State Environmental Review Process
SCADA	Supervisory Control and Data Acquisition
SHPO	State Historic Preservation Office
SRF	State Revolving Fund
Sq.	Square Feet
TDH	Total Dynamic Head
THPO	Tribal Historic Preservation Office
USACE	United States Army Corps of Engineers
USDA-RD	United States Department of Agriculture-Rural Development
VFD	Variable Frequency Drive

1.0 COVER SHEET

1.1 Applicant

President John Buttles
Comore Loma Water Corporation
P.O. Box 1863
Idaho Falls, ID 83403
(208) 346-6574

1.2 Project Contact Person

Paul H. Scoresby, PE
Schiess & Associates Consulting Engineers
7103 South 45th West
Idaho Falls, ID 83402
pscoresby@schiesseng.com
(208) 522-1244

1.3 Project Costs and Funding

1.3.1 Estimated Construction Costs – Alternative 13

Estimated Project Costs:	**Total**
Transmission and Distribution System	$1,352,827
Treatment	$0
Storage	$900,359
Source	$622,013
Sub Total	**$2,875,200**
Contingency	**$174,800**
Total Cost	**$3,050,000**

1.3.2 Funding

Funding:	
DEQ Share	$3,050,000
Other Share	$0
Total Funding	**$3,050,000**

1.4 What Kind of Document is the EID?

The Comore Loma Environmental Information Document will be attached to the facility planning study as Appendix H and referenced in the facility plan.

1.5 Estimated User Costs

User costs were determined by analyzing past Operations and Maintenance (O&M) costs, estimating O&M costs of new facilities and projecting increases to repay the loan.

Estimated Average Residential Water User Costs

		User Class		
		Home	Private Lots w/o Home	Developer Lots
A .	Current Average Monthly User Charge per EDU	$97.00	$0	$0
B .	Change in Operation & Maintenance Monthly per EDU	$-9.00	$0	$0
C .	Change in Debt Service Monthly Charges per EDU	$15.00	$15.00	$49.00
D .	Future Average Monthly User Charge Per EDU (A+B+C)	**$103.00**	**$15.00**	**$49.00**

The Corporation board raised user fees in 2013 to restore capital used for repairs and renovation of the Well 5 pump station. Due to the variability of operation and maintenance costs in the last few years, we expect that O&M costs, on average, will reduce when operating new systems built via this project. The Corporation raised rates in 2013 to the extent that current revenue exceeds current costs. Existing homes should see, on average, an estimated $6.00 per month increase in their water rate fees.

1.6 Abstract

The Comore Loma Water Corporation Water System Facility Planning Study, technically approved on January 16, 2014, evaluates several alternatives to improve the existing water supply and distribution system. The No Action Alternative was also evaluated. After receiving public input and following a public meeting held in January 23, 2014, the constituents of the Comore Loma Water Corporation voted to proceed with improvements identified as Alternative 13 in the facilities planning study minus the individual water meters. This EID provides a summary of the project purpose and need, summarizers the alternatives that were developed and provides a comparison of the environmental effects and costs. It also provides a detailed description and environmental analysis of the environmental effects of the selected alternative. Alternative 13 was selected because it addresses all identified deficiencies of the water system at a reasonable cost increase to the users. There appears to be no environmental effects except for those of a temporary nature common to construction of new public works.

2.0 PURPOSE AND NEED FOR THE PROPOSED PROJECT

Comore Loma Water Corporation began serving water to customers around 1972 with a well and storage tank. Since then this community has grown into a water system serving 320 homes over three pressure zones using water from five wells, all of which are positioned in the lowest pressure zone in the system. There remain approximately 214 vacant lots scattered throughout the community that will eventually be developed and served water.

In the summer of 2012, the system experienced several unfortunate events that compromised the overall production capacity of system wells. The results of these events were chronic lack of water supply and empty storage tanks. This resulted in low pressure for many homes including the inability to take showers, the inability to water lawns and keep lawns green. Frustration of system patrons resulted in calls for change. These events became the impetus for the water system board to seek professional help to diagnose problems, explore solutions to improve the reliability of water delivery and ensure that there is always adequate pressure for daily needs, including irrigation. Additionally, the water corporation board formalized its operations by initiating independent financial audits, instituting irrigation schedules and increasing water usage fees to fund improvements and cover maintenance costs. These efforts resulted in preparation of a water system facility planning study endorsed by the water corporation board and DEQ that recommends many improvements to the water system.

The water facility planning study identified several items out of compliance with the Idaho Rules for Public Drinking Water Systems (hereafter called the "Rules"). These include a lack of water supply redundancy, a lack of redundancy of Booster Pump Station (BPS) pumps, inadequate standby storage in the event of a power outage, a lack of fire flow pumping ability to the third highest pressure zone, a lack of fire flow capability during the summer months when irrigation demand is the highest, a lack of flow metering at several well houses and lastly no provision for water supply at the uppermost pressure zone (Zone 4). The needed infrastructure to accomplish this plan is given in Chapter 3 of this report.

These improvements are needed to bring the water system up to Bonneville County fire flow standards and hydrant spacing standards, increase redundancy of well sources so that the system can function well even if a well is out of service, maintain needed fire flow storage in water storage tanks, ensure fire flow is available at every platted lot, provide portable emergency power to ensure that water will always be available to every lot during a loss of power, including the lots in the upper elevations of the system and provide needed pumping capacity and redundancy from the lower pressure zone to the upper pressure zones. These improvements will bring the water system into compliance with the Idaho Rules for Public Drinking Water Systems.

3.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

3.1 Alternative Analysis

This alternative analysis includes the No Action alternative as well as Alternative's 11 and 13 given in the facility planning study. Both Alternative 11 and Alternative 13 are presented with and without water meters.

Of all of the alternatives presented in the facility planning study, these alternatives were considered strongly enough by the water corporation board that they were eventually presented to the system patrons at the public meeting. All other alternatives were eliminated by the board after many weekly discussions deciding how best to resolve system deficiencies. These meetings included significant input from DEQ and the Engineer.

Only three alternatives considered water conservation: 11, 12 and 13. Of these three alternatives, Alternatives 11 and 13 were developed around providing fire flow by storage in water tanks. Alternative 12 considered the provision of fire flow by drilling more wells and not building fire flow storage into the storage tanks. Alternative 12 was ruled out by the water corporation board based on high operations costs and the associated need to provide multiple emergency generators to supply fire flow during all seasons of the year to comply with the Rules.

3.1.1 No Action

The system is short on redundancy, overall well capacity, storage capacity and emergency power supply. No action would continue to see the water system operate with considerable risk to customers regarding fire flow availability and adequate water supply and pressure during the hot summer months and when the power goes out. Those located in the upper parts of the system are particularly at risk. Some homes in the upper parts of the system have drinking water but very little fire flow to protect their homes. A few lots currently cannot be served drinking water due to the lack of pumping stations and storage.

Without improvements to the water system, the water system would remain non-compliant with the Rules as described in the third paragraph of the previous chapter.

3.1.2 Alternative 11

This project alternative includes the following items:

- Remove existing Tank 1 and Replace with new, larger Tank 1
- Drill a replacement well and well house for Well 1 near Tank 1
- Construct new Booster Pump Station (BPS) adjacent to new Tank 1
- Construct additional storage tank near Tank 2. This additional storage tank is not Tank 3 presented as part of Alternative 13. This additional storage tank would provide adequate fire flow storage and equalization storage for Zone 2 directly and for Zone 3 via the Tank 2 BPS upgrade listed in the next bullet point.
- Upgrade Tank 2 BPS
- Loop Division 25 with eight inch pipe
- Add flow meters to existing well pump stations at Well 2, Well 3, Well 4 and Well 5

and improve SCADA system to obtain flow trend lines and flow totaling data.

- Add 24 fire hydrants at various locations in the distribution system.
- Replace broken distribution system valves. The location of valve replacement could be near any existing hydrant and any existing distribution pipe intersection.
- Purchase a portable generator and install manual switch gear for emergency use of BPS adjacent to Tank 1, BPS on Big Bend Drive and at one existing well yet to be determined
- Install water meter boxes and meters on service lines for each home.

This alternative is presented with and without water meters to each home as this is the way the corporation board presented the alternatives to its patrons at the public meeting.

3.1.3 Alternative 13

This project alternative includes the following items:

- Remove existing Tank 1 and Replace with new, larger Tank 1
- Construct Tank 3
- Finish drilling We117. The test hole for this well has been completed and was finished at 730 feet deep. Expected production is +1- 1,000 gpm.
- Construct new BPS adjacent to new Tank 1
- Complete the construction of the BPS on Big Bend Drive. The structure and underground piping for this building has already been completed.
- Install transmission pipe from existing distribution system to Tank 3.
- Add flow meters to existing well pump stations at Well 2, Well 3, Well 4 and Well 5 and improve SCADA system to obtain flow trend lines and flow totaling data.
- Add 24 fire hydrants at various locations in the distribution system.
- Replace broken distribution system valves. The location of valve replacement could be near any existing hydrant and any existing distribution pipe intersection.
- Purchase a portable generator and install manual switch gear for emergency use of BPS adjacent to Tank 1, BPS on Big Bend Drive and at one existing well yet to be determined.
- Install water meter boxes and meters on service lines for each home.

This alternative is presented with and without water meters to each home as this is the way the corporation board presented the alternatives to its patrons at the public meeting.

3.2 Low-cost Alternative

Although Alternative 11 has the lowest overall capital cost and Operations and Maintenance (O&M) cost, it would cost each homeowner more to implement compared to Alternative 13. Alternative 13 does have a higher capital cost and O&M costs because it includes more facilities and thus more maintenance than Alternative 11. With the implementation plan of Alternative 13, the bylaws and developer agreement would be re-written to allow the Corporation to assess vacant lots a fair share of the loan repayment costs. The developer will pay a super share of loan repayment costs for the vacant lots he owns to compensate for the infrastructure being built as part of the project that he remains responsible for in the development of existing lots. With all lots paying the repayment costs of the loan, Alternative 13 emerges as the low-cost alternative to the users of the system.

The portions of the project that the developer essentially remains responsible for include Well 7, Big Bend BPS, Tank 3 and the accompanying water transmission line.

This is not possible with Alternative 11 because it purposely did not include infrastructure that the developer was responsible for. Thus only the current homeowners would have to pay for the loan.

3.3 Analyze Alternatives with Respect to Environmental Impacts, Costs to Mitigate Environmental Impacts and Capital and Operating Costs

The breakdown of cost into the categories of transmission and distribution system, treatment, storage and source are given on the following five tables (Tables 1-5) for each alternative included in this report.

3.3.1 Analyze Alternatives

Table 1 – No Action

Category	Improvements	Capital Costs
Transmission and Distribution System	• None	$0
Treatment	• None	$0
Storage	• None	$0
Source	• None	$0
Total		**$0**

Table 2 – Alternative 11 (With Water Meters)

Category	Improvements	Capital Costs
Transmission and Distribution System	• Replace broken distribution system valves and add 24 fire hydrants • Add flow meters to existing pump stations • Booster pump station at Tank 1 and three phase power to site capable of 1,725 gpm without generator • Upgrade Tank 2 booster pump station to three 40 Hp pumps • Loop Zone 3 with eight inch pipe • Portable trailer mount 300 KW generator primarily for Tank 2 BPS and manual switch gear for one well, Tank 1 BPS and Tank 2 BPS • Water meters at each residence • SCADA improvements for water meters in well houses and programming for flow data trend lines, pump operating hours and cumulative reports.	$1,706,982
Treatment	• None	$0
Storage	• New 422,000 gallon storage tank for Zone 1 • Additional storage tank (not Tank 3) at Tank 2 site holding 342,000 gallons	$769,707
Source	• Replace Well 1 with new well capable of producing 1,667 gpm • Well house for Well 1 with vertical turbine pump, no generator	$710,211
Total		**$3,786,900**

Table 3 – Alternative 11 (Without Water Meters)

Category	Improvements	Capital Costs
Transmission and Distribution System	• Replace broken distribution system valves and add 24 fire hydrants • Add flow meters to existing pump stations • Booster pump station at Tank 1 and three phase power to site capable of 1,725 gpm without generator • Upgrade Tank 2 booster pump station to three 40 Hp pumps • Loop Zone 3 with eight inch pipe • Portable trailer mount 300 KW generator primarily for Tank 2 BPS and manual switch gear for one well, Tank 1 BPS and Tank 2 BPS • SCADA improvements for water meters in well houses and programming for flow data trend lines, pump operating hours and cumulative reports.	$1,064,297
Treatment	• None	$0
Storage	• New 422,000 gallon storage tank for Zone 1 • Additional storage tank (not Tank 3) at Tank 2 site holding 342,000 gallons	$769,647
Source	• Replace Well #1 with new well capable of producing 1,667 gpm • Well house for Well 1 with vertical turbine pump, no generator	$710,156
Total		**$2,544,100**

Table 4 – Alternative 13 (With Water Meters)

Category	Improvements	Capital Costs
Transmission and Distribution System	• Replace broken distribution system valves and add 24 fire hydrants • Add flow meters to existing pump stations • Booster pump station at Tank 1 and three phase power to site capable of 1,725 gpm without generator • Finish Big Bend BPS with three 60 Hp pumps • Install transmission pipe from Zone 4 to Tank 3 • Portable trailer mount 300 KW generator primarily for Tank 2 BPS and manual switch gear for one well, Tank 1 BPS and Big Bend BPS • Water meters at each residence • SCADA improvements for water meters in well houses and programming for flow data trend lines, pump operating hours and cumulative reports.	$1,994,977
Treatment	• None	$0
Storage	• New 422,000 gallon storage tank for Zone 1 • Tank 3 bolted steel tank holding 533,000 gallons	$900,152
Source	• Drill new Well 7 capable of producing 1,000 gpm • Well house and vertical turbine pump for new Well 7	$621,870
Total		**$3,517,000**

Table 5 – Alternative 13 (Without Water Meters)

Category	Improvements	Capital Costs
Transmission and Distribution System	• Replace broken distribution system valves and add 24 fire hydrants • Add flow meters to existing pump stations • Booster pump station at Tank 1 and three phase power to site capable of 1,725 gpm without generator • Finish Big Bend BPS with three 60 Hp pumps • Install transmission pipe from Zone 4 to Tank 3 • Portable trailer mount 300 KW generator primarily for Tank 2 BPS and manual switch gear for one well, Tank 1 BPS and Big Bend BPS • SCADA improvements for water meters in well houses and programming for flow data trend lines, pump operating hours and cumulative reports.	$1352,827
Treatment	• None	$0
Storage	• New 422,000 gallon storage tank for Zone 1 • Tank 3 bolted steel tank holding 533,000 gallons	$900,359
Source	• Drill new Well 7 capable of producing 1,000 gpm • Well house and vertical turbine pump for new Well 7	$622,013
Total		**$2,875,200**

3.3.2 Environmental Impacts

Table 6 – Cursory Environmental Screening

Environmental Criteria	Alternative No. 1 No Action	Alternative No. 2 Alternative 11 with and without water meters	Alternative No. 3 Alternative 13 with and without water meters
Physical Aspects (Topography, Geology and Soils) and Climate	No Impact	Requires Excavation for New Water Transmission Line, Buried Power Line, Storage Tanks and Well Drilling at Well 1	Requires Excavation for New Water Transmission Line, Buried Power Line, Storage Tanks and Continued Well Drilling at Well 7
Population, Economic and Social Profile	May limit the ability to provide for future connections	Increased User Rates	Increased User Rates
Land Use	No Impact	No Long Term Adverse Impact. All Facilities will be Built in Designated Areas according to Planning Documents	No Long Term Adverse Impact. All Facilities will be Built in Designated Areas according to Planning Documents
Floodplain Development	No Impact	Project not Located in Floodplain	Project not Located in Floodplain
Wetlands	No Impact	No Wetlands Within the Project Vicinity	No Wetlands Within the Project Vicinity
Wild and Scenic Rivers	No Impact	No Wild and Scenic River Within the Project Vicinity	No Wild and Scenic River Within the Project Vicinity
Cultural Resources	No Impact	No Impact	No Impact
Flora and Fauna	No Impact	Minimal Impact	Minimal Impact
Recreation and Open Space	No Impact	No Adverse Impact	No Adverse Impact
Agricultural Lands	No Impact	No Impact	No Impact
Air Quality	No Impact	No Adverse Impact	No Adverse Impact
Energy	No Increase in Energy Consumption	Overall Increase in Consumptive Energy	Overall Increase in Consumptive Energy
Regionalization	No Impact	No Impact	No Impact
Water Quality	No Impact	No Impact	No Impact

3.3.3 Costs to Mitigate Environmental Impacts, Capital Costs and Operating Costs

The mitigation costs for environmental impacts, capital costs and operating costs are given in Table 6.

Table 7 – Cost to Mitigate, O&M Costs and Capital Costs

	No Action	Alternative 11 w/meters	Alternative 11 w/o meters	Alternative 13 w/meters	Alternative 13 w/o meters
Cost to Mitigate	$0	$40,000	$40,000	$40,000	$40,000
O&M Costs	$349,900	$310,000	$318,815	$316,400	$325,390
Capital Costs	$0	$3,186,900	$2,544,100	$3,517,000	$2,875,200

The tables used to generate the mitigation costs in Table 7 are given in Chapter 5.

3.4 Best Alternative

The Corporation selected Alternative 13 without water meters. The Water Corporation determined it best met the long term needs for the Corporation. It is not the low-cost alternative. The low-cost Alternative 11 did not meet the long term needs of the Corporation or allow for self-determined pro-active action in constructing water supply infrastructure. Alternative 13 was selected by the overwhelming support of the system patrons by vote.

3.4.1 Treatment and Distribution

No treatment is planned for this project.

3.4.2 Location of Proposed New Facility, or Footprint of Project Components

Locations are shown on Figure 1. The site for replacement of Tank 1 and the proposed Tank 1 BPS is a moderately sloping area located away from any homes. The property appears suitable in every way for a new tank and BPS.

When the Water Corporation is ready to improve water supply by drilling Well 7, a drilling permit for the well will be required. There appears to be adequate water rights to allow for drilling this well. After the project is completed and the system grows, necessitating another well, we suggest the next well be drilled at the Tank 1 site (new Well 1). The Tank 1 lot is of substantial size to house the storage tank, BPS and a future well that will be a replacement well for existing Well 1.

3.4.3 Environmental Impacts

A new storage tank would replace existing Tank 1 and a new BPS constructed nearby. A buried power line will be placed from Well 4 to the proposed BPS near Tank 1. Although the alignment for this power line follows an existing water main line connecting Well 4 to Tank 1, the buried power line would be laid in a parallel trench to the water line through ground that has not been disturbed previously. Hydrants would be added along existing waterlines and roads which have already been disturbed for installation of the water mainline The BPS structure for an upgraded Zone 3 BPS on Big Bend Street is already built. Only pumps and electrical controls remain to be installed. A test well for Well 7 has already been drilled and is currently capped and awaiting completion of the production well. The test well was drilled in 2007. This is a platted well site and the site has already been disturbed.

There appears to be little to no threat of surface water influence to future construction in the area around existing Tank 1 where the proposed larger tank and new BPS would be built. Each well has been established and placed into service in accordance with DEQ requirements. Ground water levels are no closer to the surface than 175 feet below ground surface according to well drilling logs of the existing production wells.

The character of the soil through which water mains are to be laid is typical loess for the eastern hillsides of the Snake River plain in Bannock, Bingham, Bonneville, Jefferson and Madison Counties. The USDA soil survey for Bonneville County classifies the soil as Potell and Ririe silt loam. The soil depth can exceed 60 inches. Occasional shallow lava rock may also be found. The soil is moderately alkaline and is subject to piping. Erosion hazard is moderate to high depending on ground slope. Any foundation design constructed in this area should follow at a minimum the local building code. Measures should be taken to prevent erosion both long-term at each site and during construction.

Mitigation costs are expected only for construction related items such as dust control, erosion control and leak and spill containment from heavy equipment.

3.5 Justification of Why Best Alternative is not the most Cost-effective

As stated in Subsection 3.2, Alternative 13 is the most cost-effective alternative. Perhaps the strongest argument for supporting Alt. 13 is the amount of infrastructure that is included. This alternative provides all needed long-term water supply needs in the upper reaches of the system for complete build-out of all vacant lots with the exception of well water supply by an estimated 667 gpm. Specifically, this applies to the water corporation taking on the remaining construction of Big Bend BPS, Tank 3 and the accompanying water transmission line and Well 7. These items are the items that the developer must pay for. This action is possible if the water corporation makes policy changes to its water corporation bylaws and the developer agreement. With the water corporation taking this action by vote of the patrons, the water corporation will no longer rely on the existing developer for needed water supply facilities to serve approved lots. The design of new supply facilities would be directed by the water corporation and not the developer.

4.0 AFFECTED ENVIRONMENT

4.1 Description of the Proposed Project Planning Area (PPPA)

4.1.1 Boundaries

The subdivision is bounded by Township Road (65th South) on the North and Crowley Road (45th East) on the West. It sits in parts of Sections 1 and 12 of Township 1 North, Range 38 East and Sections 5, 6 and 7 of Township 1 North, Range 39 East.

The PPPA consists of all 25 divisions of the entire Comore Loma Subdivision and small portions of Section 5 and Section 8 of Township 1 North Range 39 East as shown on the Figure 1 in Chapter 5 to encompass the location of the proposed water transmission line and proposed Tank 3 which are located up gradient from the community.

Comore Loma Water Corporation was developed to serve members of the 25 divisions of the Comore Loma Subdivision and only serves water to those in the development.

4.1.2 Key Topographic and Geographic Features

The entire subdivision sits above the Snake River Plain on gently to steep sloping foothills. The exposed south, west and east slopes primarily consist of sage brush and grasses. The exposed north slopes can be rocky and provide dense undergrowth that fosters wildlife.

There are two overhead high voltage power transmission lines that dissect the community on a line running southeast-northeast east several hundred feet below Tank 1 and in the vicinity of Marbrisa Lane. There is another overhead high voltage power line that also runs southeast-northeast between the most easterly part of the sub-division and the location selected for Tank 3.

4.1.3 Population Distribution

The population in Bonneville County is estimated as 104,234 in the year 2010 by the U.S. Census Bureau. The population distribution according to ages is given in Table 8.

Age range (years)	Percentage of Population
Younger than 18	31.5%
18 to 24	8.5%
25 to 44	26.2%
45 to 64	23%
65 and older	10.9%

4.1.4 Industrial and Commercial Features

There are no industrial or commercial features in the proposed planning area.

4.2 Map of Proposed Project Planning Area (PPPA)

See Figure 1 in Chapter 5. The map includes the entire development consisting of 25 distinct platted divisions and the area encompassing the transmission line to Tank 3 and Tank 3 as described in Subsection 4.1.1. The entire planning area is in the moderately sloped foothills east of the Snake River Plain.

4.3 Area of Potential Effects (APE)

4.3.1 Direct, Indirect, Short-term and Long-term Effects

The direct, indirect, short-term and long-term effects for the proposed project are described in Subsection 3.3.2.

4.3.2 Map of the APE

The APE was determined to be the same area as the PPPA described in Subsection 4.1 and 4.2 above.

Since there were no effects to the environment found outside of the PPPA, the APE boundary is the same as the PPPA. All positive effects brought about through the implementation of the proposed project are internal to the community.

4.4 Major Features of Proposed Project

4.4.1 The Length and Diameter and Type of Material for Distribution Lines

The only waterline of significant length included in this project will connect the distribution piping in the upper part of the system to proposed Tank 3. This pipe is estimated to be 1,300 feet of 12 inch diameter PVC pipe. The length of the line was shortened compared to the length shown on the FPS and the PPPA maps because the historical walkthrough and preservation field work necessitated that the actual location be selected. This was done. Maps showing the actual location are labeled Figures 6a, 6b and 6c and are included in Chapter 5.

Also the project includes 24 new hydrants to narrow the hydrant spacing in the lower parts of the system. Broken valves located along existing waterlines will also be replaced.

4.4.2 The Number, Size, Depth and Location of Wells and Related Equipment and Structures

Well 7 is proposed to be completed as part of this project. The test well for this well was drilled in 2007. It is expected to be completed with 16 inch diameter steel casing. The depth of the well is expected to be 730 feet deep. The well is expected to pump ±1,000 gpm. It will take approximately 300 Hp to draw the water out of the well and pressure it to help fill Tank 2 and supply water to the Big Bend BPS. The well pump will operate by variable frequency drive (VFD). The building to be built around the well is expected to be approximately 720 square feet in size. It will be architecturally dressed to fit within the neighborhood of homes.

4.4.3 Storage Facilities, Pumping Stations and Fire Flow Requirements

New Tank 1 and Adjacent Booster Pump Station (BPS)

A new Tank of at least 422,000 gallons is scheduled to replace the existing 100,000 gallon Tank 1. It is expected that this tank will be the bolted steel type. The BPS to be built adjacent to the tank but slightly downhill is expected to be approximately 900 square feet in size. The station will consist of three 75 Hp pumps, one of which will be redundant to the other two. We expect that VFD's will drive these pumps to provide better operational control and save energy. The expected production capacity of the BPS is 1,725 gpm.

<u>Big Bend BPS</u>
This BPS will pump water to proposed Tank 3. This BPS will need to pump 1,215 gpm. This should be accomplished with three 60 Hp pumps, one of which is redundant to the other two. The BPS structure and underground piping leading to and from the building is already in place. This project will complete the structure, landscaping and install the pumps and controls.

<u>Tank 3</u>
Tank 3 is proposed high up on the hillside to provide direct water pressure for homes at the top of the development that currently do not have pressure. This storage tank is proposed at no less than 533,000 gallons. Tank 3 will also provide fire flow for the same homes.

4.4.4 The Location and Type of Treatment Facilities

There are no treatment facilities proposed for this project water in each well meets the minimum drinking water standards.

4.4.5 Any other Facets of the Planned Construction

A portable generator will be purchased to provide backup power for Tank 1 BPS, Big Bend BPS and one or two wells. We expect this generator to be in the range of 300 KW. This generator is exempt from air quality permitting per IDAPA 58.01.01.220.02.e.

4.4.6 How does the Drinking Water Project fit into a Regional Plan

This water system is a stand-alone system. There is no plan to merge with any other water system.

4.4.7 Schedule of Construction

Item	Estimated Completion Date
Technical Approval of FPS from DEQ	Completed August 2013, Revised January 2014
Public involvement process including advertisement, public comment period and public meeting	Completed January - February 2014
Project selection by the board	Completed February 2014
Begin environmental review and loan application	February 2014
Submit loan application and environmental review	Completed March 2014
Conclude environmental review	Completed May 2014
Loan approval	June 2014
Enter design contract with engineer	June 2014
Design and DEQ approval of design and bid documents	July 2014 to March 2015
Construction: Phase 1 — Well 7, well house, and various hydrant and valves Phase 2 — Tank 1 BPS and Tank 1, and Big Bend BPS and Tank 3, and system valves and hydrants Phase 3 — SCADA Improvements including well flowmeters, generator purchase and control improvements for generator hookup at BPS and two wells.	September 2014 to November 2015

4.5 Flow Projections

4.5.1 Operation and Maintenance

We estimated the cost for Operations and Maintenance (O&M) going forward with Alternate 13 without meters which comprises Table 9. Short-lived assets are a budgetary item in this estimate.

Table 9 – O&M Estimate of Cost with Selected Project

Item No.	Expenditures	Alt. 13 w/o Water Meters
1	Power	$188,790
2	Pump & line (not including short-lived asset replacement)	$50,000
3	Short-lived asset replacement	$20,800
4	Generator maintenance (labor, fuel, service)	$2,000
5	Labor for new wells & BPS's	$5,700
6	Insurance	$3,000
7	Accountant & part-time management	$40,000
8	Water testing	$3,600
9	Phone	$1,700
10	Taxes	$300
11	Landscaping	$6,000
12	Office & post	$3,500
Total O&M Costs		**$325,390**

We expect future costs to be less than the 2013 budget. The new BPS's and Well 7 will allow Well 3 and Well 4 more rest and thus we expect less maintenance for these systems.

4.5.2 Characterization of Residential, Commercial and Industrial Flow

The system only has residential users, thus 100 percent of flow is for single family residences. The 20 year flow projection assumes that one half of existing vacant lots will be housed. This flow (average daily) will equal 1,196 gpm. The 40 year flow projections for distribution assumes that all vacant lots will be housed. This flow (average daily) will equal 1,504 gpm. Flow projections are given in the facility planning study in Subsection 4.3.

4.6 Affected Environmental Features

4.6.1 Physical Aspects

The subdivision lies in the foothills east of the Snake River Plain southwest of Idaho Falls and Ammon. These foothills consist of silty, fine grain, loess type soils that range from shallow to several feet thick overlaying lava rock. The soils in the community are moderately erosive for the gentler slopes (0-4 percent) and highly erosive and subject to piping on steep slopes (12-30 percent). Lava rock outcroppings are visible, particularly on the slopes of steep gullies and other natural wash areas. Currently the elevation at the top of the subdivision at the community is approximately 5,525 feet. The base of the community is approximately 4,918 feet measured at Well 2. The soils in the PPPA are suitable for construction of the proposed project as long as the potential for soil erosion is checked using construction using Best Management Practices (BMP's) and long term erosion is checked using permanent BMP's at each construction site. The USDA Soil Survey for Bonneville County was consulted in drawing this conclusion and in writing this part of the report.

4.6.2 Climate

Again, the USDA Soil Survey for Bonneville County was used as a reference for this subsection. It describes the climate in the western area of Bonneville County subject to farming as 22 degrees F average winter temperature, and 66 degrees F average summer temperature with highs as much as 101 degrees F and lows as low as -33 degrees F with the mean temperature at 43 degrees F. Normal precipitation is approximately 9.35 inches, with 60 percent falling from April to September. Average seasonal snowfall is 32 inches. Relative humidity is around 40 percent in the afternoons and higher at night with around 70 percent at dawn. The sun shines 80 percent of the time in the summer and 40 percent in the winter. The prevailing wind is from the southwest. Average wind speed is highest in the spring. Winds normally vary from 0 to up to 60 mph with 20 mph common. The community sees above average winds as evidenced by the wind towers that now dominate the landscape to the east toward Willow Creek.

The prescribed building code frost depth for Bonneville County at Comore Loma is 30 inches (Carrell). The extreme frost penetration depth as reported by the National Oceanic and Atmospheric Administration Manual NOS NGS 1 is between 1.00 and 1.25 meters (3.28 to 4.10 feet). Figure 7 given in Chapter 5 is a map of the contiguous Unites States that graphically illustrates this information.

Ice can potentially develop inside of storage tanks. As long as proper management ensures that water regularly moves in and out of storage tanks, cold weather will not negatively affect the operation of storage tanks.

The climate should have no adverse affect on implementation and success of the proposed project.

4.6.3 Population

Comore Loma is a rural home subdivision that has grown parallel with the economy. When the economy is up, homes are built. When the economy is down, new homes added to the system slow. A housing boom occurred from 2003-2007. A slow down occurred after the housing market collapsed in December 2007. Only a few homes have been added since that time.

Currently there are 320 homes connected to the water system. There are no commercial, industry or institutional patron types. The 320 users are spread across three pressure zones. Zone 1 has 165 users; Zone 2 has 131; Zone 3 has 24 and Zone 4 currently has none. No water supply is currently available for 16 Zone 4 lots.

Historically, the average growth of the system has averaged eight homes per year (320 homes/40 years). The local developer has made water infrastructure available as needed to support new lots and homes. There are currently 41 lots without homes in Zone 1, 92 in Zone 2, 65 in Zone 3 and 16 in Zone 4. The latest division added to the system was Division 25 in 2007.

Even at full build out of 214 additional homes, the community will not exceed the State Environmental Review Process (SERP) criteria for excessive growth applicable to Comore Loma (500 residential units over the life of the project). New homes added to the system over the next 20 years will be built on existing available lots and on new lots yet to be developed.

Using an assumed 3.1 persons per home estimated conversion factor, current population would equal 992. We estimate that in the next 20 years, half of the vacant lots (107) will be housed. Adding these to the current number of homes equals 427 homes. Using the same population conversion factor, the number of residents in 20 years is estimated to be 1,324. The average household size in the 2010 census for Ammon was 3.05 persons; and for Bonneville County it was 2.81 persons. These data are very near the assumed estimate of 3.1 persons.

4.6.4 Economics and Social Profile

The median household income for Bonneville County is $51,254. The percentage of population below the income poverty rate in Bonneville County is 11.6 percent. This information was obtained from the US Census Bureau, American Factfinder website. The source is 2008-2012 American Community Survey 5-year estimates. The socio-economic data are given in Chapter 9. The demographic information was taken from the 2010 Census at the same website. Table 10 shows the race distribution for Bonneville County.

Table 10 — Race Distribution Chart for Bonneville County

Race	Population
White	94,411
African American	585
American Indian and Alaska Native	790
Asian	856
Native Hawaiian and Pacific Islander	86
Other	5,334
Multirace	2,172
Hispanic or Latino	11,912

This project will benefit existing homeowners, lot owners who have not yet built a home and the developer of the subdivision, who currently owns 80 lots without homes. There will be no direct benefits for the developer as they are required and have agreed to pay back a significant portion of the loan that represents the infrastructure needed to support newly developed lots. This can be seen by reviewing the user costs in Subsection 1.5 of this report. The project will enable much more reliable fire protection, better pressure at peak flow periods, and redundant sources of water supply and allow all lots in the upper

part of the community to immediately have adequate water supply and fire flow. This should improve home values and positively contribute to the quality of life.
This subdivision, by its nature, does not include any known low-income groups or minority groups of people. Each home is independently owned. The benefits of the project should accrue in a non-discriminatory manner. The corporate board has carefully crafted the loan repayment plan to ensure that beneficiaries pay a fair share.

4.6.5 Land Use

The community is solely for single family homes and is homogeneous in nature. There are no commercial or industrial enterprises. Land use in the past was for range land in the upper elevations and perhaps some dry farming. This project will not modify current land use practices.

4.6.6 Flood Plain Development

Figure 4 in Section 5 shows the subdivision boundary overlayed on top of the GIS derived FEMA flood map. This map was created from three map panels, Panel 1600270235D (effective date 04/02/2002), 1600270245C (effective date 11/04/1981) and 1600270275C (effective date 11/04/1981). The map shows a very small portion of the western edge of the community has minor risk of flooding in the 100 year flood zone in an area fed by the intermittent Rock Hollow Creek. There are no water supply facilities in the PPPA within the 100 year flood hazard zone, now or proposed as part of this project.

There are two new hydrants scheduled for replacement near the 500 year flood zone. Well 2 also lies in the 500 year flood plain. Kerry Sigman indicated in her email to us dated March 21, 2014 and located in Chapter 10 stated that because none of the proposed improvements are located in the special flood hazard area, thus there are no concerns or requirements per the minimum standards of the National Flood Insurance Program.

4.6.7 Wetlands

James Joyner of the Corps of Engineers responded by letter on March 28, 2014. This letter concluded that the community is located in uplands and that there are no waters of the United States, including wetlands, that would be affected by this project. The Corps of Engineers response letter is given in Chapter 10 of this report.

4.6.8 Wild and Scenic Rivers

There are no wild and scenic rivers in the proposed project planning area as shown on the attached list from http://www.rivers.gov/rivers/snake.php The nearest river designated as wild and scenic is the Snake River approximately eight miles east of the community. The section of the Snake River designated as wild and scenic is on the western edge of Idaho from below Hells Canyon Dam which is hundreds of miles down steam of the proposed project. Thus there will be no effect to wild and scenic rivers.

4.6.9 Cultural resources

SHPO sent a letter to us dated March 6, 2014, stating that in order to be in compliance with the National Historic Preservation Act that a survey be conducted to identify any historic properties, evaluate effects, and propose mitigation if warranted. They asked us to survey the portions of the project involving removal and replacement of Tank 1, the installation of the water transmission line to proposed Tank 3 and the location of Tank 3.

After further discussion with them, the proposed buried power supply line to be laid parallel to and adjacent to the waterline from Well 4 to Tank 1 was also included. The Shoshone-Bannock Tribes also requested an archeological survey in their letter to DEQ dated March 21, 2014 and other items including legal description and land ownership. These were provided to the tribe via DEQ. The Shoshone-Paiute Tribes never responded to DEQ's original letter requesting comment.

A historical report was promptly prepared for Schiess & Associates by Cultural Resource Consulting, dated March 27, 2014 and submitted to the Idaho SHPO and to DEQ on the same day. DEQ then forwarded a copy of the report to the Shoshone-Bannock Tribes.

This report found no cultural materials to document and no previously recorded properties within the surveyed area and indicated there should be no direct effect to cultural properties. On March 28, 2014, the SHPO concurred with the report findings.

The Shoshone-Bannock Tribes gave no formal response to the findings and recommendations given in the historical report.

The historical report and related correspondence from DEQ, the Shoshone-Bannock Tribes and SHPO with the no effect determination are given in Chapter 10 of this report.

4.6.10 Flora and Fauna

Animal and plant life is typical of foothills east of Idaho Falls. Foothills are covered with sagebrush and other common flora to this area. Much of the area would be considered rangeland prior to development. Low lying areas and gullies may have brushy woody plants. Wildlife habitat would consist of coyote, fox, rabbit, pheasant, chukar/partridge, grouse, doves and birds of prey, an occasional couger and other lesser known faunas. Big game would include deer and an occasional presence of moose and elk.

A memo sent from DEQ to Schiess & Associates dated March 7, 2014 stated that the proposed project would have no effect on the following species: Canada Lynx, Greater Sage-Grouse, Grizzly Bear, North American Wolverine, Whitebark Pine, Ute Ladies' Tresses, Yellow-billed Cuckoo and the Essential Fish Habitat. The memo and attachments that include correspondence with the United States Dept. of Interior/Fish and Wildlife Service and the lack of essential fish habitat documentation are given in Chapter 10 of this report.

4.6.11 Recreation and Open Space

The subdivision is a rural single home neighborhood homogeneous in nature. There are no parks or recreational facilities or common areas associated with the development. The project does not contemplate modifying the subdivision for recreational use. Therefore this project will have no effect on recreation and open space.

4.6.12 Agricultural Lands

The proposed project does not affect any important farmland because there is no prime farmland located in the area of potential effect.

4.6.13 Air Quality

With the rural nature of the subdivision, air quality is normally affected by spring and summer windstorms that carry dust from range and farm lands and smoky air typical of summer and fall from nearby and far away range and forest fires. There is little noise concern in this area.

A concern arose for DEQ regarding the portable generator to be purchased as part of this project. After further review with Rensay Owen of the Idaho Falls Regional office , this generator is exempt from permitting under IDAPA 58.01.01 due to its portability.

This project will have no effect on air quality providing that short-term measures (BMP's) are implemented during construction. Control of fugitive dust is required under Idaho law. Additionally, construction debris and other wastes are strictly prohibited from open burning and must be accumulated and disposed in a licensed landfill. Correspondence from DEQ regarding air quality issues is given in Chapter 10 of this report.

4.6.14 Energy

The subdivision is only a consumer of energy. Water use in the community is approximately four to five times that of water systems on the valley floor. The high sprinkler irrigation use on lawns requires high amounts of energy use in the summer to run system pumps. High water use is due to the irrigation of large yards for aesthetics and protection against the threat of range fires within the development and on its outer edges.

The Water Corporation is planning to incorporate into each pump station natural light, high efficiency lighting, high efficiency wood trusses, high efficiency motors and pumps and VFD's to reduce energy consumption and piping wear and tear. Cyndi Grafe, in her email to the Schiess & Associates clerk dated February 25, 2014 gave information regarding sustainability. Her email is included in the Chapter 10 agency responses.

4.6.15 Regionalization

Regionalization of this community is not considered practical, per the Comore Loma Facility Planning Study, Subsection 5.4 dated January, 2014. The reasons why regionalization with Blackhawk Subdivision (to the south) or the City of Ammon (to the north) are not feasible include the following: cultural differences (Ammon), pressure zone elevation differences (Ammon and Blackhawk) and geographical barriers. There is a canyon that divides Ammon from Comore Loma and a Canyon that divides Blackhawk from Comore Loma. There are also political considerations. All of these reasons and associated physical and legal costs to join together act as deterrents that cannot be overcome.

4.6.16 Water Quality

There is no perennial stream that flows through the current subdivision boundaries. However, due to the steep nature and undulating hills and gullies in the development, natural drainages exist and may actively run for brief periods during spring snowmelt and after heavy rainstorms.

The system water sources are entirely groundwater. Wells in the area are deep and range from 295 feet deep at Well 2 to 520 feet deep at Well 5. A test well for Well 7 drilled near

Tank 2 on High Willow Drive was drilled to 730 feet with water found at the bottom of the hole. The DEQ source water assessment documents available on the DEQ switchboard for Comore Loma describes the groundwater zone of influence feeding each well as pie slices approximately one mile long and a half mile wide at the end extending to the east northeast of Comore Loma. The wells are near the boundary of the Snake Plain Aquifer. Well 6, by the source water assessment document, appears to draw its water from a very large, thin pie slice north of the development several miles extending north of Iona and into the Snake River Plain.

The Eastern Idaho Health District raised a concern that Well 7 may be too close to the drainfield and septic system of the neighboring home. A more detailed review of the homesite and well location assured us that the septic tank and drainfield is well outside the 100 foot minimum standard. The initial health district review letter and our follow-up response to the health district are included in the Chapter 10 responses. No further comments were received from the health district.

In an email to the Schiess & Associates clerk dated February 21, 2014, Susan Eastman from the EPA stated that the project will not have a significant adverse impact on the Eastern Snake River Plain Aquifer. The Susan Eastman email is included in the Chapter 10 responses. In addition to Susan Eastman, Cyndi Grafe from the EPA also responded concerning the East Snake River Plain Aquifer. She provided a GIS map of the aquifer zoomed in closer to the subject area but still encompassing much of Eastern Idaho. This map is given with her response in Chapter 10. The Schiess & Associates produced GIS map labeled Figure 5 given in Chapter 5 gives a close up view of the aquifer boundary relative to location of the community. The entire East Snake Plain Aquifer is given on the EPA map labeled Figure 5a in Chapter 5. The checklist sent to Susan Eastman prepared by Schiess & Associates that Susan Eastman used to make her determination is appropriately included in Chapter 10 under the list of agencies consulted.

5.0 MAPS, CHARTS AND TABLES

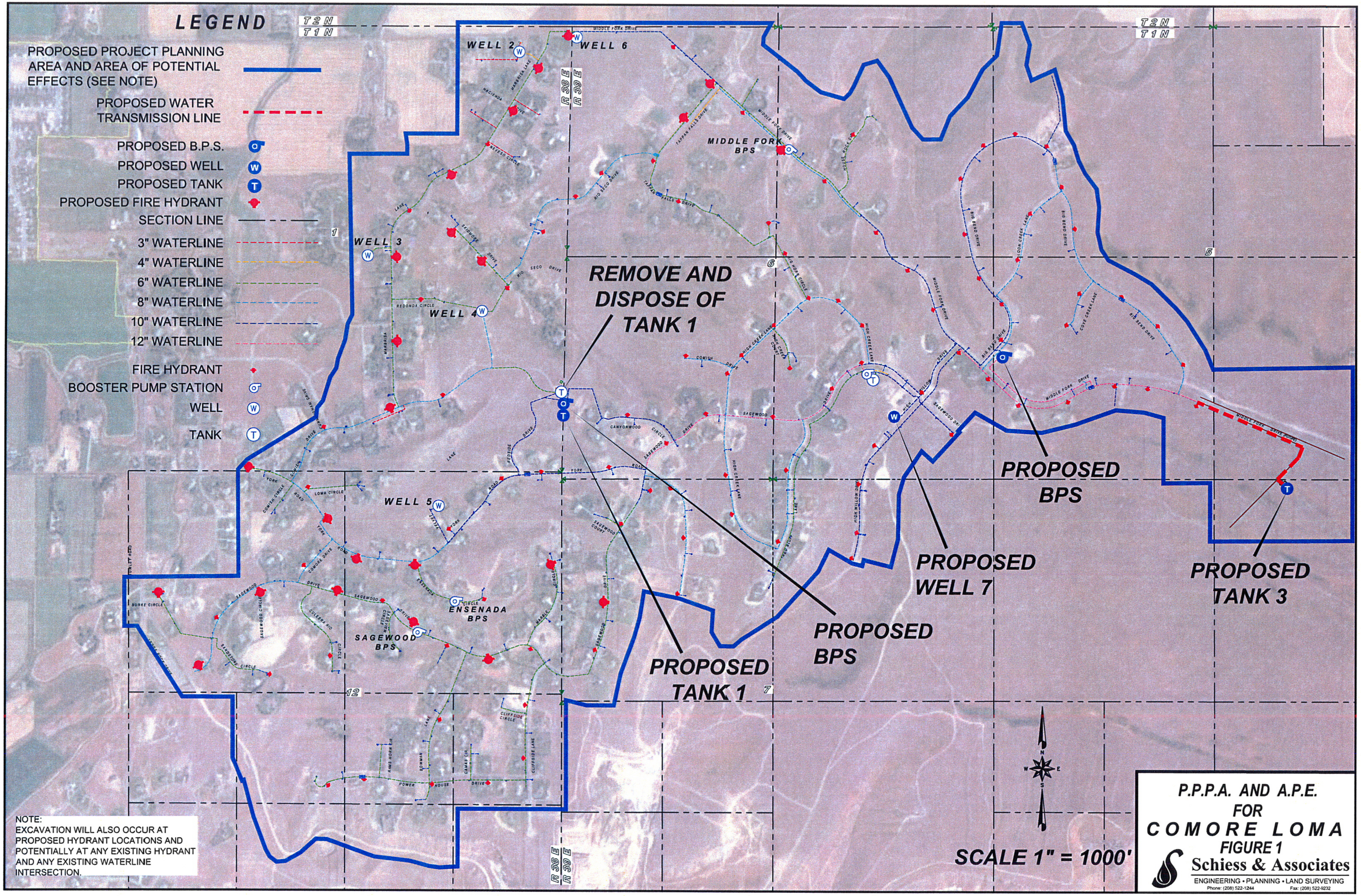
The following figures are attached as follows:

- Figure 1 - PPPA and APE
- Figure 2 - Topographical Map
- Figure 3 - Soils Map
- Figure 4 - Flood Plain
- Figure 5 - Location of Subdivision Relative to the Snake River Plain Aquifer
- Figure 5a – Designated Sole Source Aquifers in EPA Region X
- Figures 6a, 6b & 6c - Locations of all areas included in the historical walkover
- Figure 7 – Extreme Depth of Frost Penetration in Meters

The following Tables are attached as follows:

- Table 11 - Costs to Mitigate Environmental Impacts - Alternative's 11 & 13 with and without meters

All other tables and figures are in the text as per the List of Tables and Figures listed at the beginning of the report.


LEGEND
PROPOSED PROJECT PLANNING AREA AND AREA OF POTENTIAL EFFECTS (SEE NOTE)
PROPOSED WATER TRANSMISSION LINE
PROPOSED B.P.S.
PROPOSED WELL
PROPOSED TANK
PROPOSED FIRE HYDRANT
SECTION LINE
3" WATERLINE
4" WATERLINE
6" WATERLINE
8" WATERLINE
10" WATERLINE
12" WATERLINE
FIRE HYDRANT
BOOSTER PUMP STATION
WELL
TANK
T2N
T1N
R 38 E
R 39 E
WELL 2
WELL 6
WELL 3
WELL 4
WELL 5
MIDDLE FORK BPS
ENSENADA BPS
SAGEWOOD BPS
REMOVE AND DISPOSE OF TANK 1
PROPOSED BPS
PROPOSED WELL 7
PROPOSED BPS
PROPOSED TANK 1
PROPOSED TANK 3
1
5
6
7
12
NOTE:
EXCAVATION WILL ALSO OCCUR AT PROPOSED HYDRANT LOCATIONS AND POTENTIALLY AT ANY EXISTING HYDRANT AND ANY EXISTING WATERLINE INTERSECTION.
SCALE 1" = 1000'
P.P.P.A. AND A.P.E. FOR COMORE LOMA
FIGURE 1
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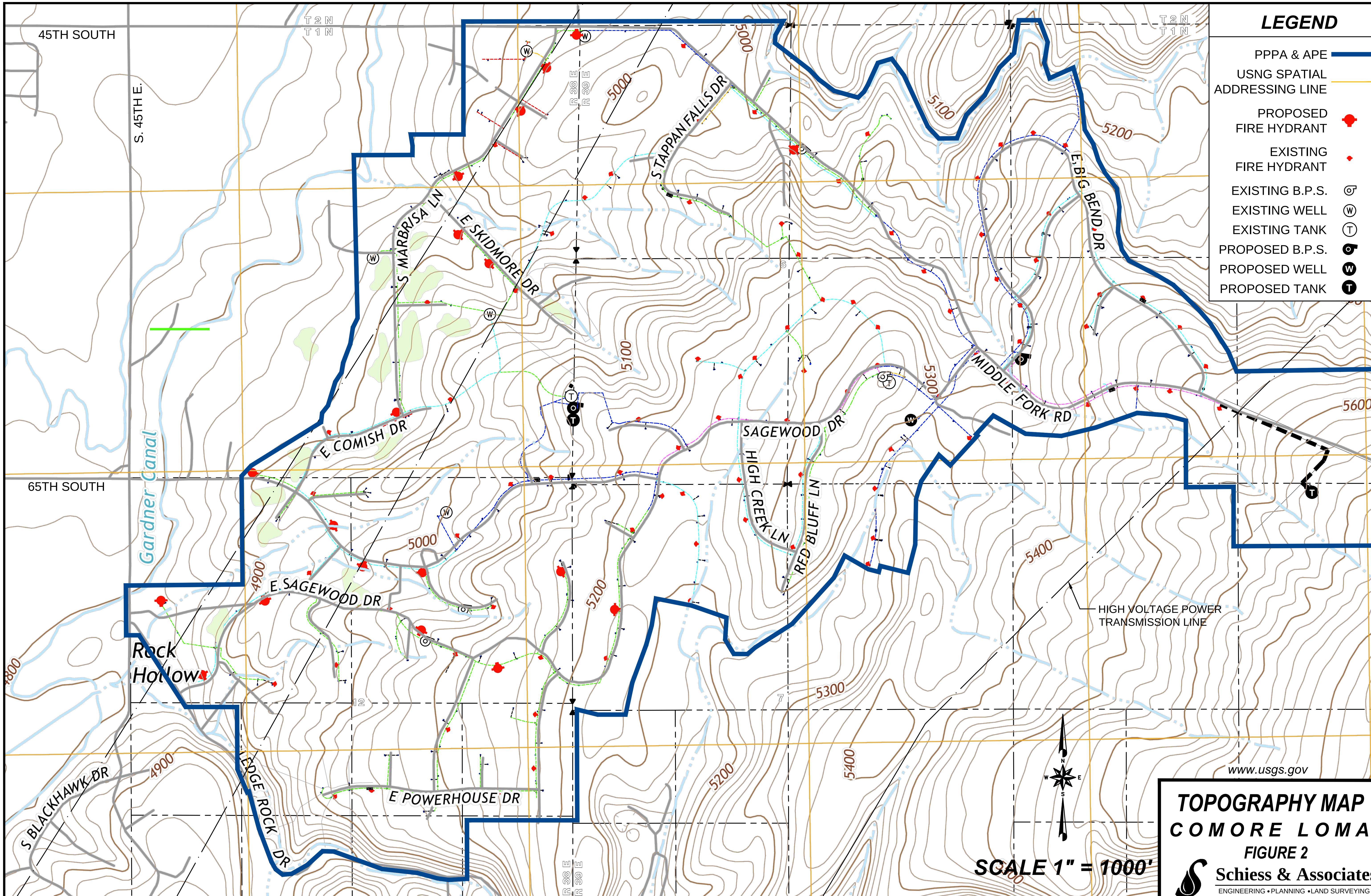
LEGEND
PPPA & APE
USNG SPATIAL ADDRESSING LINE
PROPOSED FIRE HYDRANT
EXISTING FIRE HYDRANT
EXISTING B.P.S.
EXISTING WELL
EXISTING TANK
PROPOSED B.P.S.
PROPOSED WELL
PROPOSED TANK
45TH SOUTH
65TH SOUTH
S. 45TH E.
Gardner Canal
T 2 N
T 1 N
R 38 E
R 39 E
S MARBRISA LN
E SKIDMORE DR
S TAPPAN FALLS DR
E. BIG BEND DR
MIDDLE FORK RD
SAGEWOOD DR
HIGH CREEK LN
RED BLUFF LN
E COMISH DR
E. SAGEWOOD DR
E POWERHOUSE DR
LEDGE ROCK DR
S BLACKHAWK DR
Rock Hollow
HIGH VOLTAGE POWER TRANSMISSION LINE
4900
5000
5100
5200
5300
5400
5600
www.usgs.gov
SCALE 1" = 1000'
TOPOGRAPHY MAP
COMORE LOMA
FIGURE 2
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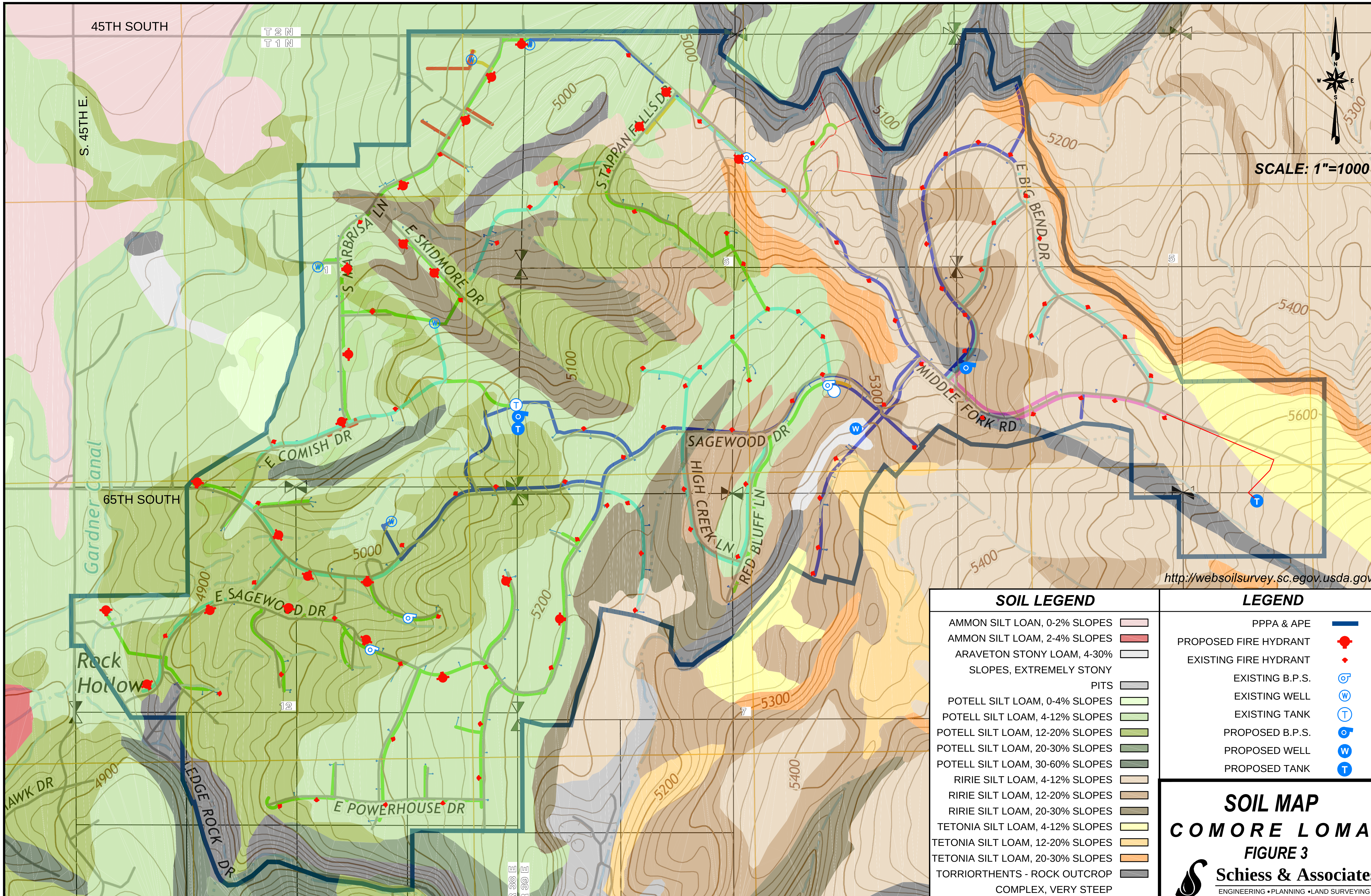
45TH SOUTH
T 2 N
T 1 N
S. 45TH E.
5000
S TAPPAN FALLS DR
5100
5200
E BIG BEND DR
5300
SCALE: 1"=1000'
S MARBRISA LN
E SKIDMORE DR
6
5
5400
MIDDLE FORK RD
5600
E COMISH DR
SAGEWOOD DR
HIGH CREEK LN
RED BLUFF LN
65TH SOUTH
Gardner Canal
4900
E SAGEWOOD DR
Rock Hollow
12
7
E POWERHOUSE DR
EDGE ROCK DR
HAWK DR
R 38 E
R 39 E
http://websoilsurvey.sc.egov.usda.gov
SOIL LEGEND
AMMON SILT LOAM, 0-2% SLOPES
AMMON SILT LOAM, 2-4% SLOPES
ARAVETON STONY LOAM, 4-30% SLOPES, EXTREMELY STONY
PITS
POTELL SILT LOAM, 0-4% SLOPES
POTELL SILT LOAM, 4-12% SLOPES
POTELL SILT LOAM, 12-20% SLOPES
POTELL SILT LOAM, 20-30% SLOPES
POTELL SILT LOAM, 30-60% SLOPES
RIRIE SILT LOAM, 4-12% SLOPES
RIRIE SILT LOAM, 12-20% SLOPES
RIRIE SILT LOAM, 20-30% SLOPES
TETONIA SILT LOAM, 4-12% SLOPES
TETONIA SILT LOAM, 12-20% SLOPES
TETONIA SILT LOAM, 20-30% SLOPES
TORRIORTHENTS - ROCK OUTCROP COMPLEX, VERY STEEP
LEGEND
PPPA & APE
PROPOSED FIRE HYDRANT
EXISTING FIRE HYDRANT
EXISTING B.P.S.
EXISTING WELL
EXISTING TANK
PROPOSED B.P.S.
PROPOSED WELL
PROPOSED TANK
SOIL MAP
COMORE LOMA
FIGURE 3
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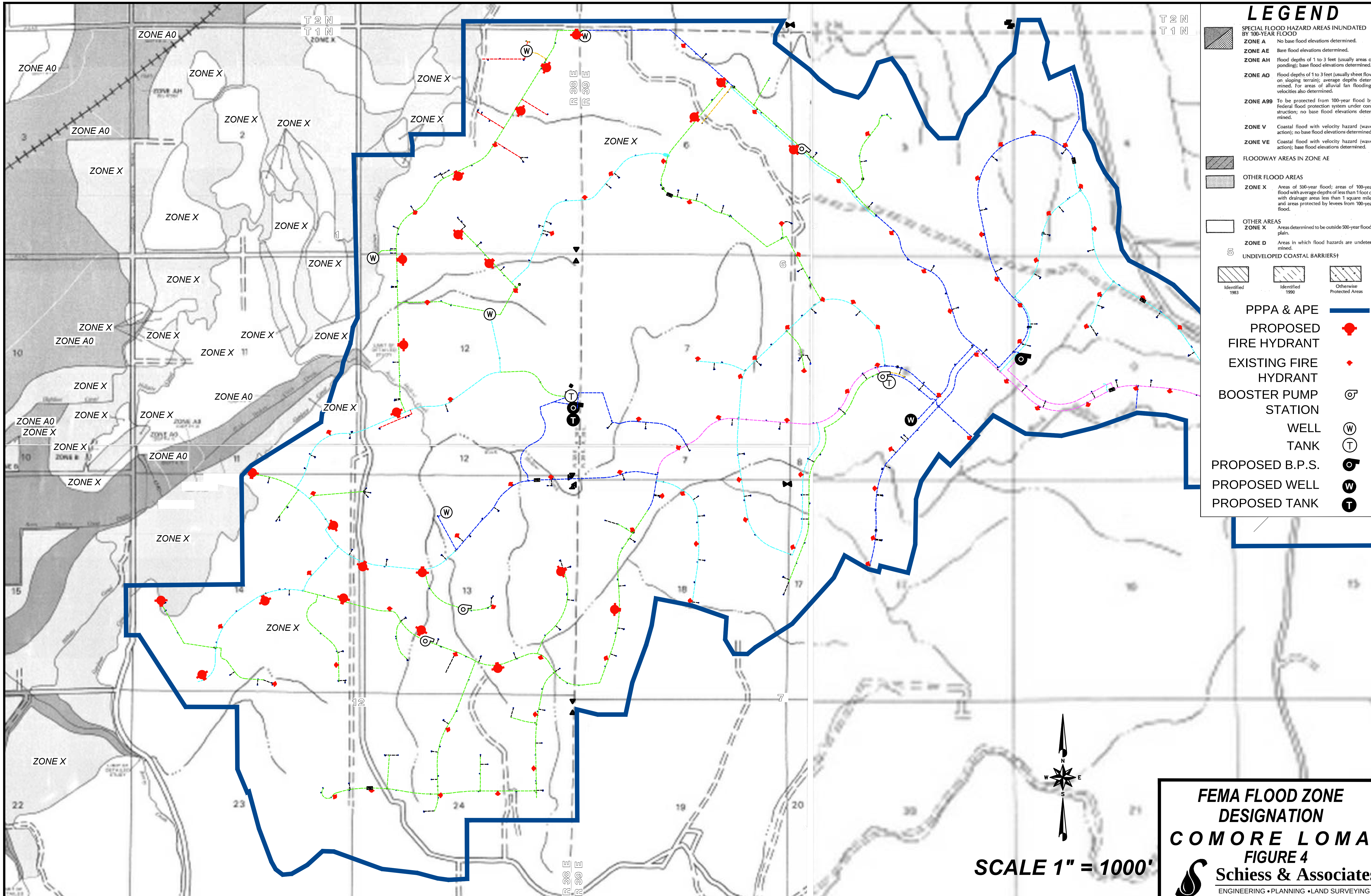
Fax: (208) 522-9232



LEGEND
SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD
ZONE A No base flood elevations determined.
ZONE AE Base flood elevations determined.
ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding; velocities also determined.
ZONE A99 To be protected from 100-year flood by Federal flood protection system under construction; no base flood elevations determined.
ZONE V Coastal flood with velocity hazard (wave action); no base flood elevations determined.
ZONE VE Coastal flood with velocity hazard (wave action); base flood elevations determined.
FLOODWAY AREAS IN ZONE AE
OTHER FLOOD AREAS
ZONE X Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.
OTHER AREAS
ZONE X Areas determined to be outside 500-year floodplain.
ZONE D Areas in which flood hazards are undetermined.
UNDEVELOPED COASTAL BARRIERS†
Identified 1983
Identified 1990
Otherwise Protected Areas
PPPA & APE
PROPOSED FIRE HYDRANT
EXISTING FIRE HYDRANT
BOOSTER PUMP STATION
WELL
TANK
PROPOSED B.P.S.
PROPOSED WELL
PROPOSED TANK
T 2 N
T 1 N
R 38 E
R 39 E
ZONE AO
ZONE X
SCALE 1" = 1000'
FEMA FLOOD ZONE DESIGNATION
COMORE LOMA
FIGURE 4
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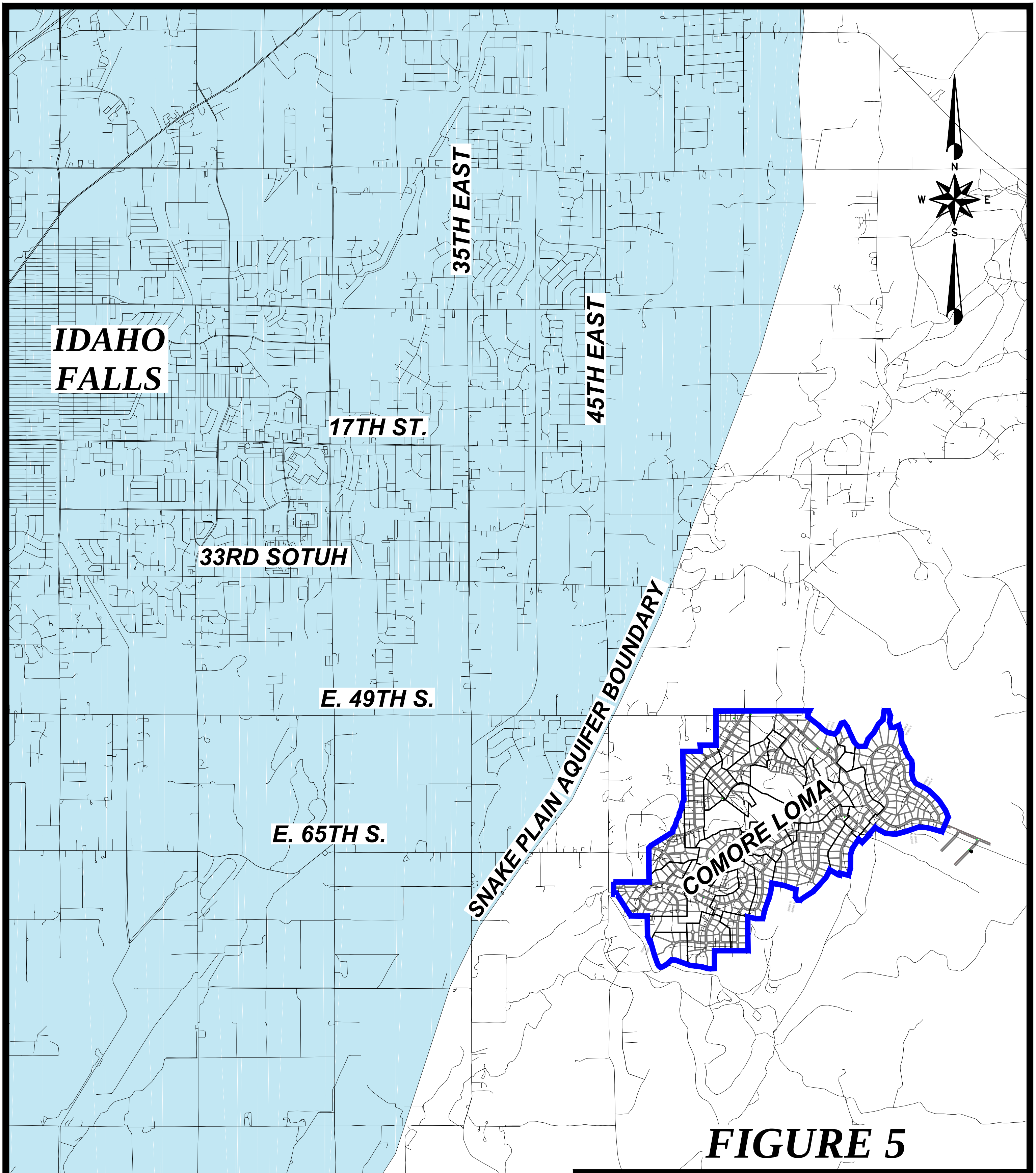

FIGURE 5

COMORE LOMA

Snake Plain Aquifer Boundary

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Idaho Falls 522-1244 Rexburg 356-6092

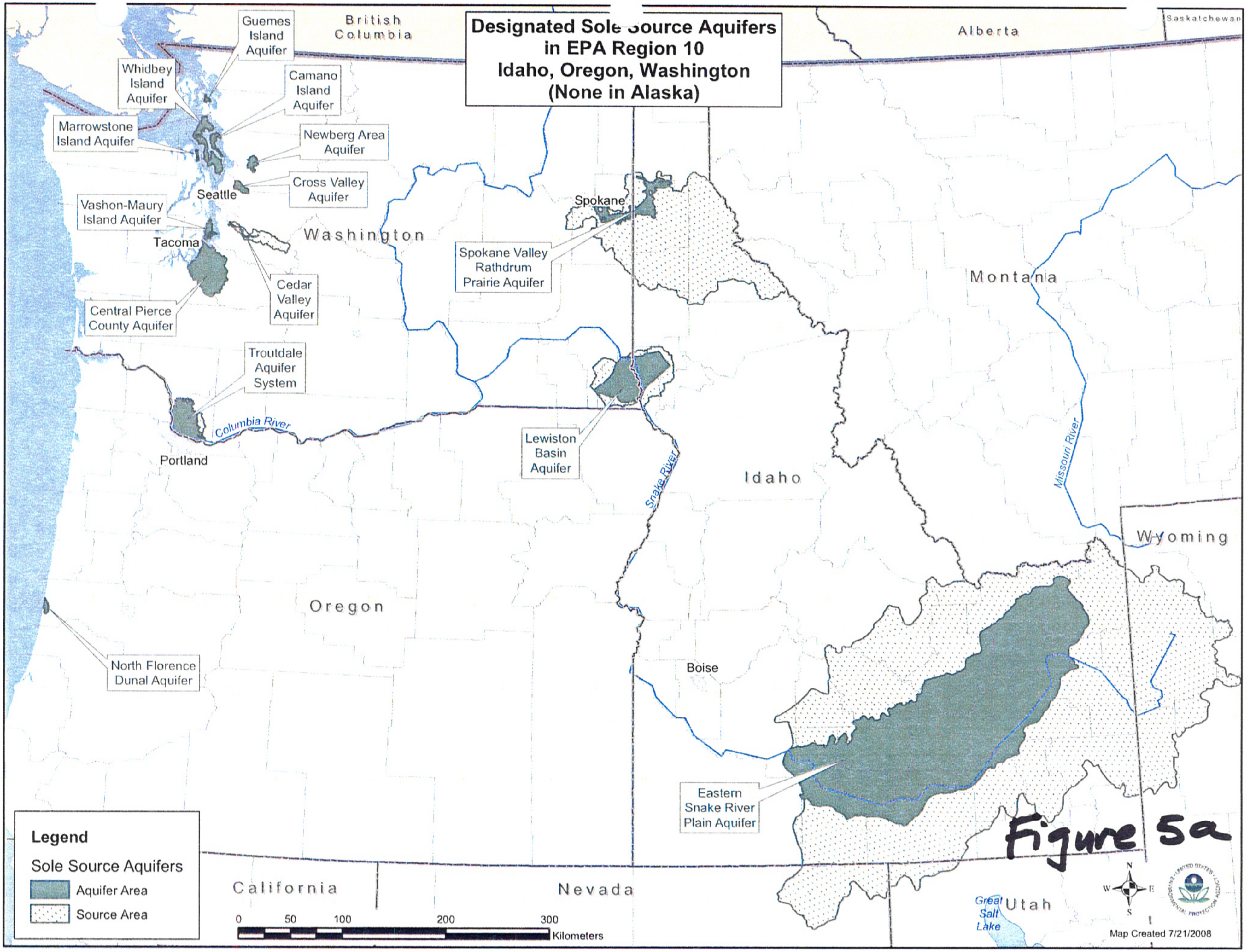

Designated Sole Source Aquifers
in EPA Region 10
Idaho, Oregon, Washington
(None in Alaska)
British Columbia
Alberta
Saskatchewan
Guemes Island Aquifer
Whidbey Island Aquifer
Camano Island Aquifer
Marrowstone Island Aquifer
Newberg Area Aquifer
Cross Valley Aquifer
Seattle
Vashon-Maury Island Aquifer
Tacoma
Washington
Cedar Valley Aquifer
Central Pierce County Aquifer
Spokane
Spokane Valley Rathdrum Prairie Aquifer
Montana
Troutdale Aquifer System
Columbia River
Portland
Lewiston Basin Aquifer
Snake River
Idaho
Missouri River
Wyoming
Oregon
North Florence Dunal Aquifer
Boise
Eastern Snake River Plain Aquifer
Legend
Sole Source Aquifers
Aquifer Area
Source Area
California
Nevada
Utah
Great Salt Lake
0 50 100 200 300 Kilometers
Map Created 7/21/2008

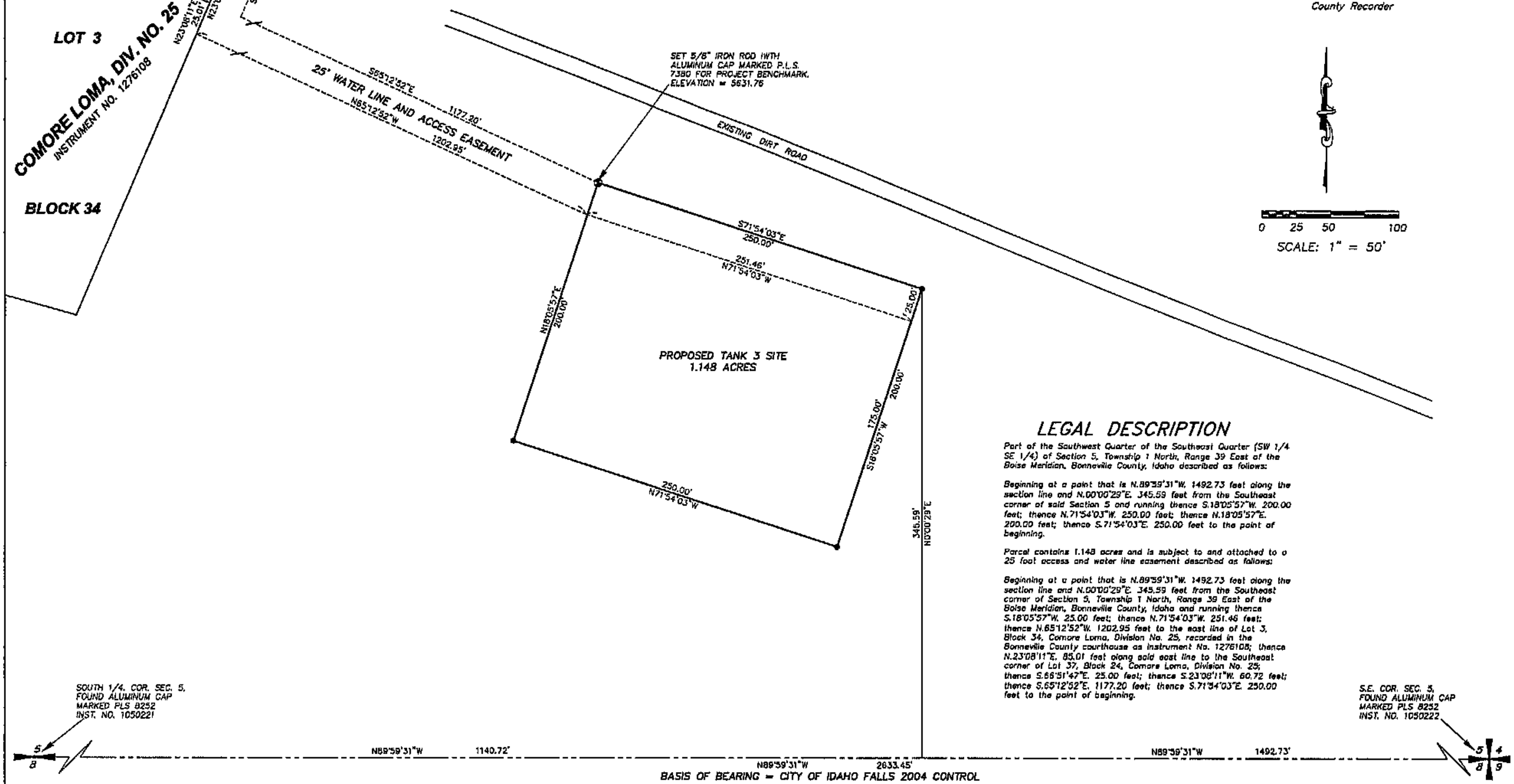
Figure 5a

PART OF
THE SW 1/4 OF THE SE 1/4 OF SECTION 5, T. 1 N., R. 39 E.B.M., BONNEVILLE COUNTY, IDAHO

RECORDER'S CERTIFICATE

Instrument No. ____________
Time of Day ____________
Date ____________
Recorded in Bonneville County, Idaho

____
County Recorder



LEGAL DESCRIPTION

Part of the Southwest Quarter of the Southeast Quarter (SW 1/4 SE 1/4) of Section 5, Township 1 North, Range 39 East of the Boise Meridian, Bonneville County, Idaho described as follows:

Beginning at a point that is N.89°59'31"W. 1492.73 feet along the section line and N.00°00'29"E. 345.59 feet from the Southeast corner of said Section 5 and running thence S.18°05'57"W. 200.00 feet; thence N.71°54'03"W. 250.00 feet; thence N.18°05'57"E. 200.00 feet; thence S.71°54'03"E. 250.00 feet to the point of beginning.

Parcel contains 1.148 acres and is subject to and attached to a 25 foot access and water line easement described as follows:

Beginning at a point that is N.89°59'31"W. 1492.73 feet along the section line and N.00°00'29"E. 345.59 feet from the Southeast corner of Section 5, Township 1 North, Range 39 East of the Boise Meridian, Bonneville County, Idaho and running thence S.18°05'57"W. 25.00 feet; thence N.71°54'03"W. 251.46 feet; thence N.65°12'52"W. 1202.95 feet to the east line of Lot 3, Block 34, Comore Loma, Division No. 25, recorded in the Bonneville County courthouse as Instrument No. 1276108; thence N.23°08'11"E. 85.01 feet along said east line to the Southeast corner of Lot 37, Block 24, Comore Loma, Division No. 25; thence S.66°51'47"E. 25.00 feet; thence S.23°08'11"W. 60.72 feet; thence S.65°12'52"E. 1177.20 feet; thence S.71°54'03"E. 250.00 feet to the point of beginning.

LEGEND

- Section corner control.
- Placed 1/2" x 24" iron rod with yellow plastic cpp marked P.L.S. 7380.
- Placed 5/8" x 30" iron rod with aluminum cap mark P.L.S. 7380 for benchmark.

Elevation datum: NAVD88.

SURVEYOR'S CERTIFICATE

I, Terry R. Meppen, a Registered Professional Land Surveyor in the State of Idaho do hereby certify that this plat is an accurate representation of the survey completed under my supervision.

Terry R. Meppen
License No. 7380

PROFESSIONAL LAND SURVEYOR
REGISTERED
7380
STATE OF IDAHO
TERRY R. MEPPEN

Date

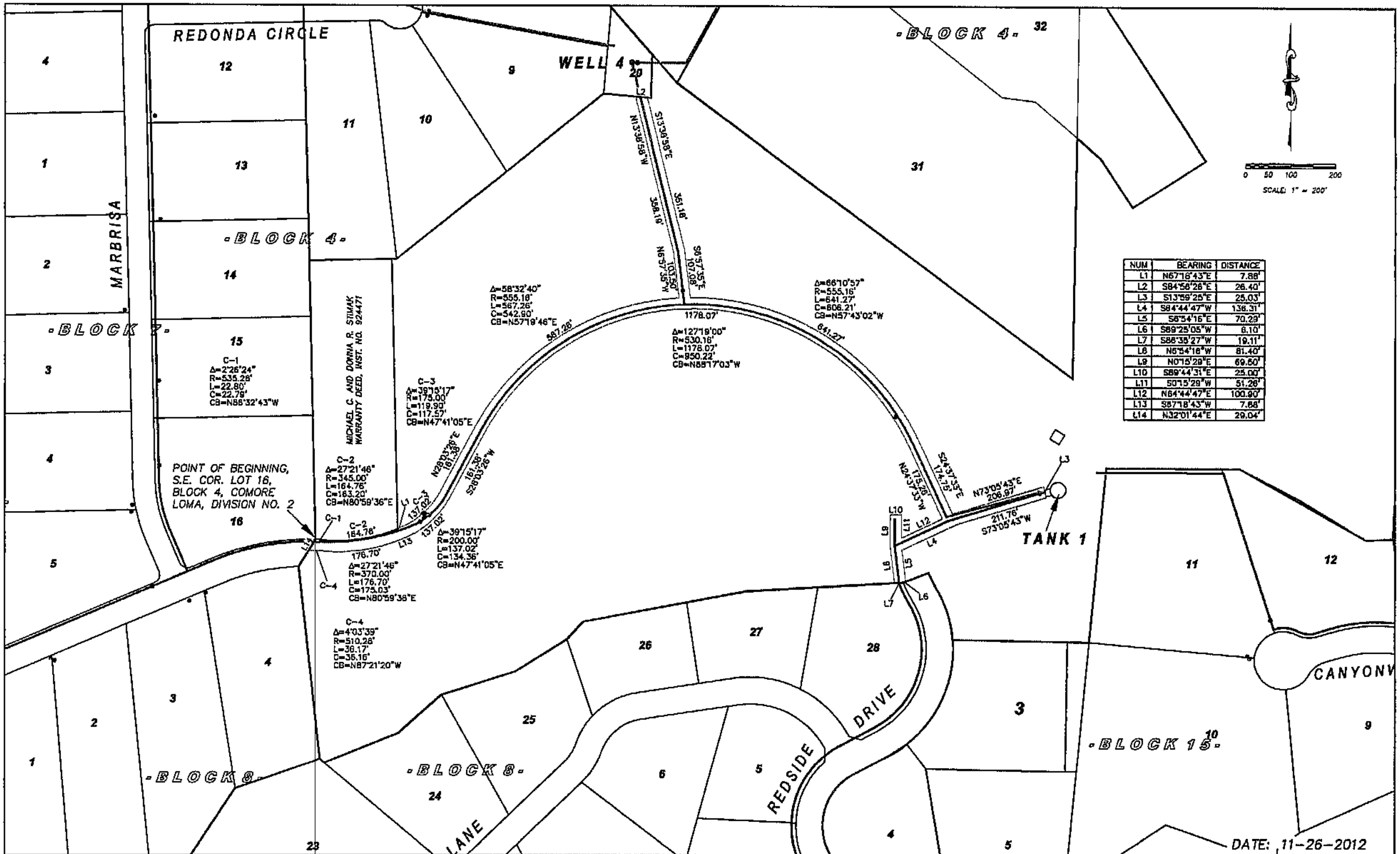
RECORD OF SURVEY

BENCHMARK LAND SURVEYING
(208) 313-2458

STONEWOOD INVESTMENTS LLC
SEC. 5, T. 1 N., R 39 E.B.M.

DATE: 3-17-2014	789 NORTH 450 EAST	SHEET 1	
DESIGN:	FIRTH, IDAHO 83236	OF 1	
DRAWN: T.R.M.	tmeppen@gmail.com		
PROJECT NO. 14040			
REVISION:			

Figure 6a



NUM	BEARING	DISTANCE
L1	N67°18'43"E	7.88'
L2	S84°58'26"E	26.40'
L3	S13°59'25"E	25.03'
L4	S84°44'47"W	136.31'
L5	S6°54'16"E	70.29'
L6	S89°25'05"W	6.10'
L7	S88°35'27"W	19.11'
L8	N6°54'16"W	81.40'
L9	N0°15'29"E	69.60'
L10	S89°44'31"E	25.00'
L11	S0°15'29"W	51.26'
L12	N84°44'47"E	100.90'
L13	S87°18'43"W	7.88'
L14	N32°01'44"E	29.04'

NO.	REVISIONS	BY	DATE

This document or any part thereof in detail or design concept is the property of Schiess & Associates and shall not be copied in any form without the written authorization of Schiess & Associates.

DRAWN: TRM | CHECKED: PHS
DESIGNED: TRM | APPROVED: PHS
CAD NAME: 12071 | HORZ. SCALE: 1"=200' | VERT. SCALE: N/A

Schiess & Associates
CONSULTING ENGINEERS

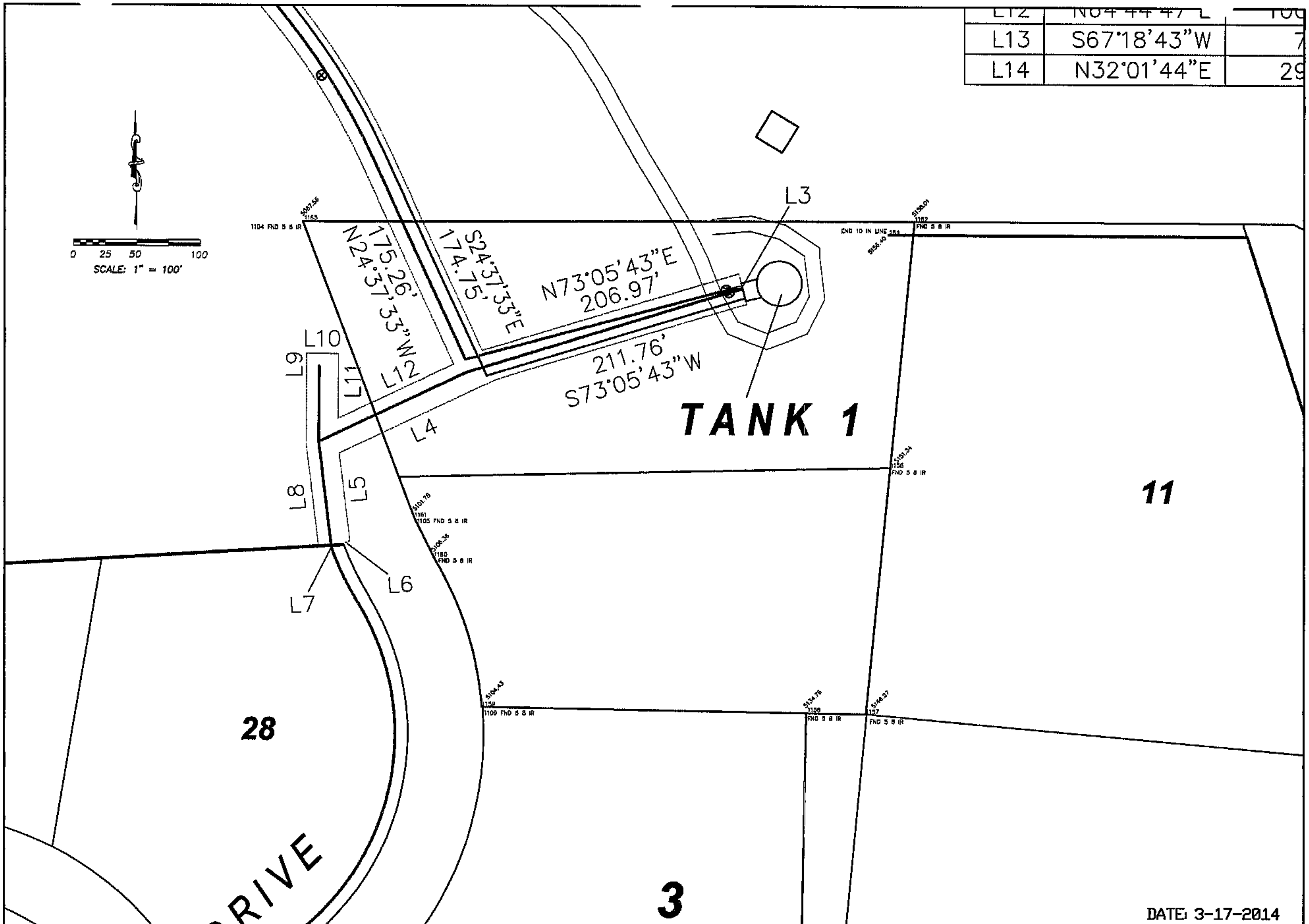
COMORE LOMA

25' WATER LINE EASEMENT
COMORE DEVELOPMENT INC.

PROJECT NO. 12071
SHEET NO. 1

Figure 6b

L12	N64°44'47"E	10[illegible]
L13	S67°18'43"W	7[illegible]
L14	N32°01'44"E	29[illegible]



DATE: 3-17-2014

DRAWN: TRM	CHECKED: TRM	(208) 313-2458	SURVEY	BONNEVILLE COUNTY	PROJECT NO. 14040
DESIGNED: TRM	APPROVED: TRM	BENCHMARK LAND SURVEYING	FOR	TANK NO. 1	SHEET NO. 1
CAD NAME: 14040	HORZ. SCALE: 1"=100' VERT. SCALE: N/A	789 N 450 E, FIRTH, IDAHO 83236 tmeppen@gmail.com	COMORE LOMA		

NO. REVISIONS BY DATE

Figure 6c

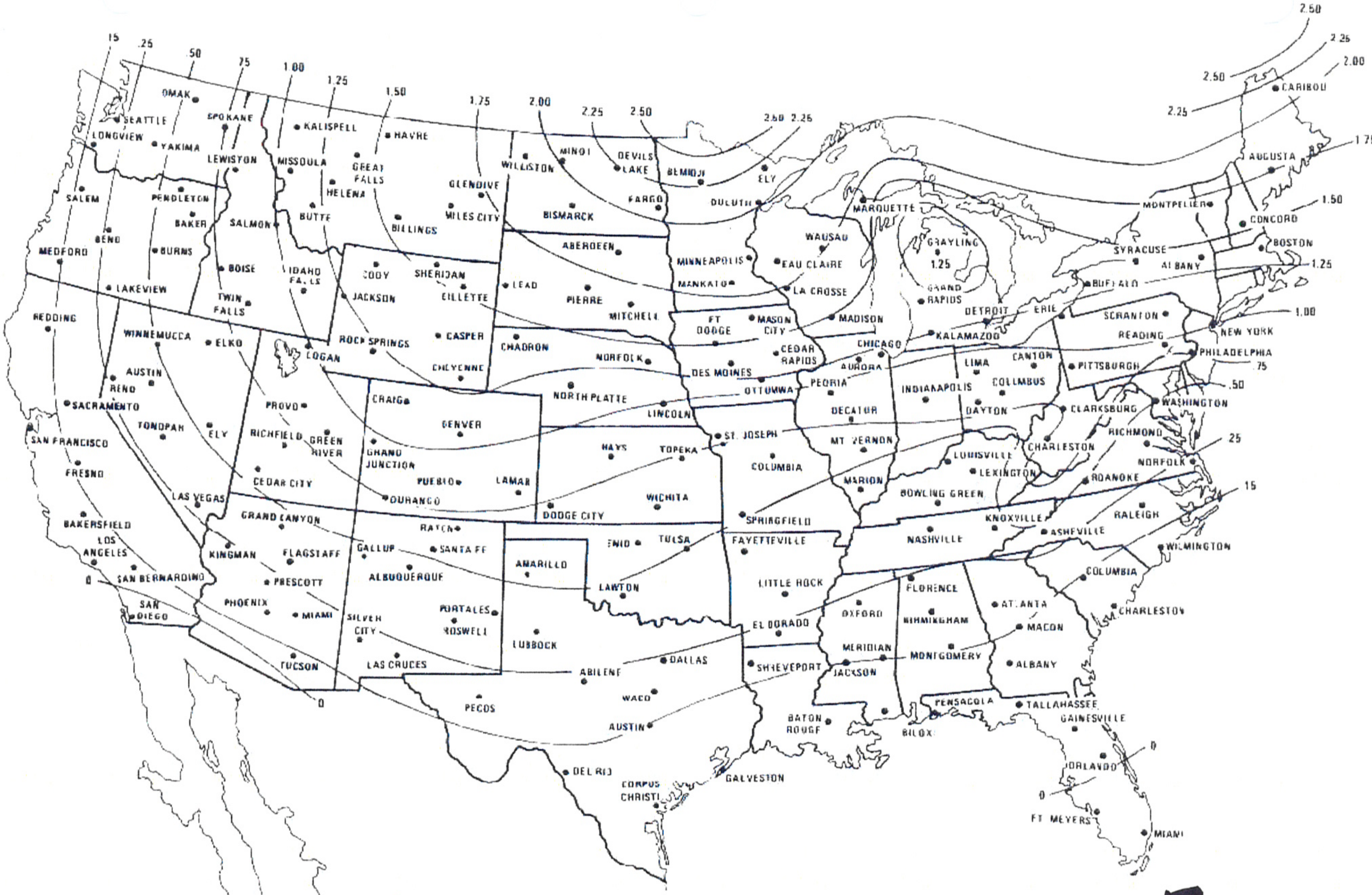


Figure 13 - Extreme depth of Frost Penetration in meters.

Figure 7

From NOAA Manual NOS NGS1, Geodetic Bench Marks, Lt. Richard P. Floyd NOAA Corps, National Geodetic Survey, Rockville, MD, September, 1978, Pg. 34

Table 11 - Costs to Mitigate Environmental Impacts - Alternative's 11 & 13 with and w/o meters

No.	Environmental Considerations	Effects?	Alternatives 11 w/o meters	11 w/meters	13 w/o meters	13 w/meters
1	Physical Aspects	Implement construction erosion control techniques and design building sites to prevent erosion	$4,000	$8,000	$6,000	$10,000
2	Climate	NA	0	0	0	0
3	Population	NA	0	0	0	0
4	Economics and Social Profile	The patrons voted to proceed with the understanding that costs would be very high compared costs at nearby water systems	0	0	0	0
5	Land Use	NA	0	0	0	0
6	Floodplain	NA	0	0	0	0
7	Wetlands	NA	0	0	0	0
8	Wild and Scenic Rivers	NA	0	0	0	0
9	Cultural Resources	Contraction team be on watch for cultural resources	0	0	0	0
10	Flora and Fauna	NA	0	0	0	0
11	Recreation and Open Space	NA	0	0	0	0
12	Ag Lands	NA	0	0	0	0
13	Air Quality	Control fugitive dust during construction	$14,000	$22,000	$14,000	$22,000
		Avoid burning of construction waste	$3,000	$4,000	$4,000	$5,000
14	Energy	VFD's and high efficiency pumps will be utilized. Buildings will be designed with energy efficiency in mind.	0	0	0	0
15	Regionalization	NA	0	0	0	0
16	Water Quality	Implement construction stormwater BMP's during construction	$7,000	$8,000	$10,000	$11,000
Total			**$28,000**	**$42,000**	**$34,000**	**$48,000**

6.0 ENVIRONMENTAL IMPACTS OF PROPOSED PROJECT

6.1 Impacts on Human-Made and Natural Features

The direct, indirect, short-term, long-term and cumulative impacts of the project upon human-made and natural features were described on Table 6 in Subsection 3.3.2 and Chapter 4. Only the environmental elements with possible impacts are discussed in this subsection.

6.1.1 Physical Aspects

The soils are suitable for construction.

6.1.2 Population

Growth in the community will not exceed the SERP criteria for excessive growth applicable to Comore Loma. Less than 500 new units are expected to be added as a result of this project.

6.1.3 Economics and Social Profile

No impacts are expected. The project benefits should accrue in a non-discriminatory and equitable manner.

6.1.4 Land Use

This project will not adversely modify present land use practices within the development.

6.1.5 Floodplain Development

Although a very small portion of the PPPA is within the 100 year floodplain no construction is planned near this area. No improvements will be located near the special flood hazard area. Proposed improvements meet minimum standards to the National Flood Insurance Program.

6.1.6 Cultural Resources

The field investigative report required by the SHPO found no cultural materials to document and no previously recorded properties within the APE; thus there should be no direct effect to cultural properties. The Shoshone-Bannock Tribe didn't respond once they received a copy of the field investigative report. No response to our original inquiry was obtained from the Shoshone-Piaute Tribes.

6.1.7 Air Quality

Air quality could be diminished during construction if construction BMP's are not implemented for dust control.

6.1.8 Energy

The use of energy is high when compared to neighboring communities, due in part to the large elevation range of the users. As the system approaches the design capacity energy use will increase.

6.1.9 Water Quality

Well water quality is good. Adding a well at either the designated spot for Well 7 or near proposed Tank 1 should not impair water quality if Idaho well construction rules are followed.

6.2 Potential or Existing Impacts

There are potential impacts that could result by implementing this project. There appears to be very little existing impact that would persist with the implementation of this project after the project is built. The environmental elements with potential or existing impacts are listed below.

6.2.1 Physical Aspects

Soil erosion must be monitored and controlled to eliminate possible impacts.

6.2.2 Floodplain

There are two hydrants planned for installation near the 500 year floodplain boundary. These hydrants have functioned well since installation and should not be adversely affected due to the 500 year floodplain. Well 2 is located in the 500 year floodplain boundary.

6.2.3 Cultural Resources

It is possible that cultural properties could be discovered during construction. A means of halting construction and investigating the discovery to minimize damage and protect the finding is needed.

6.2.4 Air Quality

Dust control must be monitored and controlled during construction utilizing construction BMP's. Burning of construction wastes will not be allowed.

6.2.5 Energy

Water conservation will have to occur to enable the proposed facilities to function well for the design capacity of the system. This should save energy initially. The utilization of new booster pumping stations should reduce energy through more efficient pumping.

6.2.6 Water Quality

Idaho well construction rules must be followed during well drilling operations to eliminate the threat of potential groundwater contamination.

6.3 Impacts Not Considered

There are no known impacts that have not been considered in this evaluation.

6.4 Unavoidable Adverse Impacts

To our knowledge, there are no unavoidable adverse impacts that cannot be fully mitigated except for perhaps energy use. Initially energy use may drop. But as the community grows and approaches the design capacity of the system energy use may increase in the provision of drinking water compared to existing conditions.

7.0 MEANS TO MITIGATE ADVERSE ENVIRONMENTAL IMPACTS

7.1 Mitigation Measures

7.1.1 Physical Aspects

The plans and specifications for the proposed water supply infrastructure will include short term and long erosion control measures to eliminate the threat of erosion. This will include construction BMP's and long term measures including energy dissipation devices of tank over flow structures, grading and landscaping.

7.1.2 Air Quality

No burning of construction waste will be allowed. The contractor must also control fugitive dust during construction. Dust control measures during construction are required by DEQ. These include the use of water chemicals or dust suppressants during demolition, stockpiling, grading operations, prompt removal of materials stored on site or in streets, covering the loads of trucks and covering or hooding any operations that tends to produce dust.

7.1.3 Energy

Energy may initially reduce as a result of this project using efficient booster pumping stations and potentially pumping more at off-peak hours when energy costs are reduced. Water conservation should also reduce energy consumption. Utilizing energy efficient building designs will reduce energy loss during cold weather months.

7.1.4 Water Quality

The contractor will follow a SWPPP plan and implement storm water BMP's to control storm water runoff. A means of controlling sediment from leaving the site will also be implemented during well drilling processes. Excess water from well drilling and test pumping will be channeled to an existing natural drainage for disposal. Chemicals not meeting National Sanitation Foundation requirements cannot be used in the drilling and well construction process.

7.1.5 Cultural Resources

Construction will be halted immediately by the owner's contractor upon discovery of any cultural resources to enable the SHPO and Tribal HeTO to provide guidance and direction on what to do.

7.1.6 Public Health

The Water Corporation should make sure that any future development adjacent to ground water wells should ensure that septic tanks and drain fields are placed more than 100 feet away. Septic tanks and drain fields should also never be allowed to be placed within 50 feet of a booster pump station, storage tank, or waterlines.

7.1.7 Hazardous Waste

Accidental surface spills of petroleum hydrocarbon products of 25 gallons or more are required to be reported within 24 hours in accordance with IDAPA 58.01.02.851 and 852. The debris from the demolition of existing Tank 1 should be disposed of in accordance with local codes for construction debris and deposited in a licensed landfill.

7.2 Means of Achieving Mitigation Measures

7.2.1 Physical Aspects

Storm water BMP's which will be identified for controlling storm water runoff from the project are enforceable through the EPA under the conditions of the Construction General Permit. The SWPPP plan drafted by the owner or his representative and implemented by the owner's contractor will identify periodic monitoring to ensure storm water BMP's are in place and functioning. Monitoring will be conducted by the contractor. Contractors work will be periodically observed by the owner and engineer.

Comore Loma Water Corporation has the authority and the ability to ensure the provisions of the SWPPP for project work are followed through payment or non-payment to the contractor responsible for implementing the SWPPP.

DEQ through the standard review process retains review authority of all plans and specifications of this project including stormwater BMP's.

7.2.2 Air Quality

The proper disposal of construction debris and dust control will be written into construction documents prepared by the owner's representative. The contractor will be reminded of these obligations during the preconstruction conference.

Periodic inspection by the Owner or his representative will ensure that no-burn policies, dust control measures are implemented. The Owner will have non-payment authority if satisfactory compliance is not achieved.

DEQ through the standard review process retains review authority of all plans and specifications of this project including dust control measures and burning of construction wastes. No-burn policy is also enforceable directly by DEQ.

7.2.3 Energy

Energy goals will be identified in the conditions of the construction loan offer from DEQ and implemented as part of the preparation of the plans and specifications development. DEQ through the standard plan and specification review process retains review authority of all plans and specifications of this project including energy efficiency goals. Efforts to reduce energy will be ongoing by the water corporation after the project is completed.

7.2.4 Water Quality

Proper treatment of excess water from well construction operations is enforceable through the EPA under the conditions of the Construction General Permit. The SWPPP plan drafted by the owner or his representative and implemented by the owner's contractor will identify periodic monitoring to ensure BMP's for well water discharges are in place and functioning. Monitoring of SWPPP will be conducted by the contractor. Contractors work will be periodically observed by the owner and engineer.

DEQ through the standard review process retains review authority of all plans and specifications of this project. DEQ may also allow the Idaho Department of Water Resources to review the well drilling plans and specifications. A permit for the well drilling from IDWR will be required. This permit will identify any special well drilling requirements that must be followed to comply with the Idaho well drilling rules.

Comore Loma Water Corporation has the authority and the ability to ensure the provisions of the SWPPP for project work are followed through payment or non-payment to the contractor responsible for implementing the SWPPP.

7.2.5 Cultural Resources

The following will be written into construction documents and specifications to protect any critical resources found: "In the event of an inadvertent discovery (cultural resources and/or human remains) the Shoshone-Bannock Tribes HeTO requests a Stop Work Order of construction activities and immediate notification to the Tribes HeTO. Construction shall cease until proper treatment of cultural resources and/or human remains is achieved. The contact for the Shoshone-Bannock Tribes is Carolyn Smith, cultural Resources Coordinator at (208) 236-1084, email: romartinez@sbtribes.com. The Owner or Contractor will also call the Idaho SHPO office at (208)334-3861."

DEQ through the standard review process retains review authority of all plans and specifications of this project including provisions that ensure the protection of cultural resources.

The Contractor will also be advised of his role in archeological preservation during the preconstruction conference.

Periodic inspection by the Owner or his representative shall observe when on site for any sign of archeological findings. Comore Loma Water Corporation has the authority and the ability to ensure the provisions concerning preservation of cultural resources are followed through payment or non-payment to the contractor responsible for stopping work if cultural resources are found and not reported.

7.2.6 Public Health

The water corporation should review any septic tank permit located near booster pump stations, storage tanks, wells or waterlines to ensure separation distances are met prior to the health department approving the permit. Comore Loma Water Corporation must work with the health department to ensure that this occurs.

7.2.7 Hazardous Waste

Construction documents will require proper care of petroleum products by contractor. Periodic inspection by the Owner or his representative will ensure that measures and proper care of petroleum products are followed.

The Owner will have non-payment authority if satisfactory compliance is not achieved.

DEQ through the standard review process retains review authority of all plans and specifications of this project including proper disposal of accidental surface spills of petroleum products.

8.0 PUBLIC PARTICIPATION

8.1 Public Review of Proposed project and Environmental Impact

The public had opportunity to review and comment on the proposed project and environmental impacts during a public comment period from January 9, 2014 to February 6, 2014. The public notice is attached to this section. This notice was mailed to all patrons and vacant lot owners on December 27, 2013. This notice was also posted on the corporation website at www.clwcorp.net.

8.2 Public Meetings

A public information meeting was held on January 23, 2014 to explain the facility planning study and the various aspects of the project alternatives so that the public could offer informed comment. A copy of the sign-in sheets from the meeting are attached to this section. A representative from DEQ was present. The board put the decision in the hands of the patrons by organizing a vote.

At the public meeting, the corporation board presented the selected alternatives to the patrons. The board had previously in many board meetings, consulted with DEQ and the Engineer and narrowed the alternatives to those discussed in this report as explained in Subsection 3.1. The complete PowerPoint type presentation given to the patrons during the public meeting is provided at the end of this section with other public involvement documentation.

Corporation patrons voted on February 13, 2014 to decide what to do. The overwhelming majority of patrons voted for Alternative 13, also known as Alternative C but without individual water meters. A sample ballot, ballot procedure and official vote results are attached to this section. Due to the narrowing of options considered in the ballot procedure and presented at the public meetings the same options were considered and reviewed in this report.

8.3 Substantial Issues

The public meeting held on January 23, 2014 included a lively discussion of the issues. Refer to the meeting minutes attached to this section for details. There was one written comment presented to Comore Loma Water Corporation concerning the threat of increased monthly residential water bill. It is attached at the end of this Chapter.

8.4 Address Substantial Public Concerns

The nature of the comments and questions are given in the attached public meeting minutes. Questions covered a wide array of topics including making sure the primary developer pays a fair share, water meters and associated costs, why anything has to be done, water pressure, the change of regulatory requirements of county and state jurisdictions, grandfathering and regionalization with the neighbors. Questions were varied and sincerely spoken in an effort to understand the issues. The board addressed patrons questions and invited the engineer to help when needed.

8.5 Address State and Federal Agencies Comments

State and Federal agencies were mailed consultation letters describing the scope of the project along with a map showing the proposed improvements. The agencies were invited to comment on the environmental impacts of the project. Agency responses have been noted and addressed in the applicable sections of this document and are also attached in Chapter 10.

PUBLIC PARTICIPATION DOCUMENTS

- Public Meeting Notice (mailed to all landowners and homeowners)
- Sign-In Record Sheets of Public Meeting Attendees
- Paper Copy of Powerpoint Presentation Prepared by CLWC Board
- Public Meeting Minutes
- Written Comments (one comment received)
- Voting Procedure
- Sample Ballet
- Official Voting Reults

Public Meeting Notice

The Comore Loma Water Corporation (Corporation) will hold a public meeting on Thursday, January 23, 2014 at Sand Creek Middle School located at 2955 Owen St., Ammon, Idaho 83406 at 7:00 p.m. The purpose of the public meeting is to present and discuss the draft Comore Loma Water Corporation Drinking Water Facility Planning Study. This includes explaining the upgrade alternatives addressed in the facility plan including potential environmental impacts of each alternative, explaining the funding options available to the Corporation and the potential financial impacts on the members, and soliciting verbal and written comments regarding the alternatives under consideration.

A copy of the plan is now available for review during normal business hours at DEQ in Idaho Falls at 900 N. Skyline Drive, Suite B, Idaho Falls, Idaho 83402, the office of the engineer, Schiess & Associates at 7103 S. 45th West, Idaho Falls, Idaho 83402 and on the Corporation website: www.clwcorp.net. Written comments will be accepted from January 9, 2014 to February 6, 2014. Please use the attached comment form to provide written comment. Mail comments to the Corporation post office box on the form.

After considering and addressing all written and verbal comments from the patrons, the Corporation Board of Directors will hold an election to select an improvement alternative and document the selection. A detailed environmental evaluation will be performed on the selected alternative if the Corporation decides to move forward with DEQ SRF funding. This notice was mailed to every patron from January 2-6, 2014 and posted on the Corporation website at www.clwcorp.net.

72 TOTAL REPRESENTED

Sign-In Sheet

Comore Loma
Draft Drinking Water Facility Planning Study
Public Meeting
Thursday, January 23, 2014

Name (Print or write clearly)	Title/Representing	Address	Phone
Brenda Andreason	Self	5566 S Tappan Falls	479-8821
Jim Southwick	Self	5117 Dagger Falls	522-2772
Dwight Hanson	Self	5212 S Marbrvc Lane	521-6689
Randy & Vicki Runnings	Self	5405 Hacienda Dr	524-1619
Alvin & Carolee Hall	Self.	5585 Tappan Falls Dr	390-5971
Steven & Deborah Giles	self	6890 Red Bluff LN	881 5852
John & Anne Westenby	self.	5633 E. Sagewood.	351-9356
Dedra + Steve Lucks	"	5086 E 65th S	523-6293
Ray Berry	self	6836 S. Comore Dr.	523-0638
Vern & Monica Peterson	" "	5105 E. Sagewood Dr	5295502
John Vesely	Self	5615 Canyonwood cir	552-2900
Todd Cornelison	Self	6085 E Sagewood	351-6108
Derick Attebury	self	940 Yellowpine	521-4500

Sign-in sheet will become part of the public record for this project.

GEORGE E VIVIAN self 5755 MARIBRISA 524-1016
16 Jim Cole self 5725 Solitude 535-1242
LINDA BUTTLES 5395 E. NEVESO CIR 520-5430

Sign-In Sheet

Comore Loma
Draft Drinking Water Facility Planning Study
Public Meeting
Thursday, January 23, 2014

Name (Print or write clearly)	Title/Representing	Address	Phone
DEBBIE BOREK by LORI CAMPBELL		5827 HIGH CREEK	619-985-4212
Glen & Sheila Walter		5589 Canyonwood Circle	817 929 9887
RAndy Schubnge		5720 S Comsoldr	681-2199
Bruno H Jachmann		5675 S. Marbrisa Ln.	523-8357
JIHAD ALJAYOUSHI		6143 E MIDDLE FORK	529-4020
Tina BATASKA		5405 High Willow	303 5967793 5 ~~284468~~
Bill Windels		5152 E. Powerhouse Dr	542-5056
Bob Wilkins		6757 Red Bluff	529-1655
Keith ARTERBURN		5723 E 65 S.	351-2999
Bob Linda Quinn		5590 S. Marbrisa	529-2611
Brian Cunningham		5250 House Rock Cir	523-5422

11

Sign-in sheet will become part of the public record for this project.

Sign-In Sheet

Comore Loma
Draft Drinking Water Facility Planning Study
Public Meeting
Thursday, January 23, 2014

Name (Print or write clearly)	Title/Representing	Address	Phone
Sherry Long		5730 S. Marbrisa Ln IDAHO FALLS, ID 83406	208 5229522
Todd Williams		~~582~~ 5818 Bg Horn Cr 83406	403 0699
Clinton Sheppard		6015 Marbrisa Lane	538-0711
Elizabeth Burgon		"	"
[illegible]		IDEQ	
Rich Kearsley		5337 E Powerhouse	419 3798
Greg English		4940 East Loma Circle	523-1683
WAYNE SIMPSON		7015 CULEBRA RIO CIR IF 83406	521-4359
Brad Million		6687 Red Bluff	240 620 9529
Don Stamer		5895 E SAGEWOOD	524 9024
John D. Howard		5204 Tappan Falls	523-0377
Rick Miller	ECIPDA	299 E. 4th Rexburg	
Gibbons		4970 E. 65th S.	552-7263

Sign-in sheet will become part of the public record for this project.

13

Sign-In Sheet

Comore Loma
Draft Drinking Water Facility Planning Study
Public Meeting
Thursday, January 23, 2014

Name (Print or write clearly)	Title/Representing	Address	Phone
TONY BURTON		5705 COTTONWOOD CIRCLE	201-5703
DAVE SKIDMORE		7235 CLIFFSIDE	681-1299
Oliver Roberts		5680 Sagewood	339-3602
DARVIN BOYLES		7474 CLIFFSIDE	716-3301
Craig + Cindi Winder		7186 S Bowman	521-7290
John Zietz		5354 E. Powerhouse Dr.	201-1457
Stefanie Streeper		9815 N Yellowstone Hwy	521.5214
Brad Streeper		" "	521.6100
Rich & Stephanie Meyers		5060 Comish	360-6326
Sherry/David Smith		5000 Comish	529.9313
Tom Hackney		5851 E. Sagewood	932-0361
JAKE & MICHELLE BLACK		6070 E SAGEWOOD DR	522-4178
Paul & Cindy Gerlach		6584 RED BLUFF LN	5221780

Sign-in sheet will become part of the public record for this project.

Ed Hoskins 6535 Red Bluff Ln. 523-4883

CHRIS MONTI 6644 ENSENADA CIR 7168154.

15

Name	Address	Phone
Gordon Durrant & Colleen	4990 E Sagewood	542-6551
Les Morse	7040 So. Sageview Cir	709-7573
Jed Zirker	5646 E Sagewood Dr	522-6549
Chad Landon	5655 Sagewood	520-3001
Josh Scott	5465 Rio Seco Dr.	390-8235
Angie English	4940 E. Loma Cir	523-1683
Casey D. Peterson	6964 S. Marble Cir	709-9898
Travis Water	5255 Hoverock	317-5544
Ron Ryan	5800 Marbrisa	522-5367
MARK & PAM FETZER	7293 S BOWMAN LN	523-9500(h) 317-2055(c)
Carolyn Dustin	5120 E Cornish	523-9921
Russel Lewis	7653 Cliffside lane	206-2588
Rick Evans	6670 Sagewood CT	357-4196

Name	Address	phone
MARK BINDENAGEL	5385 E. SKIDMORE DR.	529-1069
Jeff & Pam Shearer	6808 Big Bend Dr	589-8800
Richard Hill	5273 E. Skidmore Dr	528-6169
Bill Dalton	5379 E 65th So	351-9249
Fred Schneyden	4810 Comish	584-1390
Tom Feelen	7836 Marple Circle	557-0239

6

Status Report

2013 Committee Recommendations

Audit Results

Attorney Meetings

2013 Committee Recommendations

- Cease debt finance efforts
- Keep $600 base rate
- Implement following:
  - Install new booster station at Tank 1
  - Purchase spare 300 hp motor
  - Relocate Tank 2 feeder line

- Efforts on hold
- Done
  - Insufficient funds (est. $250-350K req'd)
  - Complete
  - Complete

2013 Committee Recs Cont.

- Purchase spare 125 HP motor
  - Complete
- Construct housing on Well 5
  - Essentially complete

- Implement watering restrictions
  - Done
- Complete surveys
  - Done
- Develop cash plan for Tank 1 Replacement
  - Completed (to be presented this meeting)

2013 Committee Recs Con't

- Initiate outside Audit
- By-laws Changes
  - No changes w/o vote of Shareholders
  - BOD not authorized to incur debt w/o vote

- Complete
  - Tabled by shareholders
  - Approved

Restricted Schedule Impacts

- No water outages this season
- Notices of Violation issued
  - 1st Notice (courtesy): 134
  - 2nd Notice (warning): 27
  - 3rd Notice ($200 fine): 6
  - 4th Notice (shut-off): 0

Audit Results

Conducted August 2013

(First ever Formal CLWC Audit)

Audit Findings

Audit Parameter	**Findings**
• Qualitative aspects of Accounting Practices	• All significant transactions properly recognized – Financial statement disclosures are neutral, consistent, and clear
• Difficulties Performing Audit	• None
• Misstatements	• Corrected (none were material)
• Disagreements	• None

Audit Deficiencies (2)

Deficiency

- CLWC does not have system for tracking capital assets
- CLWC does not have sufficient separation of duties (i.e. more people involved in finances)

Response

- Do not have historical data but will track future
- Cost of hiring independent outweighs benefit…but will implement stricter internal controls/checks within Board going forward

Audit Recommendations

- Internal Controls
  - Someone other than check writer should review bank statements
  - Board review/approve invoices before paid
  - Only board members should have signature authority (Dennis Bell signs checks but he is no longer a BOD member)
  - At least 2 individuals should be involved in billing and receiving process

Attorney Meetings

CLWC Legal Authority

Water Rights

CLWC Legal Authority

- BOD indemnified by Idaho Code
- Articles and By-laws give BOD authority to:
  - operate and manage water system
  - impose fines for violation of irrigation schedule
  - restrict or curtail delivery of water
- One or more notices of violation should be sent to offenders before imposing fine or curtailment

Water Rights

- Ownership of water rights successfully transferred from Developer to CLWC
  - Each Comore Loma lot is now assigned to a specific water right
- CLWC currently has sufficient rights to cover 520 lots
  - We have pumping capacity for 425 homes per DEQ requirements
- Developer has additional rights for 300 more lots

Engineering Report

Overview
Findings & Deficiencies
Conclusions & Recommendations
Alternatives/Costs
BOD Thinking

Overview

- Scope
  - Describes existing CLWC system
  - Evaluates present condition
  - Analyzes alternatives and proposes course of action
- Focus
  - Well supply
  - Storage and pumping deficiencies/needs
  - Justification of capital improvements (meet DEQ req’mts)

Report Findings & Deficiencies

- System lacking 2032 gpm for full demand plus Fire Flow (FF = 1500 gpm)
- Hydrant spacing marginal in older division
- Tank 1 undersized
- Tank 2 insufficient to meet FF demand
- *"…patrons have shown continued determination to use large amounts of water…requires extraordinary demand for costly infrastructure…"*

Report Conclusions & Recommendations

- Use 30-yr horizon to plan for and construct facilities
  - Finance via SRF loan
- Install water meters to reduce demand
- All water rights should be transferred to CLWC
- Transfer Tank 2 BPS to Big Bend BPS
  - Would then house 2 sets of pumps
  - Serve as BPS for both Zone 3 and Zone 4

Report Alternatives/Costs

- O&M costs a major consideration for each
- 12 Alternatives considered
  - Narrowed to 4
    - Alt 8 - $4.88 million (no add'l annual O&M given)
    - Alt 10 - $3.26 million (add'l annual O&M $106K)
    - Alt 11 - $3.12 million (add'l annual O&M $85K)
    - Alt 12 - $3.66 million (add'l annual O&M $94K)
  - Report recommended Alternative 11

Alternative 11 Components

Item	Cost
1. Replace valves and add hydrants	• $163,400
2. Add flow meters to pumps	• $42,000
3. Replace Well 1	• $250,000
4. Well house for Well 1	• $432,800
5. Tank 1 Booster Station	• $492,200
6. New 422K gal storage tank for Zone 1	• $395,400
7. Additional 342K gal companion storage Tank 2	• $344,600

Alt 11 Components Cont.

Item	**Cost**
8. Upgrade Tank 2 BPS to (3) 40 hp pumps	$ 110,000
9. Loop Zone 3 w/ 8 in pipe	$ 50,700
10. Portable trailer-mounted 300 KW generator	$ 150,000
11. Water meters (1 “)	$ 617,800
12. SCADA improvements	$ 15,000
	$3,063,900
	$ 61,000 (admin, etc.)
	$3,124,900

BOD’s View

- O&M costs are eating our lunch (primarily electricity/wear and tear during peak watering season)
- Alternatives presented all too expensive
- Need to “cherry-pick” line items for a hybrid approach
  - Because DEQ has accepted report, no further approval required for included line items
  - Per attorney review, system is grandfathered -- *line item improvements included in report DO NOT trigger retroactive FF compliance req’mts*

What's Truly Needed

- Backup pumping capability
  - Supply
  - Boosting
- Improved fire protection
  - More storage capacity
  - Backup power
  - Sufficient hydrants
- System Control and Data Acquisition (SCADA) hardware/software need updating

3 Options to Consider (Engineers' Estimated Costs)

- Minimum Requirement (Option A)
  - $1.2 to $1.4 million
- Engineer's Alternative 11 – w/o meters (Option B)
  - $2.6 million
- Board "Hybrid" (Option C)
  - $2.9 million

Option A1 ($1.4 million)

- Minimum Req'd Action
  - Booster station at Tank 1 ($492K)
  - Additional, larger "Tank 1.1" ($395K)
  - Add flow meters at existing pump stations ($42K)
  - Add hydrants and replace valves ($163K)
  - SCADA improvements ($15K)
- CASH financed

Option A2 ($1.2 million)

- Minimum Req'd Action
  - Booster station at Tank 1 ($492K)
  - Additional, larger "Tank 1.1" ($395K)
  - Add flow meters at existing pump stations ($42K)
  - Add hydrants and replace valves ($163K)
  - SCADA improvements ($15K)
- Loan financed

Option B ($2.6 million)

- Option A “Must Do’s” plus
  - Replace Well 1 ($250K)
  - Well House for Well 1 ($433K)
  - Additional 340K gal Storage Tank “2.1” ($345K)
  - Upgrade Tank 2 BPS ($110K)
  - Loop Zone 3 w/8-in pipe ($51K)
  - Portable 300 KW generator ($150K)

Option C ($2.9 million)

- "Hybrid" Approach
  - Option A "Must do's", plus
  - Drill new Well 7 ($225K)
  - Well house and pumps for Well 7 ($373K)
  - Build new 530K gal Storage Tank 3 ($470K)
  - Complete Big Bend BPS ($352K)
  - Portable trailer-mount generator ($150K)
  - Water line from Zone 4 to Tank 3 ($124K)

Why Option C?

- We get the important long-term things we need
  - Backup well for $85K less
  - Larger storage higher up the hill benefits WHOLE community
  - Greater fire protection capability
- Test hole verified there IS water at Well 7 site
- Reduces long-term O&M costs over Option B
- CLWC has control of entire system
- Joint Venture mutually beneficial over long-term
  - DEVELOPER PICKS UP TAB for new well and bulk of storage, lowering cost to each homeowner

Water Meter Option

Engineer Report: "…*meters are only effective way to control demand…*"

- Clear evidence that meters do control demand, but cost is not insignificant
  - "Additive M" (separate vote)
  - 1" meter per lot (owner can pay upgrade to 2")
- Alternative is to continue billing based on acreage irrigated vs actual water used

Meter Cost
(Engineers' Estimated Cost)

Option	Additive M	
Type Funding	Cash (4 yrs)	Debt (30 yrs)
Cost	642K	642K
Annual Debt Service	160K	26K
Annual share from:		
320 homeowners	$500	$80
Quarterly Cost per:		
homeowner	$125	$20

Going Forward Assessment Basis

- BOD Recommendations
  - Vacant lots pay portion of improvements
  - Future builders pay one-time “tap fee”
    - Triggered by request for service
    - Amount to be determined
    - Pays for accrued benefits provided by CLWC investment over the years

Funding

The Good, the Bad and the Ugly

Cash Funding

Pros

- No long term lock-ins
- No government oversight/ regulation
- Can pay as we can afford
- Helps promote conservation
- Ensures shareholder buy-in and ownership of "The Plan"

Cons

- Will require significant assessments and/or rate increases over next 4 years
- Limits number of improvements achievable
- Can't start until we have cash in hand

Debt Funding

Pros

- SRF Loan has attractive terms
  - 30-yr at 1.25% interest
  - 7% origination grant effectively offsets interest
- Less monthly cash outlay for shareholders
- Can implement by next season
- Shareholders *NOT* exposed to personal liability/liens (per DEQ)
- *Developer treated as lot owner (i.e. pays like others)*

Cons

- Lots of strings attached
  - Additional administrative and labor costs incurred because Federal requirements
  - Significantly reduces buying power of funds (up to 40%)
- 30-yr bondage - what if new needs arise in 15 years?
- Nobody likes debt

Developer Treated as Lot Owner…

- If CLWC willing to accept Division 25 early, Developer would pay expansion-related share of loan
- Increases participation pool and reduces individual costs
  - – Developed lots – 320
  - – Non-Skidmore vacant lots – 120
  - – Skidmore vacant lots – 80

How does it all compare??

Summary View – Main Options

Option	A1	A2	B	C
Type Funding	Cash	Debt	Debt	Debt
Cost	1.4 million	1.2 million	2.6 million	2.9 million
Annual Debt Service	350K	46K	102K	115K
Annual share from:				
320 homeowners	255K	34K	74K	52K
120 vacant lots	95K	12K	28K	20K
80 Skidmore lots	0	0	0	43K
Quarterly Cost per:				
homeowner	$198	$26	$59	$40
vacant lot	$198	$26	$59	$40
Skidmore lot	$0	$0	$0	$134

Summary View – Meters

Option	Additive M	
Type Funding	Cash (4 yrs)	Debt (30 yrs)
Cost	642K	642K
Annual Debt Service	160K	26K
Annual share from:		
320 homeowners	$500	$80
Quarterly Cost per:		
homeowner	$125	$20

Next Meeting We <u>Vote</u>!

- 13 Feb 2014
  - 7 PM
  - Sand Creek Middle School
- Between now and then
  - Educate yourselves
  - Information posted on webpage

<u>www.clwcorp.net</u>

CLWC System improvements information meeting

7:00 PM Jan 23, 2014 at the Sand Creek middle school in Ammon

John Buttles welcomed everyone and introduced Jake Dustin to make the presentation.

Presentation by Jake Dustin with the following question/answer immediately following.

Q: Does the meter cost include meter upkeep and/or meter reading?
A: No.

Q: Why don't we have the option to do absolutely nothing with the system?
A: It is not an option currently but the BOD will discuss it and possibly add it to the ballot.

Q: How much less water would be consumed if meters were installed?
A: Approx. 30%, but this all depends on the individual/situation.

Q: Has consideration been given to spreading watering hours out?
A: The management of other watering schedules (i.e. set hours rather than days) would be extremely difficult to manage.

Q: Would low water usage months help compensate for higher usage months?
A: This has not really been considered yet.

Q: Can the BOD actually charge vacant lots a fee?
A: Yes.

Q: Would all of the improvements on Tank 1still be warranted with all of the improvements further up the hill?
A: System is designed such that Tank 1 is still needed.

Q: Is Well 1 operational?
A: No.

Q: Is there a prepay penalty associated with the SRF Loan?
A: No, there may be other options to pay off early.

Q: How many votes does the developer (Comore Development) get?
A: Approximately 80.

Q: Do vacant lots get a vote?
A: Yes

Q: Who owns the additional 300 lots worth of water rights?
A: Comore Development.

Q: What are we going to do as a community on a go forward basis?
A: Control our use and conserve water.

Q: Can you reduce your lawn acreage?
A: Yes.

Randy Skidmore's comments and explanation on voting. Randy stated that of his lots (personal and business) he would not exercise the right to vote so as to not sway the decision.

Q: Can we be annexed into the City of Ammon?
A: You have to have ground contiguous with the city and pay in order to have this done.

Q: What did the $750 assessment go towards?
A: Last year's expenses and further repairs.

Q: How long will the improvements last?
A: Depends on the rate of consumption.

Q: Without flow meters, how were the usages for the engineering report determined?
A: Through the Supervisory Control and Data Acquisition (SCADA) system. The error could be as much as 20%.

Q: What happens when people default?
A: The corporation uses the methods outlined in the bylaws to collect all amounts due.

Jihad was very quick to thank the BOD and the Ad Hoc Committee for their time and some really seems to take what he said to heart, he emphasized the point that this is our problem to deal with and that we best get after it before other parties get involved.

John Buttles closed the meeting and encouraged everyone to ponder what had been presented and to show up to ready to vote on Feb 13.

Comment Form

Comore Loma Water Cormporation

Draft Drinking Water Facility Planning Study

Public Meeting

January, 23, 2013

Name (Print or write clearly)	Title/Representing	Address	Phone
GRand + Faye Leavitt		5987 S. Big HoRn Idaho Falls, ID	522-0631 oR 680-6202

What concerns or questions do you have about this project?

Do you have any information that could improve the outcome of this project?

Will you comment about the proposed alternatives for this project, their financial impacts and potential environmental impacts?

Please articulate your comments in the space provided below. Please send completed form to Comore Loma Water Corporation at P.O. Box 1863, Idaho Falls, Idaho 83403 postmarked no later than February 6, 2014. Comments may also be submitted by email at www.clwcorp.net. Comments will become part of the public record for this project.

Comments:

We aRe concerned that wateR incReases will Result in ouR need to sell our home as when we built we neveR anticipated ouR Rates increasing.

Comore Loma Water Corporation

VOTING PROCEDURE

Voting will be on February 13 at the Sand Creek Middle School, 2955 Owen, Ammon, starting at 7:00 PM and ending at 7:30 PM. Bring valid photo ID.

All votes will be counted immediately.

Please remain for the announcement of the results and in case a runoff is required.

If you will be unable to attend the meeting, you are encouraged to assign someone you trust as your proxy. Your assignee will need to present a properly executed proxy form at the meeting in order to vote on your behalf. The proxy form is on the web page (www.clwcorp.net)

Sample Ballot You will pick up a valid ballot at the Feburary 13 meeting

BALLOT

SYSTEM IMPROVEMENT	SELECT ONE OPTION
OPTION A1 IMPROVEMENTS	
OPTION A2 IMPROVEMENTS	
OPTION B IMPROVEMENTS	
OPTION C IMPROVEMENTS Recommended by the BOD	

SYSTEM WATER METERS	Yes	No
WATER METERS		

Official Voting Results February 13, 2014

Option	A1	A2	B	C	D
	2	10	28	123	27

Water Meters	Yes	50	No	121

Thank You to all that voted.

9.0 REFERENCES CONSULTED

U.S. Census Bureau American Factfinder. Available at http://factfinder2.census.gov Accessed 2 February 2014

Scoresby, Paul. *Comore Loma Water System Facility Planning Study.* Idaho Falls: Schiess and Associates, 2013, Revised 2014

Comore Loma Water Corporation DEQ Source Water Assessment. Available at www.deq.state.id.us/water-quality/source-water/assessments.aspx Accessed 28 March 2014

National Wild and Scenic Rivers System. Available at http://www.rivers.gov/Idaho.php Accessed 27 March 2014

Miles, Ray L. *Soils Survey of Bonneville County Area.* Idaho: USDA Soil Conservation Service in Cooperation with University of Idaho, College of Agriculture Idaho Soil Conservation Commission, 1981

Floyd, Lt. Richard P., Geodetic Bench Marks NOAA Manual NOS NGS 1, Rockville, MD, 1978

Carrell, P. Personal Communication, May 6, 2014. Gave prescriptive frost depth for Bonneville County, ID at Comore Loma as 30 inches.

Community Facts - **Find popular facts (population, income, etc.) and frequently requested data about your community.**

Enter a state, county, city, town, or zip code: Bonneville County, Idaho GO

Bonneville County, Idaho

Census 2010 Total Population

104,234

Source: 2010 Demographic Profile

Popular tables for this geography:

2010 Census
- General Population and Housing Characteristics (Population, Age, Sex, Race, Households and Housing, ...)
- Race and Hispanic or Latino Origin
- Hispanic or Latino by Type (Mexican, Puerto Rican, ...)
- Households and Families (Relationships, Children, Household Size, ...)

American Community Survey
- Demographic and Housing Estimates (Age, Sex, Race, Households and Housing, ...)

Population Estimates Program
- Annual Population Estimates

Census 2000
- General Demographic Characteristics (Population, Age, Sex, Race, Households and Housing, ...)

- Want more? Use Guided Search or Advanced Search, or visit Census.gov's Quick Facts.

1 Community Facts 2 Table Viewer

QT-P1

Age Groups and Sex: 2010
2010 Census Summary File 1

BACK TO COMMUNITY FACTS

NOTE: For information on confidentiality protection, nonsampling error, and definitions, see http://www.census.gov/prod/cen2010/doc/sf1.pdf.

Geography: Bonneville County, Idaho

1 41 of 41

Age	Number			Percent			Males per 100 females
	Both sexes	Male	Female	Both sexes	Male	Female	
Total population	104,234(r39020)	51,996	52,238	100.0	100.0	100.0	99.5
Under 5 years	9,975	5,169	4,806	9.6	9.9	9.2	107.6
5 to 9 years	9,507	4,826	4,681	9.1	9.3	9.0	103.1
10 to 14 years	8,352	4,329	4,023	8.0	8.3	7.7	107.6
15 to 19 years	7,517	3,888	3,629	7.2	7.5	6.9	107.1
20 to 24 years	6,279	3,043	3,236	6.0	5.9	6.2	94.0
25 to 29 years	7,776	3,906	3,870	7.5	7.5	7.4	100.9
30 to 34 years	7,526	3,835	3,691	7.2	7.4	7.1	103.9
35 to 39 years	6,233	3,098	3,135	6.0	6.0	6.0	98.8
40 to 44 years	5,736	2,885	2,851	5.5	5.5	5.5	101.2
45 to 49 years	6,699	3,364	3,335	6.4	6.5	6.4	100.9
50 to 54 years	6,509	3,275	3,234	6.2	6.3	6.2	101.3
55 to 59 years	5,992	2,953	3,039	5.7	5.7	5.8	97.2
60 to 64 years	4,790	2,403	2,387	4.6	4.6	4.6	100.7
65 to 69 years	3,516	1,638	1,878	3.4	3.2	3.6	87.2
70 to 74 years	2,611	1,250	1,361	2.5	2.4	2.6	91.8
75 to 79 years	1,996	929	1,067	1.9	1.8	2.0	87.1
80 to 84 years	1,637	637	1,000	1.6	1.2	1.9	63.7
85 to 89 years	1,063	400	663	1.0	0.8	1.3	60.3
90 years and over	520	168	352	0.5	0.3	0.7	47.7
Under 18 years	32,794	16,889	15,905	31.5	32.5	30.4	106.2
18 to 64 years	60,097	30,085	30,012	57.7	57.9	57.5	100.2
18 to 24 years	8,836	4,366	4,470	8.5	8.4	8.6	97.7
25 to 44 years	27,271	13,724	13,547	26.2	26.4	25.9	101.3
25 to 34 years	15,302	7,741	7,561	14.7	14.9	14.5	102.4
35 to 44 years	11,969	5,983	5,986	11.5	11.5	11.5	99.9
45 to 64 years	23,990	11,995	11,995	23.0	23.1	23.0	100.0
45 to 54 years	13,208	6,639	6,569	12.7	12.8	12.6	101.1
55 to 64 years	10,782	5,356	5,426	10.3	10.3	10.4	98.7
65 years and over	11,343	5,022	6,321	10.9	9.7	12.1	79.4
65 to 74 years	6,127	2,888	3,239	5.9	5.6	6.2	89.2
75 to 84 years	3,633	1,566	2,067	3.5	3.0	4.0	75.8
85 years and over	1,583	568	1,015	1.5	1.1	1.9	56.0
16 years and over	74,745	36,828	37,917	71.7	70.8	72.6	97.1
18 years and over	71,440	35,107	36,333	68.5	67.5	69.6	96.6
21 years and over	67,692	33,216	34,476	64.9	63.9	66.0	96.3
60 years and over	16,133	7,425	8,708	15.5	14.3	16.7	85.3
62 years and over	14,046	6,393	7,653	13.5	12.3	14.7	83.5
67 years and over	9,843	4,310	5,533	9.4	8.3	10.6	77.9
75 years and over	5,216	2,134	3,082	5.0	4.1	5.9	69.2
Median age (years)	31.7	31.0	32.4	(X)	(X)	(X)	(X)

X Not applicable.

Source: U.S. Census Bureau, 2010 Census.

Summary File 1, Tables P12, P13, and PCT12.

Source: U.S. Census Bureau | American FactFinder

1 Community Facts 2 Table Viewer

QT-P3

Race and Hispanic or Latino Origin: 2010
2010 Census Summary File 1

BACK TO COMMUNITY FACTS

NOTE: For information on confidentiality protection, nonsampling error, and definitions, see http://www.census.gov/prod/cen2010/doc/sf1.pdf.

Geography: Bonneville County, Idaho

1 - 31 of 31

Subject	Number	Percent
RACE		
Total population	104,234(r39020)	100.0
One race	102,062	97.9
White	94,411	90.6
Black or African American	585	0.6
American Indian and Alaska Native	790	0.8
American Indian, specified [1]	497	0.5
Alaska Native, specified [1]	14	0.0
Both American Indian and Alaska Native, specified [1]	0	0.0
American Indian or Alaska Native, not specified	279	0.3
Asian	856	0.8
Native Hawaiian and Other Pacific Islander	86	0.1
Some Other Race	5,334	5.1
Two or More Races	2,172	2.1
Two races with Some Other Race	501	0.5
Two races without Some Other Race	1,575	1.5
Three or more races with Some Other Race	20	0.0
Three or more races without Some Other Race	76	0.1
HISPANIC OR LATINO		
Total population	104,234(r39020)	100.0
Hispanic or Latino (of any race)	11,912	11.4
Mexican	10,222	9.8
Puerto Rican	140	0.1
Cuban	53	0.1
Other Hispanic or Latino [2]	1,497	1.4
Not Hispanic or Latino	92,322	88.6
RACE AND HISPANIC OR LATINO		
Total population	104,234(r39020)	100.0
One race	102,062	97.9
Hispanic or Latino	11,109	10.7
Not Hispanic or Latino	90,953	87.3
Two or More Races	2,172	2.1
Hispanic or Latino	803	0.8
Not Hispanic or Latino	1,369	1.3

X Not applicable.
[1] "American Indian, specified" includes people who provided a specific American Indian tribe, such as Navajo or Blackfeet. "Alaska Native, specified" includes people who provided a specific Alaska Native group, such as Inupiat or Yup'ik.
[2] This category is comprised of people whose origins are from the Dominican Republic, Spain, and Spanish-speaking Central or South American countries. It also includes general origin responses such as "Latino" or "Hispanic."

Source: U.S. Census Bureau, 2010 Census.

Summary File 1, Tables P5, P8, PCT4, PCT5, PCT8, and PCT11.

Source: U.S. Census Bureau | American FactFinder

Feedback FAQs Glossary Help

MAIN | COMMUNITY FACTS | GUIDED SEARCH | ADVANCED SEARCH | DOWNLOAD OPTIONS

Community Facts - **Find popular facts (population, income, etc.) and frequently requested data about your community.**

Enter a state, county, city, town, or zip code: GO

Population (2010 Census)
Population (Latest Estimate)
Age
Business and Industry
Education
Housing
Income
Origins and Language
Poverty
Veterans

Bonneville County, Idaho

Median Household Income

51,254

Source: 2008-2012 American Community Survey 5-Year Estimates

Popular tables for this geography:

American Community Survey
- Selected Economic Characteristics (Employment, Commute, Occupation, Income, Poverty, ...)
- Income in the Past 12 Months (Households, Families, ...)
- Earnings in the Past 12 Months (Sex, Educational Attainment, ...)
- Employment Status (Age, Race, Sex, Poverty, Disability, Education, ...)
- Occupation by Sex and Median Earnings in the Past 12 Months

Census 2000
- Selected Economic Characteristics (Employment, Commute, Occupation, Income, Health Insurance, ...)

- Want more? Use Guided Search or Advanced Search, or visit Census.gov's Quick Facts.

Source: U.S. Census Bureau | American FactFinder

Feedback FAQs Glossary Help

MAIN | COMMUNITY FACTS | GUIDED SEARCH | ADVANCED SEARCH | DOWNLOAD OPTIONS

Community Facts - **Find popular facts (population, income, etc.) and frequently requested data about your community.**

Enter a state, county, city, town, or zip code: GO

- **Population** (2010 Census)
- **Population** (Latest Estimate)
- **Age**
- **Business and Industry**
- **Education**
- **Housing**
- **Income**
- **Origins and Language**
- **Poverty**
- **Veterans**

Bonneville County, Idaho

Individuals below poverty level

11.6% *Source: 2008-2012 American Community Survey 5-Year Estimates*

Popular tables for this geography:

American Community Survey
- Poverty Status in the Past 12 Months (Age, Sex, Race, Education, Employment, ...)
- Poverty Status in the Past 12 Months of Families (Family Type and Size, Race, Work, Education, Children, ...)
- People at Specified Levels of Poverty (Age, Sex, Race, Hispanic, Education, Citizenship, Work, Disability, ...)
- Children Characteristics (Poverty, Public Assistance, Age, Race, School Enrollment, ...)

Census 2000
- Selected Economic Characteristics (Poverty, Children, Income, Employment, ...)
- Individual Poverty Status (Age, Sex, ...)

* Want more? Use Guided Search or Advanced Search, or visit Census.gov's Quick Facts.

Source: U.S. Census Bureau | American FactFinder

IDAHO

Idaho has approximately 107,651 miles of river, of which 891 miles are designated as wild & scenic—less than 1% of the state's river miles.

Battle Creek
Big Jacks Creek
Bruneau River
Bruneau River (West Fork)
Clearwater River (Middle Fork)
Cottonwood Creek
Deep Creek
Dickshooter Creek
Duncan Creek
Jarbidge River
Little Jacks Creek
Owyhee River
Owyhee River (North Fork)
Owyhee River (South Fork)
Rapid River
Red Canyon
St. Joe River
Salmon River
Salmon River (Middle Fork)
Sheep Creek
Snake River
Wickahoney Creek

Choose a State Go
Choose a River Go

Seen as barren by the first explorers to today's first-time visitors, the rivers of the high desert simply hide their treasures well.

10.0 AGENCIES CONSULTED

10.1 List of Agencies Consulted

A list of agencies that were consulted with respect to environmental concerns is included herein. A letter was sent to each of the listed agencies on February 14, 2014 to request a review of the project and to provide comments related to those environmental resources(s) under their stewardship. The letter describes the project and requests environmental review comments. A copy of the letter and map (Figure 1) are included herein.

10.2 Agency Responses

A summary of the date's consultation took place and a summary of the responses from agencies is included herein. Copies of all agency responses and additional correspondence to find resolution are also included.

Schiess & Associates
IMPROVING COMMUNITY INFRASTRUCTURE

List of Environmental Reivew Agencies
Project Name: Comore Loma Drinking Water Facility Planning Study
Project #: 12076

Name	Representing	Environmental Resource Associated with Contact Agency	Address	City	State	Zip	Phone
James Joyner	US Army Corps of Engineers	Wetlands, 404 Permits, Flood Plains	900 N. Skyline Dr., Suite A	Idaho Falls	ID	83402	208-522-1676
Willie Teascher	Idaho Falls Department of Environmental Quality	Water Quality	900 N. Skyline Dr., Suite B	Idaho Falls	ID	83402	208-528-2650
Rensay Owen	Idaho Falls Department of Environmental Quality	Air Quality	900 N. Skyline Dr., Suite B	Idaho Falls	ID	83402	208-528-2650
Ethan Morton	Idaho State Historical Society	Historic and archaeological sites and sensitive areas	210 Main Street	Boise	ID	83702	208-334-3847
Susan Eastman	Environmental Assessment	For any project located over a Sole Source Aquifer of Streamflow Source Area	1200 6th Avenue, OWW 136	Seattle	WA	98101	206-553-6249
James Wentz	U.S. EPA, Idaho Operations Office	Water Quality, Air Quality	950 W. Bannock Street, Ste. 900	Boise	ID	83702	208-378-5746
Keri Sigman	Idaho Department of Water Resouces	Floodplain management, maps, general program assistance	322 East Front Street PO Box 83720	Boise	ID	83720	208-287-4928
Kellye Eager	District 7 Health Department	Solid Waste	254 "E" Street	Idaho Falls	ID	83402	208-523-5382
Brian Kelly	US Fish and Wildlife Service		1387 South Vinnell Way, Room 368	Boise	ID	83709	208-378-5256
Ted Howard	Shoshone-Paiute Tribe		PO Box 21	Owyhee	NV	89832	208-759-3199
Carolyn Boyer Smith	Shoshone-Bannock Tribes		PO Box 306 Pima Dr.	Fort Hall	ID	83203	208-478-3707

Schiess & Associates
ENGINEERING • PLANNING • LAND SURVEYING

7103 SOUTH 45TH WEST, IDAHO FALLS, ID 83402
OFFICE: (208) 522-1244 • FAX: (208) 522-9232

February 14, 2014

Keri Sigman, State NFIP Contact
Idaho Department of Water Resources
322 East Front Street
P.O. Box 83720
Boise, ID 83720

RE: Comore Loma Water Improvement Project – Request for Comments for Preparation of an Environmental Information Document

Dear Ms. Sigman:

The Comore Loma Water Corporation is in the final planning phase of developing a drinking water system improvement project which could be fully or partially funded by the Idaho Drinking Water State Revolving Loan Fund. The purpose of this letter is to request your review and response regarding any environmental impacts that your agency may identify for this proposed project pursuant to the Idaho Department of Environmental Quality's State Environmental Review Process which mirrors the National Environmental Policy Act.

The proposed project includes the following items:

- Replace Tank 1
- Construct Tank 3
- Finish drilling Well 7. The test hole for this well has been completed and was finished at 730 feet deep. Expected production is +/- 1,000 gpm.
- Construct new booster pump station adjacent to new Tank 1
- Complete the construction of the booster pump station on Big Bend Drive. The structure and underground piping for this building has already been completed.
- Install transmission pipe from existing distribution system to Tank 3
- Add flow meters to existing well pump stations at Well 2, Well 3, Well 4 and Well 5 and improve SCADA system to obtain flow trend lines and flow totaling data
- Add 24 fire hydrants at various locations in the distribution system
- Replace broken distribution system valves. The location of valve replacement could be near any existing hydrant and at any existing distribution pipe intersection
- Purchase a portable generator and install manual switch gear for emergency use at booster pump station adjacent to Tank 1, booster pump station on Big Bend Drive and at one existing well yet to be determined.
- Install water meter boxes and meters on service lines for each home

The project is being proposed to eliminate system deficiencies, provide current required fire flow, improve storage and pumping and improve management through the collection of SCADA flow data. Enclosed is a map of the proposed project planning area and area of potential effect for all construction activities.

We request that you advise us of any comments that you may have regarding this project within 30 days, so the Comore Loma Water Corporation can proceed with the completion of the Environmental Information Document.

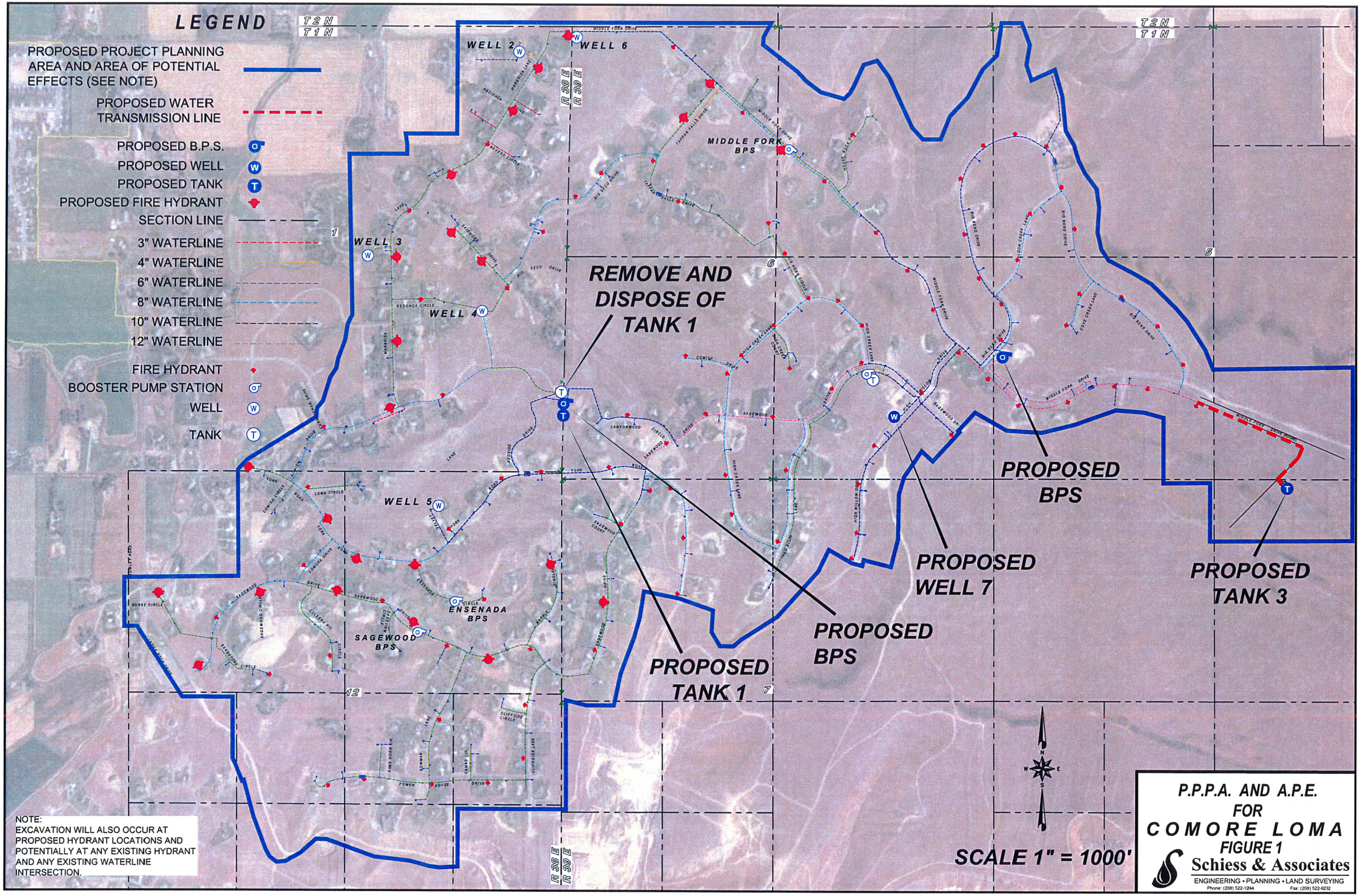
If you have any questions concerning the proposed project or if you need any further information, please feel free to contact me by phone at 208-522-1244 and by email at clerk@schiesseng.com at your convenience.

Sincerely,

Paul H. Scoresby

Paul H. Scoresby, PE

Encl: Map of Proposed Project Planning Area and Area of Potential Effect


LEGEND
PROPOSED PROJECT PLANNING AREA AND AREA OF POTENTIAL EFFECTS (SEE NOTE)
PROPOSED WATER TRANSMISSION LINE
PROPOSED B.P.S.
PROPOSED WELL
PROPOSED TANK
PROPOSED FIRE HYDRANT
SECTION LINE
3" WATERLINE
4" WATERLINE
6" WATERLINE
8" WATERLINE
10" WATERLINE
12" WATERLINE
FIRE HYDRANT
BOOSTER PUMP STATION
WELL
TANK
T2N
T1N
R38E
R39E
WELL 2
WELL 6
WELL 3
WELL 4
WELL 5
MIDDLE FORK BPS
REMOVE AND DISPOSE OF TANK 1
PROPOSED BPS
PROPOSED WELL 7
PROPOSED TANK 3
PROPOSED BPS
PROPOSED TANK 1
ENSENADA BPS
SAGEWOOD BPS
NOTE:
EXCAVATION WILL ALSO OCCUR AT PROPOSED HYDRANT LOCATIONS AND POTENTIALLY AT ANY EXISTING HYDRANT AND ANY EXISTING WATERLINE INTERSECTION.
SCALE 1" = 1000'
P.P.P.A. AND A.P.E. FOR COMORE LOMA
FIGURE 1
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Schiess & Associates
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7103 SOUTH 45TH WEST, IDAHO FALLS, ID 83402
OFFICE: (208) 522-1244 • FAX: (208) 522-9232

February 14, 2014

Susan Eastman, Hydrogeologist
EPA Region 10, Office of Environmental Assessment
1200 6th Avenue, OWW 136
Seattle, WA 98101

RE: Comore Loma Water Improvement Project – Request for Comments for Preparation of an Environmental Information Document

Dear Ms. Eastman:

The Comore Loma Water Corporation is in the final planning phase of developing a drinking water system improvement project which could be fully or partially funded by the Idaho Drinking Water State Revolving Loan Fund. The purpose of this letter is to request your review and response regarding any environmental impacts that your agency may identify for this proposed project pursuant to the Idaho Department of Environmental Quality's State Environmental Review Process which mirrors the National Environmental Policy Act.

The proposed project includes the following items:

- Replace Tank 1
- Construct Tank 3
- Finish drilling Well 7. The test hole for this well has been completed and was finished at 730 feet deep. Expected production is +/- 1,000 gpm.
- Construct new booster pump station adjacent to new Tank 1
- Complete the construction of the booster pump station on Big Bend Drive. The structure and underground piping for this building has already been completed.
- Install transmission pipe from existing distribution system to Tank 3
- Add flow meters to existing well pump stations at Well 2, Well 3, Well 4 and Well 5 and improve SCADA system to obtain flow trend lines and flow totaling data
- Add 24 fire hydrants at various locations in the distribution system
- Replace broken distribution system valves. The location of valve replacement could be near any existing hydrant and at any existing distribution pipe intersection
- Purchase a portable generator and install manual switch gear for emergency use at booster pump station adjacent to Tank 1, booster pump station on Big Bend Drive and at one existing well yet to be determined.
- Install water meter boxes and meters on service lines for each home

The project is being proposed to eliminate system deficiencies, provide current required fire flow, improve storage and pumping and improve management through the collection of SCADA flow data. Enclosed is a map of the proposed project planning area and area of potential effect for all construction activities.

We request that you advise us of any comments that you may have regarding this project within 30 days, so the Comore Loma Water Corporation can proceed with the completion of the Environmental Information Document.

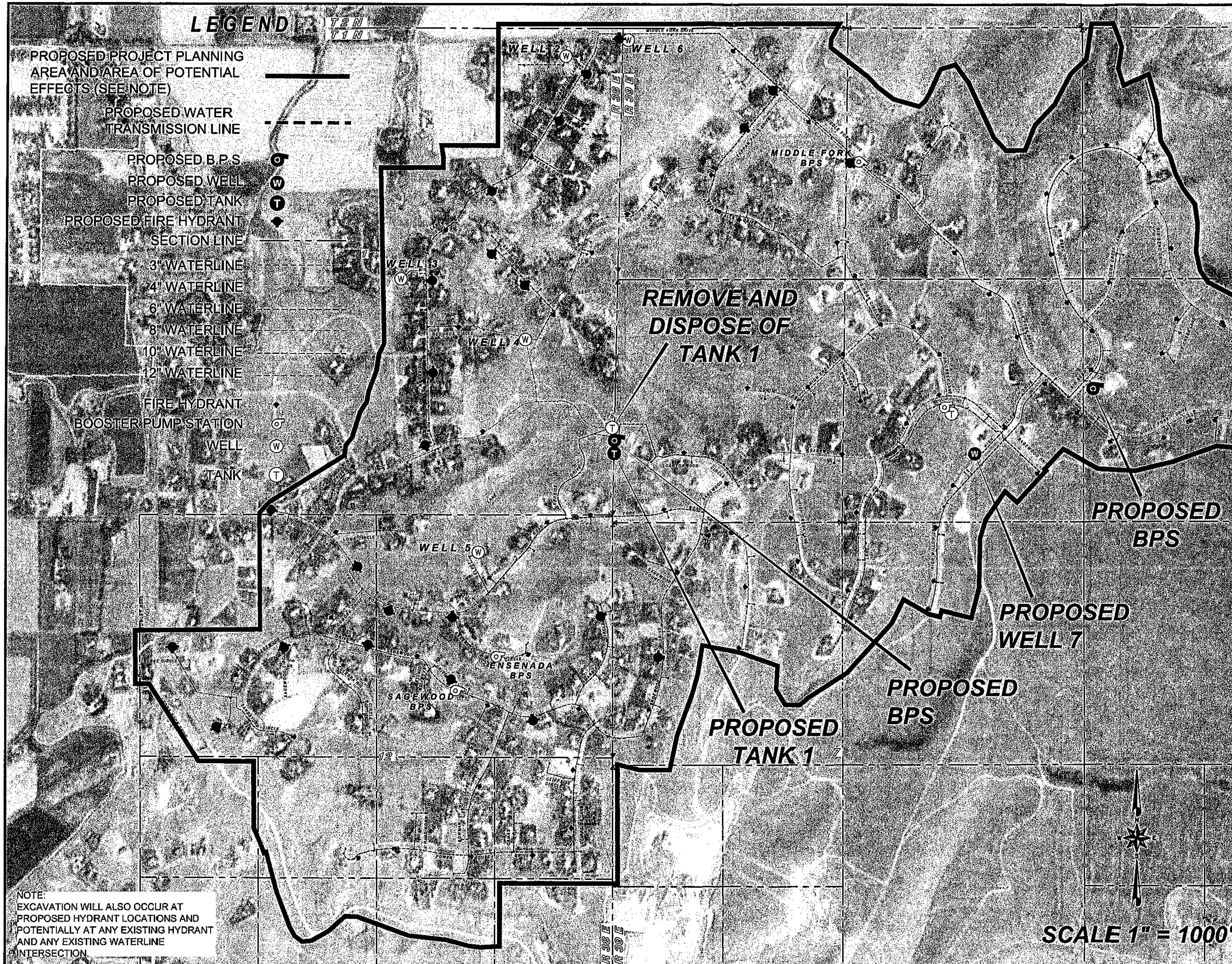
If you have any questions concerning the proposed project or if you need any further information, please feel free to contact me by phone at 208-522-1244 and by email at clerk@schiesseng.com at your convenience.

Sincerely,

Paul H. Scoresby

Paul H. Scoresby, PE

Encl: Map of Proposed Project Planning Area and Area of Potential Effect
Sole Source Aquifer Checklist
Sole Source Aquifer Map
IDWR Well Location Map
DEQ Source Water Assessment Static Map



P.P.P.A. AND A.P.E.
FOR
COMORE LOMA
FIGURE 1

Schiess & Associates
ENGINEERING • PLANNING • LAND SURVEYING
Phone: (208) 522-1244 Fax: (208) 522-9232

Sole Source Aquifer Checklist

1. Location and name of Sole Source Aquifer or Source Area
   The Eastern Snake River Plain Aquifer is nearby but not within the boundary of Comore Loma Water Corporation (CLWC). See attached Figure 2.

2. Project description
   The project is being proposed to bring the Comore Loma Water Corporation (CLWC) supply and distribution systems into compliance with current regulations for a 30 year planning period and make sure the water system has the ability to regulate pressures and capacity to meet maximum demand and fire flow requirements. Enclosed are three maps. The first two maps show the proposed project planning area and the area of potential effect. Each map depicts the proposed water system improvements. The third map depicts the location of the sole source aquifer boundary relative to Comore Loma. We have also attached information showing the capture zone of each Comore Loma well and nearby potential contaminate sources. We now describe the proposed water system improvements in more detail.

   - *Replace Tank 1 with a minimum 422,000 gal. tank.*
   - *Construct Tank 3 with a minimum storage of 533,000 gal.*
   - *Finish drilling Well 7 and construct the pump station. The test hole for this well has been completed and was finished at 730 feet deep. Expected production is +/- 1,000 gpm.*
   - *Construct new booster pump station adjacent to new Tank 1 to pump 1,725 gpm from Zone 1 to Zone 2*
   - *Complete the construction of the Big Bend booster pump station. The structure and underground piping for this building has already been completed.*
   - *Install transmission pipe from Zone 4 to Tank 3*
   - *Add flow meters to existing well pump stations at Well 2, Well 3, Well 4 and Well 5.*
   - *Add 24 fire hydrants at various locations in the distribution system*
   - *Replace broken distribution system valves. The locations are not entirely known at his point but will near intersections of existing distribution piping.*
   - *Purchase a portable generator and install manual switch gear for emergency use at booster pump station adjacent to Tank 1, Big Bend booster pump station and at one well.*
   - *Install water meter boxes and meters on service lines for each home*
   - *SCADA improvements to monitor flows from new flow meters at well houses, to obtain flow trend lines and to obtain flow totaling data.*

3. Is there any increase of impervious surface? If so, what is the area?
   The new booster pump station buildings (BPS at Tank 1 and Big Bend BPS) will add some impervious surface, approximately 900 sq. ft. per building for a total of 1,800 sq. ft. The new storage tanks (Tank 1 and Tank 3) will each be approximately 60 ft. dia., which will add 2,826 sq. ft. per tank for a total of 5,652 sq. ft. Tanks and booster pump stations together equals 7,452 sq. ft. of additional impervious area.

4. Describe how storm water is currently treated on the site?
   There are no stormwater collection or treatment works except for grading of soils around water system facilities. New construction under this project would be temporary

disturbance except for the facilities listed in Item 3 above. The facilities in Item 3 above will result in negligible changes to current stormwater conditions.

5. How will storm water be treated on this site during construction and after the project is complete?
   Applicable stormwater BMP's will be utilized for all construction activities. The impervious footprints of project improvements are small. What stormwater develops from increased impervious footprint would either be retained on site in graded swales or allowed to enter the borrow ditches on each side of the roads.

6. Are there any underground storage tanks present or to be installed? Include details of such tanks.
   The proposed project does not include any buried storage tanks. There are no known storage tanks within the proposed project planning area.

7. Will there be any liquid or solid waste generated? If so how will it be disposed of?
   There should be no generation of liquid or solid wastes.

8. What is the depth of excavation?
   A maximum of seven feet of excavation for typical water line installation is expected.

9. Are there any wells in the area that may provide direct routes for contaminates to access the aquifer and how close are they to the project?
   The wells in the project planning area are the five CLWC well and a test well for proposed Well 7. These wells are properly constructed and thus should have no effect on groundwater. All homes in the CLWC boundary are served water by CLWC. We are not aware of any individual wells in the planning area. If there are any individual wells they would be on private property and away from project work. The attached planning area map and the IDWR well database map shows the locations of system wells.

10. Are there any hazardous waste sites in the project area....especially if the waste site has an underground plume with monitoring wells that may be disturbed? Include details.
    There are no known hazardous waste sites within the boundaries of Comore Loma. We attached the Idaho DEQ source water assessment static map which shows the area where the wells draw their water from. Each well's area is limited to the area within the Comore Loma boundary except Well 6, which is shown with a very large uptake area. There appears to be no contaminant areas of concern located within the water system boundary.

11. Are there any deep pilings that may provide access to the aquifer?
    There is no planned use of pilings in the proposed project.

12. Are Best Management Practices planned to address any possible risks or concerns?
    Best management practices would be used in all construction activities.

13. Is there any other information that could be helpful in determining if this project may have an affect on the aquifer?

Do not know of any.

14. Does this Project include any improvements that may be beneficial to the aquifer, such as improvements to the wastewater treatment plan?
    The project will benefit the aquifer by improving drinking water system management which should save water use and power.

The EPA Sole Source Aquifer Program may request additional information if impacts to the aquifer are questionable after this information is submitted for review.

Submit copy to: Susan Eastman,(Eastman.Susan@epa.gov) Sole Source Aquifer Region 10 EPA, 1200 Sixth Ave, Suite 900, OWW-136 Seattle, WA 98101

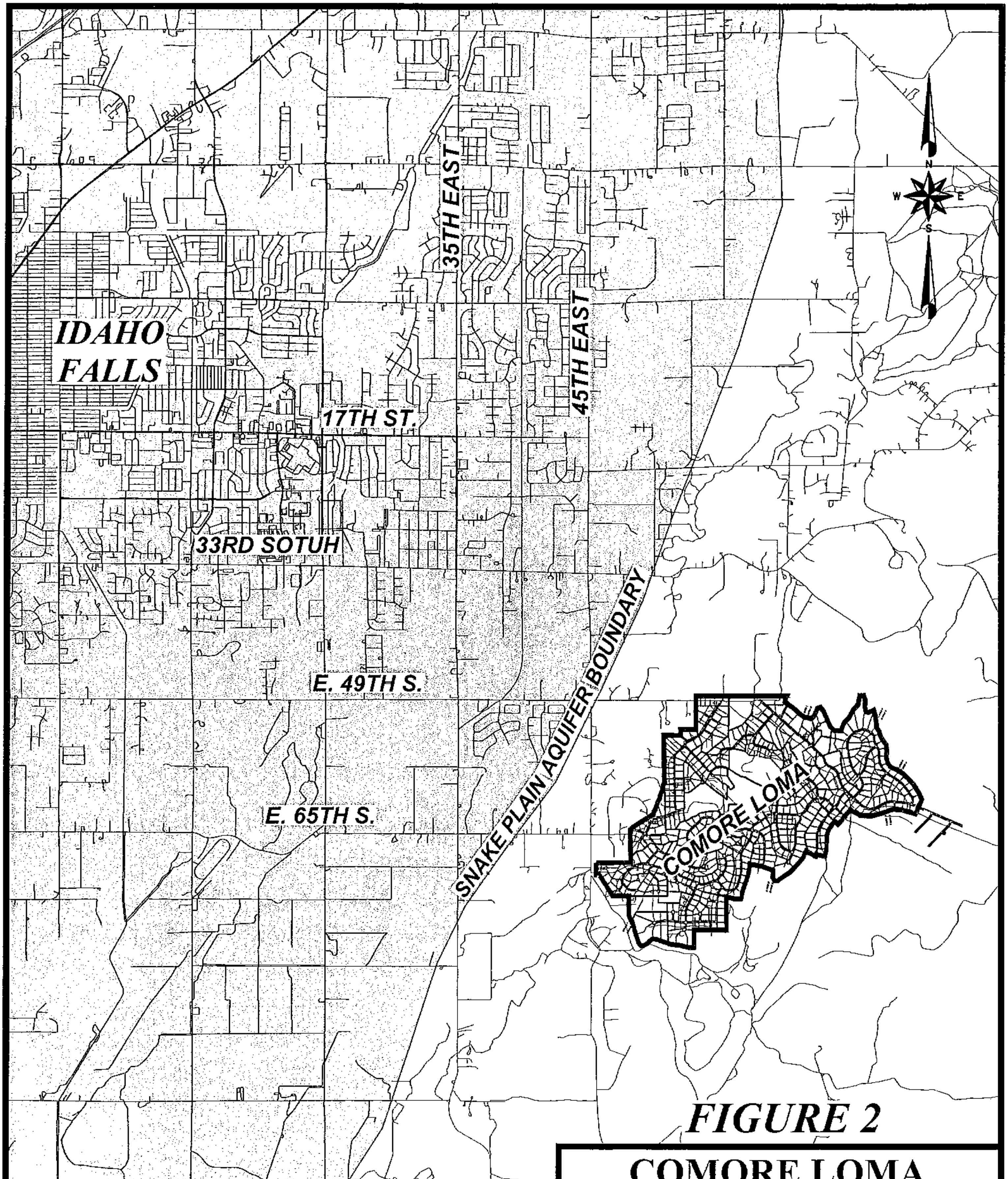


FIGURE 2

COMORE LOMA

Snake Plain Aquifer Boundary

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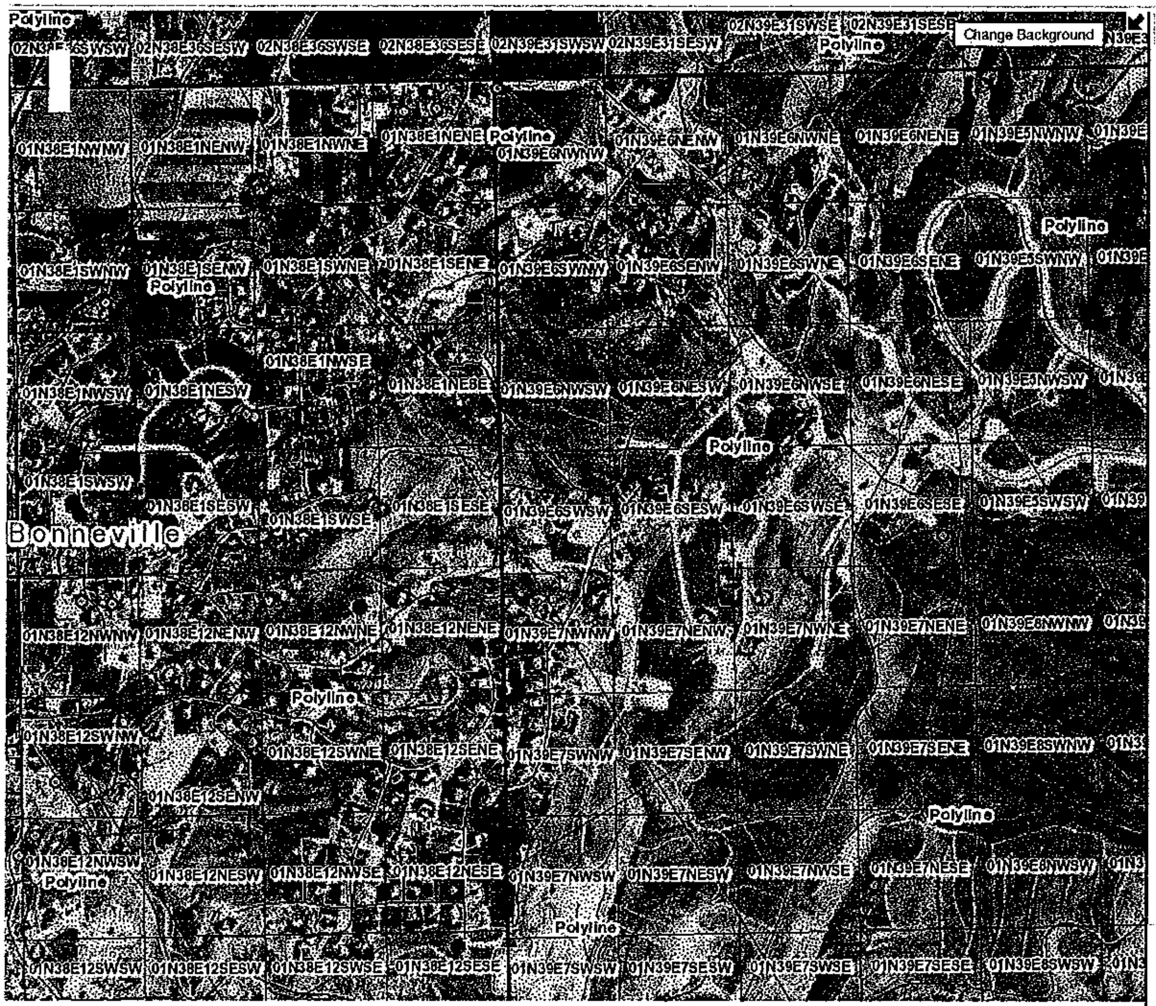
Idaho Falls 522-1244 Rexburg 356-6092

IDAHO Department of Water Resources
General Mapping Tool

Home
Contact Us



Layers | Legend

Water
- Wells

Water Rights / Adjudication
- POD - Adjudication Claims
- POD - Adjudication Recommendations
- POD - Permits
- POD - Water Rights
- POU - Adjudication Claims
- POU - Adjudication Recommendations
- POU - Permits
- POU - Water Rights

Ground Water
- Areas of Drilling Concern
- Contamination Area
- Nitrate Priority Areas
- Critical Ground Water Areas
- Ground Water Management Areas

Eastern Snake Plain Aquifer
- ESPA Boundary
- ESPA Model Outline
- ESPA Model Grid

Minimum Flows and Levels
- Minimum Stream Flow Points
- Minimum Stream Flow
- Minimum Lake Level

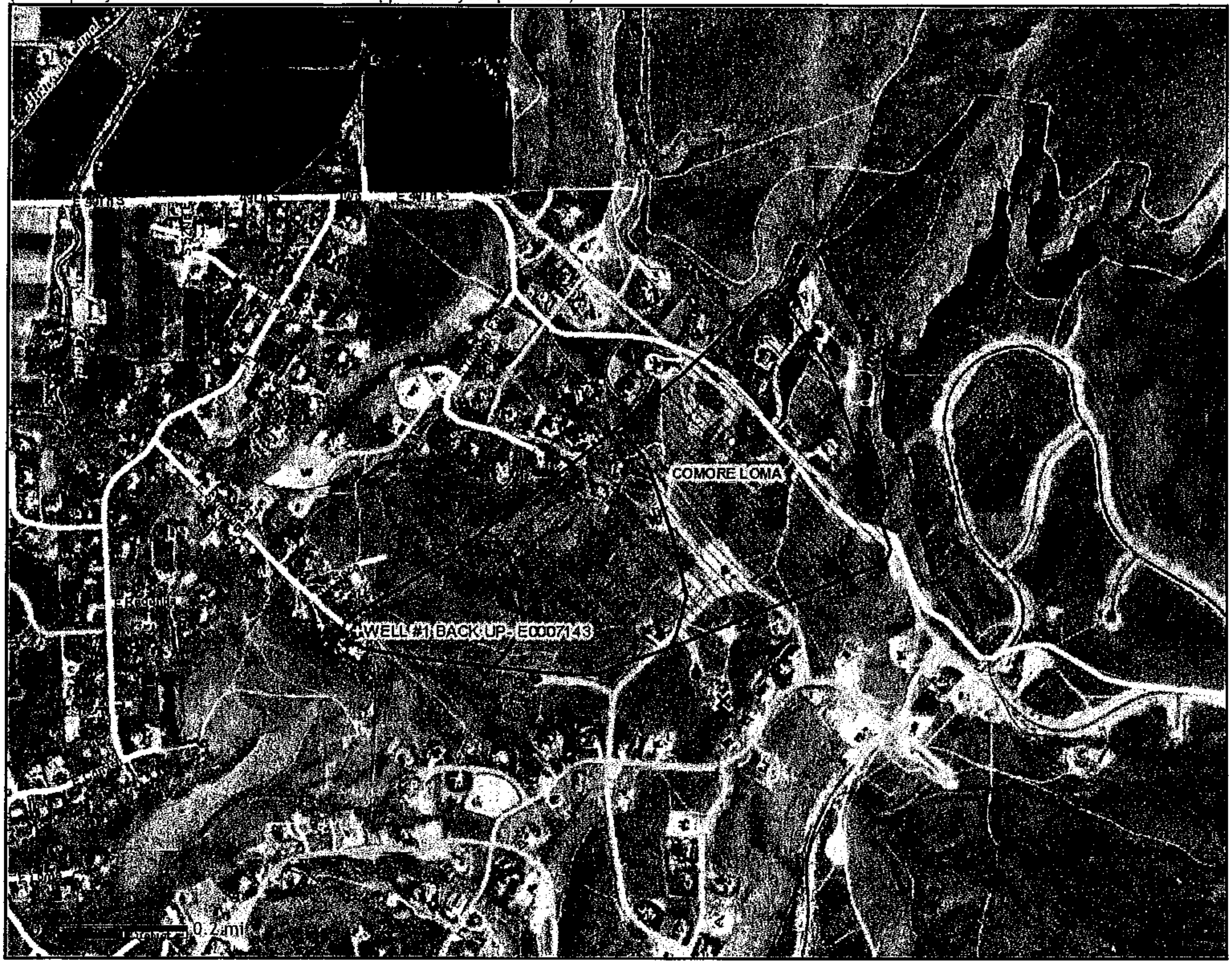
SELECT ACTIVE LAYER
Wells

0 420meters

2669346; 1361899

Public Water System Name: COMORE LOMA
Source Name: WELL #1 BACK UP
The public water system is not located within a nitrate priority area.

Submit a Comment
Click for dynamic map.
Save Map.
(This map may take several seconds to load. We appreciate your patience.)



ublic Water System Name: COMORE LOMA
ource Name: WELL #2
he public water system is not located within a nitrate priority area.

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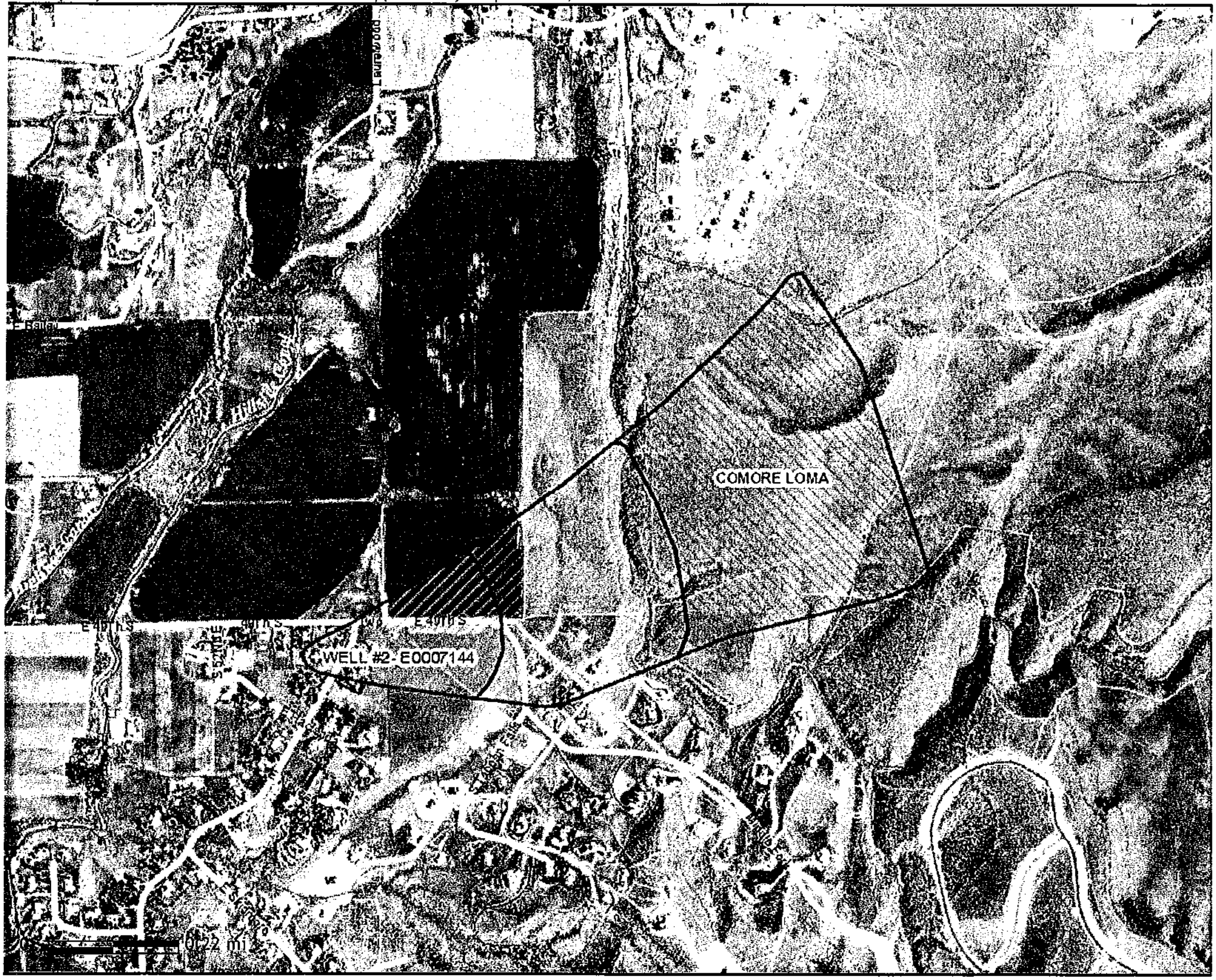
ubmit a Comment
lick for dynamic map.
ave Map.
'his map may take several seconds to load. We appreciate your patience.)



ublic Water System Name: COMORE LOMA
ource Name: WELL #3
he public water system is not located within a nitrate priority area.

ubmit a Comment
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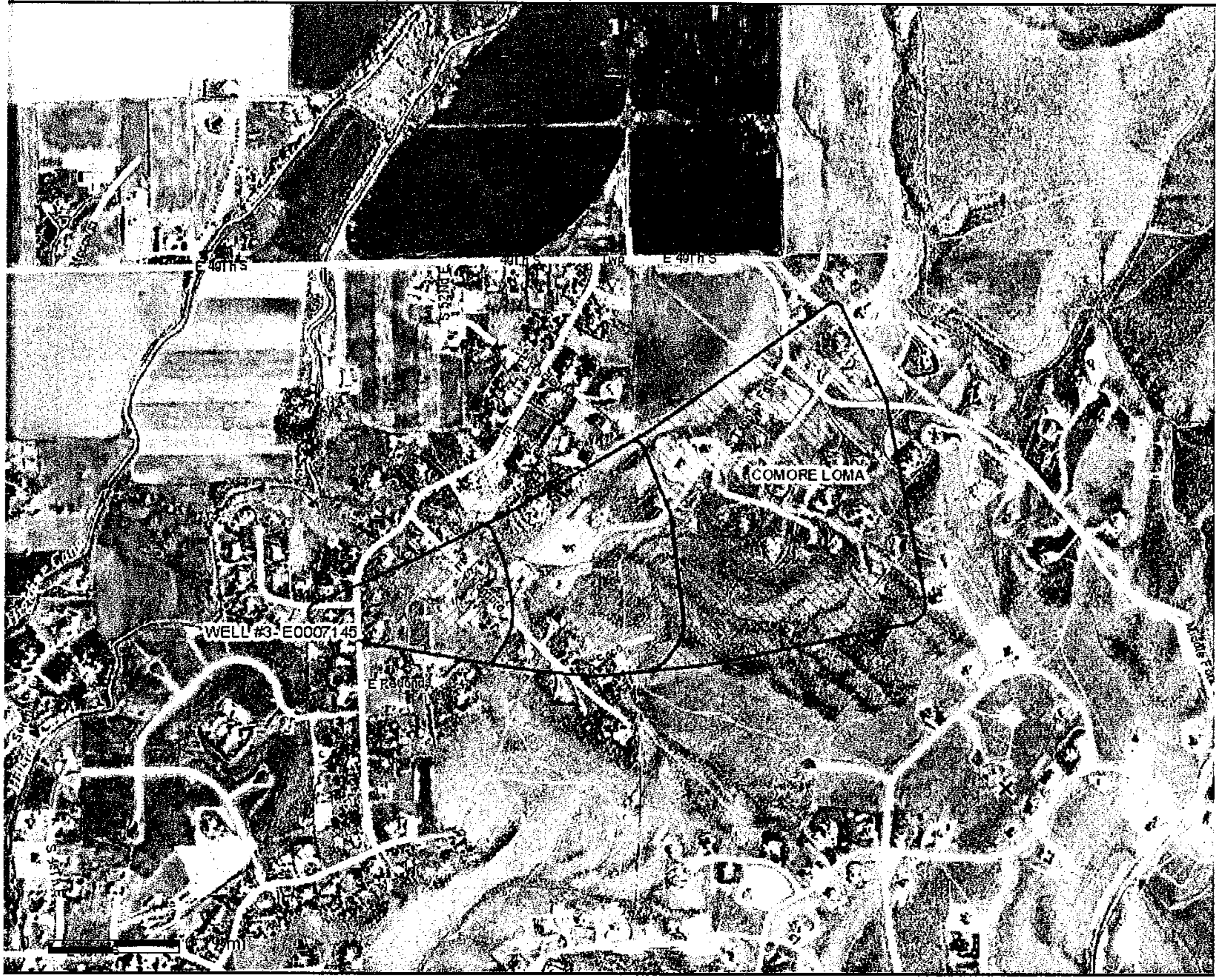
ave Map.
This map may take several seconds to load. We appreciate your patience.)



ublic Water System Name: COMORE LOMA
ource Name: WELL #4
he public water system is not located within a nitrate priority area.

---

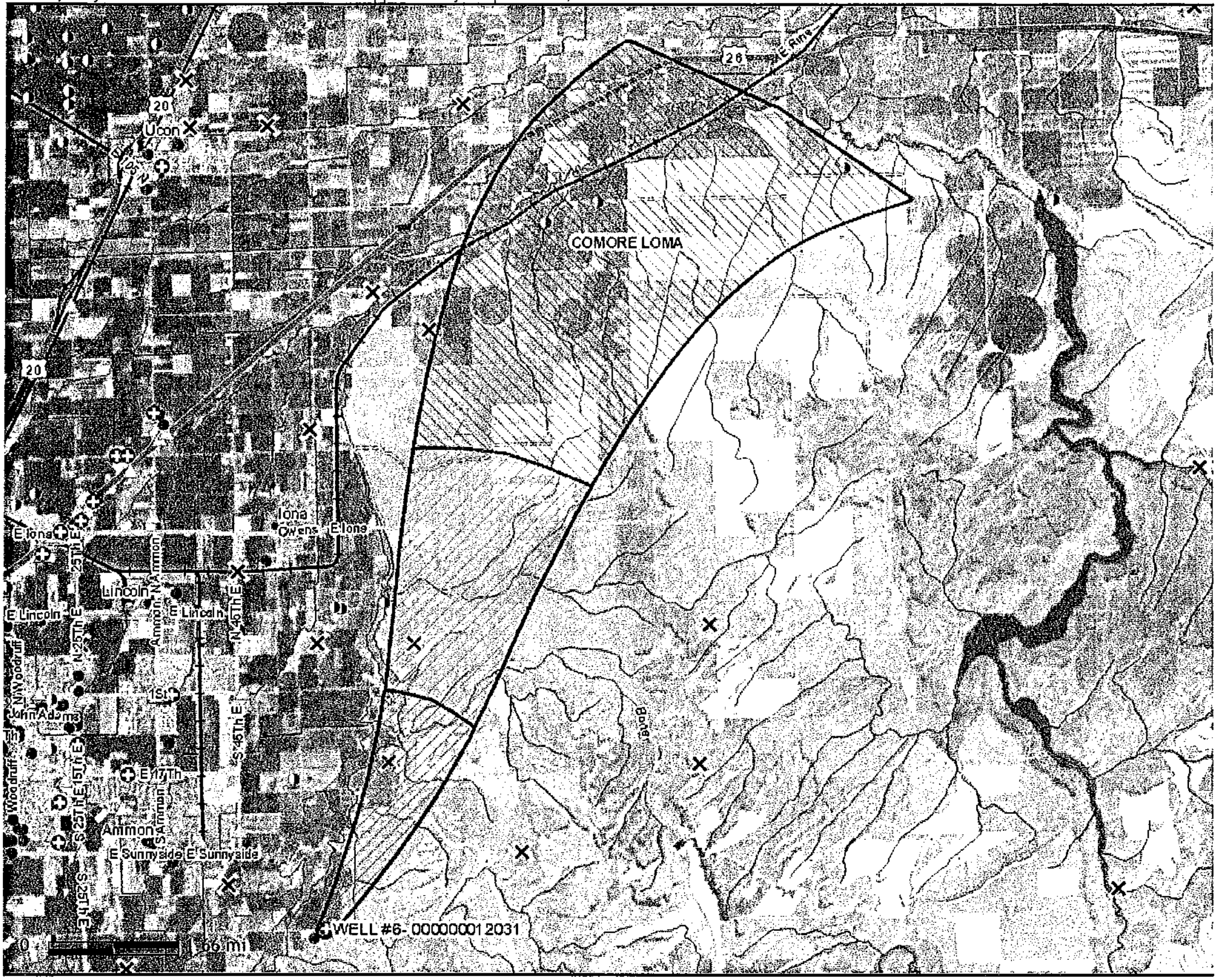
ubmit a Comment
lick for dynamic map.
ave Map.
his map may take several seconds to load. We appreciate your patience.)

ublic Water System Name: COMORE LOMA
ource Name: WELL #5
he public water system is not located within a nitrate priority area.

ubmit a Comment
lick for dynamic map.
ave Map.
'his map may take several seconds to load. We appreciate your patience.)

ublic Water System Name: COMORE LOMA
ource Name: WELL #6
he public water system is not located within a nitrate priority area.

ubmit a Comment
lick for dynamic map.
ave Map.
'his map may take several seconds to load. We appreciate your patience.)



Gmail by Google

Annalyn Jensen <clerk@schiesseng.com>

Agency Response Letters for Comore Loma

1 message

Annalyn Jensen <clerk@schiesseng.com> Tue, Feb 18, 2014 at 10:37 AM
To: James.M.Joyner@usace.army.mil, William Teuscher <william.teuscher@deq.idaho.gov>, rensay.pwen@deq.idaho.gov, Ethan.Morton@ishs.idaho.gov, eastman.susan@epamail.epa.gov, Werntz.James@epamail.epa.gov, keri.sigman@idwr.idaho.gov, keager@phd7.idaho.gov
Cc: Paul Scoresby <pscoresby@schiesseng.com>

Good Morning,

We have mailed out letters requesting comments on February 14, 2014 regarding the Comore Loma proposed water system improvements project. We have received questions about a statement stating "Install transmission pipe from Zone 4 to Tank 3." Please delete this statement and put in its place "Connect Tank 3 to the distribution line on the upper part of Middle Fork Drive."

If you have any questions please contact Paul Scoresby at 208-522-1244 or by email at pscoresby@schiesseng.com.

Thank you,

--

Annalyn Jensen
Schiess & Associates
7103 South 45th West | Idaho Falls, Idaho 83402
Phone 208-522-1244 | Fax 208-522-9232

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706 • (208) 373-0502

C.L. "Butch" Otter, Governor
Curt Fransen, Director

February 19, 2014

Certified Mail No: 7012 3050 0001 2126 2783

Nisa Marks
Eastern Idaho Field Office
U.S. Fish and Wildlife Service
4425 Burley Dr., Suite A
Chubbuck, Idaho 83202

RE: Comore Loma Water Corporation Drinking Water Improvement Project – Request for Comments for Preparation of an Environmental Information Document

Dear Ms. Marks:

The Comore Loma Water Corporation is in the final planning phase of developing a drinking water improvement project which could be in full or partially funded by the Idaho Drinking Water Revolving Loan Fund. The purpose of this letter is to request your review and response regarding any environmental impacts that the U.S. Fish and Wildlife Services may identify for this proposed project pursuant to the Idaho Department of Environmental Quality's State Environmental Review Process the state's National Environmental Policy Act-like process.

The proposed project is located in Bonneville County, southeast of the City of Ammon, and consists of the following:

- Replacement of tank 1 and construction of a new booster pump station adjacent to tank 1
- Construction of a new tank (tank 3)
- Connect tank 3 to the existing distribution line on the upper section of Middle Fork Drive
- Completion of well 7
- Completion of the Big Bend Drive booster pump station (underground piping already completed)
- Installation of 24 fire hydrants throughout the subdivision
- Installation of flow meters to the existing well pump stations
- SCADA improvements
- Replacement of broken system valves throughout the subdivision
- Acquisition of a portable generator

The project is being proposed to eliminate system deficiencies, provide current required fire flow, and improve storage and pumping. Enclosed is a map of the proposed project planning area that depicts the proposed project improvements and area of potential effect for all construction activities.

We request that you advise us of any comments that you may have regarding this project within 30 days, so the Comore Loma Water Corporation can proceed with the completion of the Environmental Information Document.

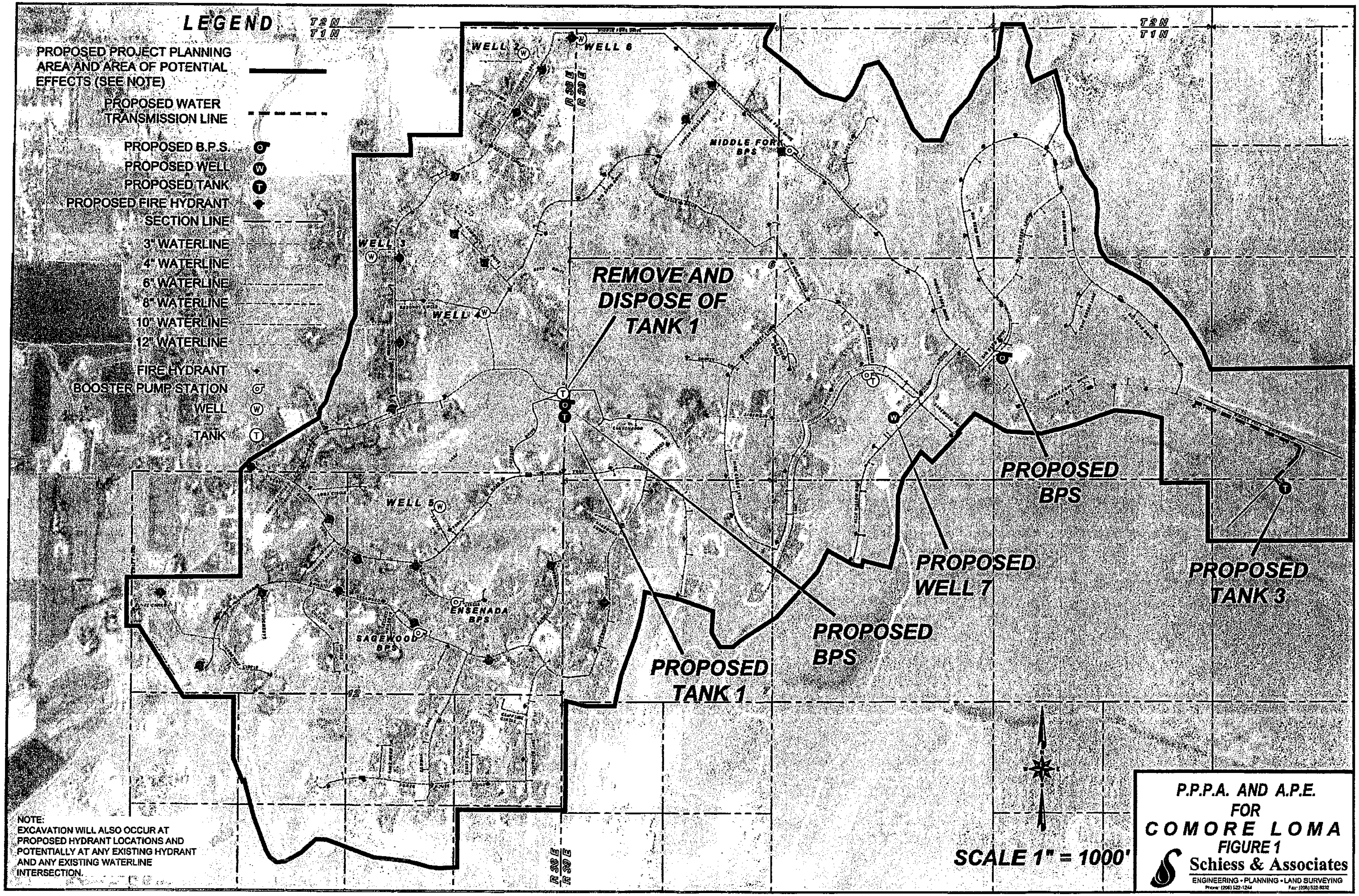
If you have any questions concerning this proposed project or if you need any further information, please feel free to contact Ester Ceja at 208-373-0585 or at Ester.Ceja@deq.idaho.gov at your convenience.

Sincerely,

Ester Ceja
Sr. Water Quality Analyst

EC:dls

Encl: Map
U.S. Fish and Wildlife Listed Species


LEGEND
PROPOSED PROJECT PLANNING AREA AND AREA OF POTENTIAL EFFECTS (SEE NOTE)
PROPOSED WATER TRANSMISSION LINE
PROPOSED B.P.S.
PROPOSED WELL
PROPOSED TANK
PROPOSED FIRE HYDRANT
SECTION LINE
3" WATERLINE
4" WATERLINE
6" WATERLINE
8" WATERLINE
10" WATERLINE
12" WATERLINE
FIRE HYDRANT
BOOSTER PUMP STATION
WELL
TANK
T2N
T1N
R 38 E
R 39 E
WELL 2
WELL 6
WELL 3
WELL 4
WELL 5
MIDDLE FORK BPS
ENSENADA BPS
SAGEWOOD BPS
REMOVE AND DISPOSE OF TANK 1
PROPOSED BPS
PROPOSED WELL 7
PROPOSED TANK 3
PROPOSED BPS
PROPOSED TANK 1
NOTE:
EXCAVATION WILL ALSO OCCUR AT PROPOSED HYDRANT LOCATIONS AND POTENTIALLY AT ANY EXISTING HYDRANT AND ANY EXISTING WATERLINE INTERSECTION.
SCALE 1" = 1000'
P.P.P.A. AND A.P.E. FOR COMORE LOMA
FIGURE 1
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This species list was revised by the USFWS on 10/23/2013, and is valid for 90 days after 02/12/2014.

U.S. Fish and Wildlife Service • Idaho Fish and Wildlife Office

CANDIDATE, PROPOSED AND LISTED SPECIES & PROPOSED AND DESIGNATED CRITICAL HABITAT IN IDAHO

	Herps	Birds		Mammals						Fish		Mollusks				Plants							
Common Name	Columbia Spotted Frog (Great Basin Population)	Greater Sage-Grouse	Yellow-Billed Cuckoo	Canada Lynx	Grizzly Bear	Northern Idaho Ground Squirrel	Selkirk Mountains Woodland Caribou	Southern Idaho Ground Squirrel	North American Wolverine	Bull Trout	Kootenai River White Sturgeon	Banbury Springs Lanx	Bliss Rapids Snail	Bruneau Hot Springsnail	Snake River Physa	Goose Creek Milkvetch	MacFarlane's Four-O'Clock	Packard's Milkvetch	Slickspot Peppergrass	Spalding's Catchfly	Ute Ladies'-Tresses	Water Howellia	Whitebark Pine
Scientific Name	*Rana luteiventris*	*Centrocercus urophasianus*	*Coccyzus americanus*	*Lynx canadensis*	*Ursus arctos horribilis*	*Spermophilus brunneus brunneus*	*Rangifer tarandus caribou*	*Spermophilus brunneus endemicus*	*Gulo gulo luscus*	*Salvelinus confluentus*	*Acipenser transmontanus*	*Lanx sp.*	*Taylorconcha serpenticola*	*Pyrgulopsis bruneauensis*	*Haitia (Physa) natricina*	*Astragalus anserinus*	*Mirabilis macfarlanei*	*Astragalus cusickii var. packardiae*	*Lepidium papilliferum*	*Silene spaldingii*	*Spiranthes diluvialis*	*Howellia aquatilis*	*Pinus albicaulis*
Ada		C	P							T					E				P-PCH				
Adams		C		T		T		C	P	T-DCH													C
Bannock		C	P						P														
Bear Lake		C		T					P														
Benewah				T					P	T-DCH										T		T	
Bingham		C	P						P												T		
Blaine		C	P	T					P	T-DCH													C
Boise			P	T					P	T-DCH													C
Bonner				T	T		E		P	T-DCH													C
Bonneville		C	P	T	T				P												T		C
Boundary				T-DCH	T		E-DCH		P	T-DCH	E-DCH												C
Butte		C		T					P	T-DCH													C
Camas		C	P	T					P	T-DCH													C
Canyon															E				P-PCH				
Caribou		C		T					P														
Cassia		C	P												E	C							
Clark		C	P	T	T				P														C
Clearwater				T					P	T-DCH													C
Custer		C	P	T					P	T-DCH													C
Elmore		C	P	T					P	T-DCH			T		E				P-PCH				C
Franklin		C		T					P														
Fremont		C	P	T	T				P												T		C
Gem		C						C	P	T-DCH									P-PCH				C

Table Key: C = Candidate Species P= Proposed Species T=Threatened Species E=Endangered Species PCH= Proposed Critical Habitat DCH=Designated Critical Habitat

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706 • (208) 373-0502

C.L. "Butch" Otter, Governor
Curt Fransen, Director

February 19, 2014

Certified Mail No: 7012 3050 0001 2126 2790

Carolyn Boyer-Smith
Cultural Resources Program
Shoshone-Bannock Tribes
P.O. Box 306
Fort Hall, Idaho 83203

RE: Comore Loma Water Corporation Drinking Water Improvement Project – Request for Comments for Preparation of an Environmental Information Document

Dear Ms. Boyer-Smith:

The Comore Loma Water Corporation is in the final planning phase of developing a drinking water improvement project which could be in full or partially funded by the Idaho Drinking Water Revolving Loan Fund. The purpose of this letter is to request your review and response regarding any historic and cultural resource impacts that the Shoshone-Bannock Tribes may identify for this proposed project pursuant to the Idaho Department of Environmental Quality's State Environmental Review Process, which mirrors the National Environmental Policy Act.

The proposed project is located southeast of the City of Ammon and consists of the following:

- Replacement of tank 1 and construction of a new booster pump station adjacent to tank 1
- Construction of a new tank (tank 3)
- Connect tank 3 to the existing distribution line on the upper section of Middle Fork Drive
- Completion of well 7
- Completion of the Big Bend Drive booster pump station (underground piping already completed)
- Installation of 24 fire hydrants throughout the subdivision
- Installation of flow meters to the existing well pump stations
- SCADA improvements
- Replacement of broken system valves throughout the subdivision
- Acquisition of a portable generator

The project is being proposed to eliminate system deficiencies, provide required fire flows, and improve storage and pumping. Enclosed is a map of the proposed project planning area that depicts the proposed project improvements and area of potential effect for all construction activities.

We request that you advise us of any comments that you may have regarding this project within 30 days, so the Comore Loma Water Corporation can proceed with the completion of the Environmental Information Document.

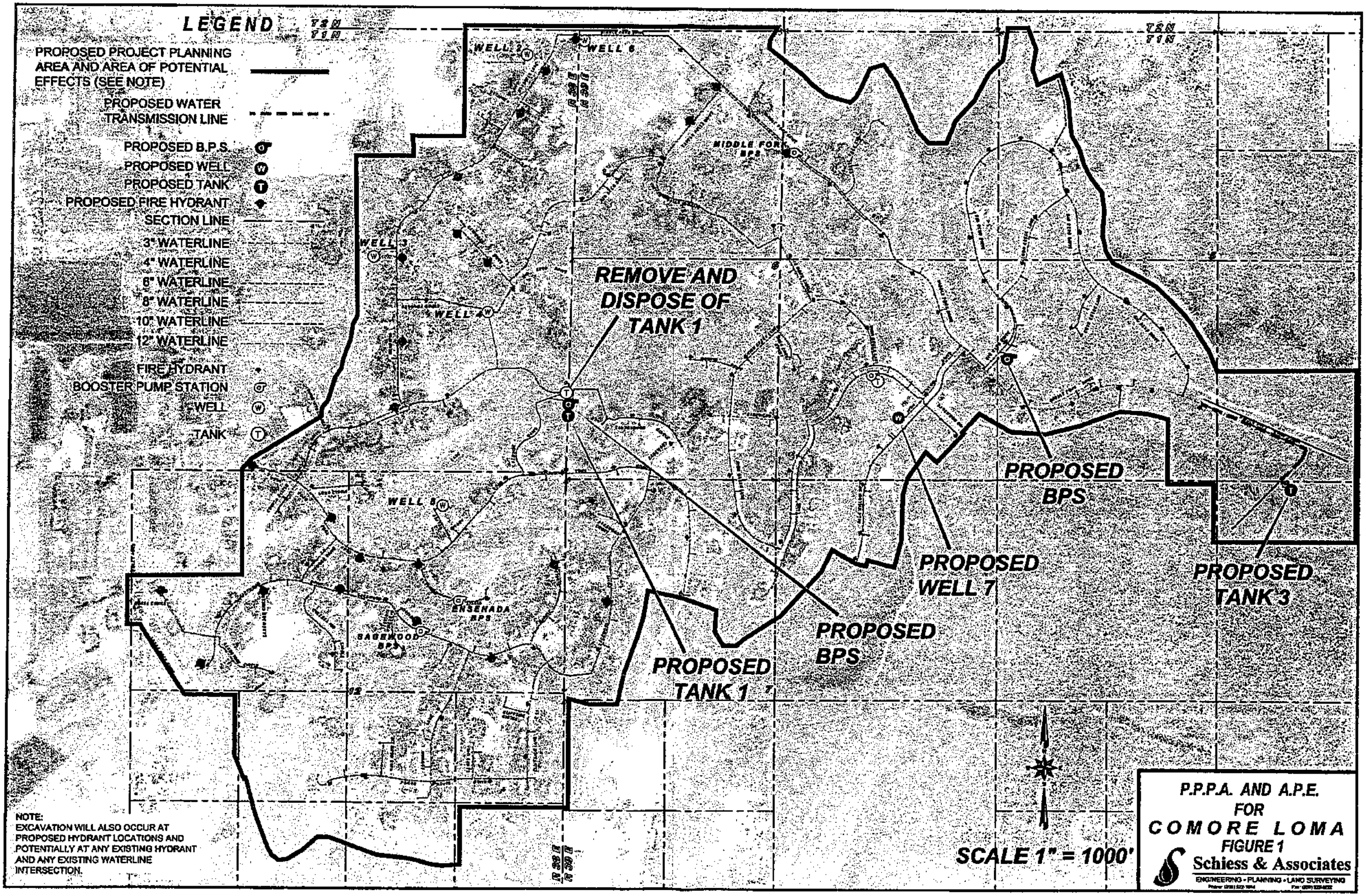
If you have any questions concerning this proposed project or if you need any further information, please feel free to contact Ester Ceja, 208-373-0585, or via email at Ester.Ceja@deq.idaho.gov at your convenience.

Sincerely,

Ester Ceja
Sr. Water Quality Analyst

EC:dls

Encl: map


LEGEND
PROPOSED PROJECT PLANNING AREA AND AREA OF POTENTIAL EFFECTS (SEE NOTE)
PROPOSED WATER TRANSMISSION LINE
PROPOSED B.P.S.
PROPOSED WELL
PROPOSED TANK
PROPOSED FIRE HYDRANT
SECTION LINE
3" WATERLINE
4" WATERLINE
6" WATERLINE
8" WATERLINE
10" WATERLINE
12" WATERLINE
FIRE HYDRANT
BOOSTER PUMP STATION
WELL
TANK
WELL 3
WELL 6
WELL 5
MIDDLE FORK BPS
ENSENADA BPS
SAGEWOOD BPS
REMOVE AND DISPOSE OF TANK 1
PROPOSED TANK 1
PROPOSED BPS
PROPOSED WELL 7
PROPOSED BPS
PROPOSED TANK 3
SCALE 1" = 1000'
NOTE:
EXCAVATION WILL ALSO OCCUR AT PROPOSED HYDRANT LOCATIONS AND POTENTIALLY AT ANY EXISTING HYDRANT AND ANY EXISTING WATERLINE INTERSECTION.
P.P.P.A. AND A.P.E.
FOR
COMORE LOMA
FIGURE 1
Schiess & Associates
ENGINEERING • PLANNING • LAND SURVEYING

STATE OF IDAHO
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ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706 • (208) 373-0502

C.L. "Butch" Otter, Governor
Curt Fransen, Director

February 19, 2014

Certified Mail No: 7012 3050 0001 2126 2806

Ted Howard, Director
Cultural Resources Program
Shoshone Paiute Tribe
P.O. Box 219
Owyhee, Nevada 89832

RE: Comore Loma Water Corporation Drinking Water Improvement Project – Request for Comments for Preparation of an Environmental Information Document

Dear Mr. Howard:

The Comore Loma Water Corporation is in the final planning phase of developing a drinking water improvement project which could be in full or partially funded by the Idaho Drinking Water Revolving Loan Fund. The purpose of this letter is to request your review and response regarding any historic and cultural resource impacts that the Shoshone Paiute Tribe may identify for this proposed project pursuant to the Idaho Department of Environmental Quality's State Environmental Review Process, which mirrors the National Environmental Policy Act.

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The project is being proposed to eliminate system deficiencies, provide current required fire flow, and improve storage and pumping. Enclosed is a map of the proposed project planning area that depicts the proposed project improvements and area of potential effect for all construction activities.

We request that you advise us of any comments that you may have regarding this project within 30 days, so the Comore Loma Water Corporation can proceed with the completion of the Environmental Information Document.

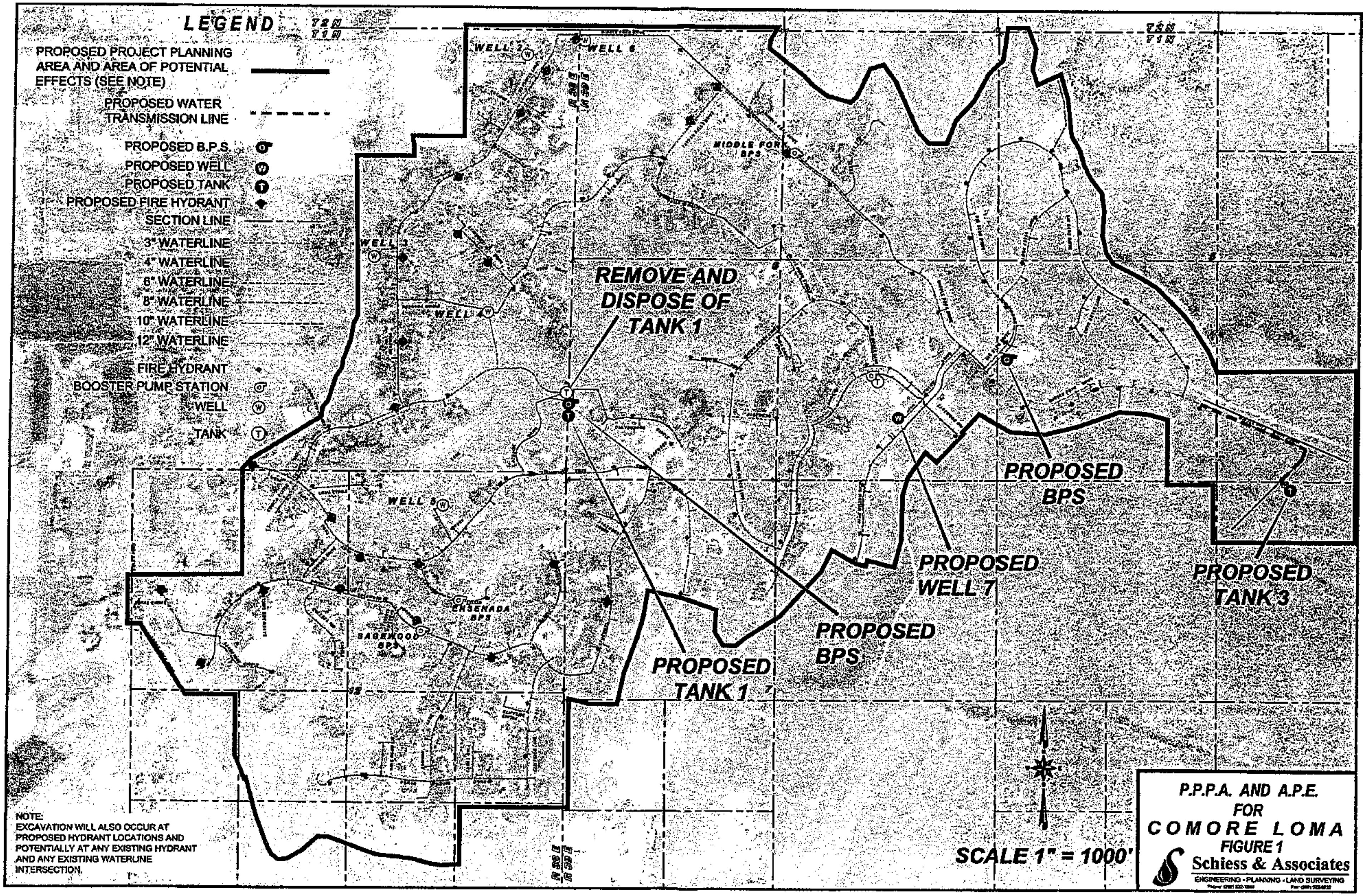
If you have any questions concerning this proposed project or if you need any further information, please feel free to contact Ester Ceja, 208-373-0585, or via email at Ester.Ceja@deq.idaho.gov at your convenience.

Sincerely,

Ester Ceja
Sr. Water Quality Analyst

EC:dls

Encl: map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P.P.P.A. AND A.P.E.
FOR
COMORE LOMA
FIGURE 1
Schiess & Associates
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Summary of Agency Reponses
Project Name: Comore Loma Drinking Water Facility Planning Study
Project #: 12076

Name	Representing	Consultation Date	Agency Repsonse	Comments
James Joyner	US Army Corps of Engineers	2/14/2014	3/28/2014	Project area consists of upland that has no waters of the US including Wetlands.
Willie Teascher	Idaho Falls Department of Environmental Quality	2/14/2014	3/7/2014	No significant impact on wastewater, water supply, surface water, storm water and air quality in general. To help protect water quality during construction the contractor will need to implement BMPs for storm water runoff.
Rensay Owen	Idaho Falls Department of Environmental Quality	2/14/2014	3/14/2014	Rensay initially suggested that the generator may be subject to state permitting under IDAPA 58.01.01. Follow up correspondance determined that the protable generator was exempt. We were also advised to control fugitive dust during construction phases of the project. No open burning of construction debris is allowed.
Ethan Morton	Idaho State Historical Society	2/14/2014	3/6/2014	Recommended a survey be conducted to be in compliance with the National Historic Preservation Act. Survey was conducted and no cultural resources were idenfied. Historical report recommended "no effect" finding. SHPO concurred with this recommendation. Work must be stopped if cultural resources are found during construction and SHPO and Shoshone-Bannock Tribes HeTO notified.
Susan Eastman	Environmental Assessment	2/14/2014	2/21/2014	The project will not have a significant adverse impact on the Eastern Snake River Plain Sole Source Aquifer.
Cyndi/ Grafe James Wentz	U.S. EPA, Idaho Operations Office	2/14/2014	(two emails) 2/25/2014	Stated concern that it was located in the Sole Source Aquifer and made sure that we made contact with Susan Eastman the Regional manager. We emailed back stating that it was not located in the Aquifer and sent them the same information that we email Susan Eastman.
Keri Sigman	Idaho Department of Water Resouces	2/14/2014	3/21/20114	Keri initially requested a GIS map of PPPA overlayed on a flood plain map. This was provided. Upon review, Keri determined there would be no construction within the 100 yr or 500 yr flood plain.

Kellye Eager	District 7 Health Department	2/14/2014	3/4/2014	Kellye requested additional information regarding Well 7 and the new transmission line making sure they were far enough way from septic tanks and drainfields. A follow up email was sent to Kellye illustrating that Well 7 would be outside of 100 foot minimum separation distance to nearest septic tank and drainfield. Information was sent illustrating Well 7 location was outside of 100 feet of nearest septic tank. As per Kelley's second comment, all water system piping was installed prior to plat approval and home construction.
David Kamworth	US Fish and Wildlife Service	2/18/2014	3/7/2014	Will have No effect on the Canada Lynx, Greater Sage-Grouse, Grizzly Bear, North American Wolverine, Whitebark Pine, Ute Ladies Tresses and Yellow-Billed Cuckoo. The project will also have no effect of the essential fish habitat where it is not located within Essential Fish Habitat.
Ted Howard	Shoshone-Paiute Tribe	2/18/2014		No Response
Carolyn Boyer Smith	Shoshone-Bannock Tribes	2/18/2014	3/21/2014	Trive desired to review historical report conducted to meet SHPO requirements. The historical report was sent to the Tribe including other requested information. We are awaiting final tribal comment.

DEPARTMENT OF THE ARMY
WALLA WALLA DISTRICT, CORPS OF ENGINEERS
IDAHO FALLS REGULATORY OFFICE
900 NORTH SKYLINE DRIVE, SUITE A
IDAHO FALLS, IDAHO 83402-1700

REPLY TO
ATTENTION OF

28 March 2014

Regulatory Division

SUBJECT: NWW-2014-86

Mr. Paul H. Scoresby
Schiess & Associates
7103 South 45th West
Idaho Falls, Idaho 83402

Dear Mr. Scoresby:

Enclosed is our Department of Army (DA) Approved Jurisdictional Determination (AJD) that there are no waters of the United States, including wetlands, that would be affected by the Comore Loma Water Improvement Project. Therefore, no DA authorization is required. This decision is based upon our review of the information you provided and additional information available to our office. Your project site is located near latitude 43.44038° N and longitude -111.9241° W, in Bonneville County, Idaho. Your request has been assigned file number NWW-2014-86, which should be referred to in future correspondence with our office regarding this site.

The DA exerts regulatory jurisdiction over waters of the United States (U.S.), including wetlands, pursuant to Section 404 of the Clean Water Act (33 U.S.C. 1344). Section 404 of the Clean Water Act requires a DA permit be obtained prior to discharging dredged or fill material into Waters of the U.S., which includes most perennial and intermittent rivers and streams, natural and man-made lakes and ponds, irrigation and drainage canals and ditches that are tributaries to other waters, and wetlands.

The proposed project components, as shown on the map attached to your 15 February 2014 letter, are locate in upland that does not contain waters of the U.S., including wetlands, under the Corps' regulatory jurisdiction. Therefore, a DA authorization is not required to develop the project.

This approved JD is valid for a period of 5-years from the date of this letter, unless new information supporting a revision is provided to this office before the expiration date. Also enclosed, you will find the Approved Jurisdictional Determination Form addressing wetlands and waters of the U.S. located within the JD review area, and a *Notification of Administrative Appeals Options and Process and Request for Appeal Form* (RFA) regarding this DA Approved Jurisdictional Determination. Should you disagree with certain terms and/or conditions this

Approved JD, the Notification of Administrative Appeal Options form outlines the steps to take to file your objection. Please note, the RFA form must be received by the Northwest Division Office no later than **27 May 2014**.

Nothing in this letter shall be construed as excusing you from compliance with other Federal, state, or local statutes, ordinances or regulations which may affect this work.

We are interested in your thoughts and opinions concerning the quality of service you received from the Walla Walla District, Corps of Engineers Regulatory Division. If you have Internet access, please visit our web site at http://per2.nwp.usace.army.mil/survey.html and complete an electronic version of our Customer Service Survey form, which will be automatically submitted to us. Alternatively, you may call and request a paper copy of the survey, which you may complete and return to us by mail. For additional information about the Walla Walla Regulatory please visit us at http://www.nww.usace.army.mil/BusinessWithUs/RegulatoryDivision.aspx. Your responses are appreciated and will allow us to improve our services.

If you have any questions about this determination, please contact me by telephone at (208) 522-1676, by mail at the address in the above letterhead, or via email at james.m.joyner@usace.army.mil. We appreciate your cooperation with the Corps of Engineers' Regulatory Program.

Sincerely,

James M. Joyner

James M. Joyner
Sr. Project Manager, Regulatory Division

Enclosures:
Approved JD Form
Notification of Administrative Appeal Options and Request for Appeal Form

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 28 March 2014

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Walla Walla District; NWW-2014-0086, Comore Loma Water Improvement Project

C. PROJECT LOCATION AND BACKGROUND INFORMATION: .

State: Idaho County/parish/borough: Bonneville City: near Idaho Falls
Center coordinates of site (lat/long in degree decimal format): 43.44038° Lat. -111.9241° Long.
Universal Transverse Mercator: Zone 11 Northing 4810135.28354291 N, Easting 425218.019617279 E.
Name of nearest waterbody: Gardner Canal
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: N/A
Name of watershed or Hydrologic Unit Code (HUC): Idaho Falls, Idaho.

☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☒ Office (Desk) Determination. Date: 28 March 2014
☐ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are no** "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]

☐ Waters subject to the ebb and flow of the tide.
☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain: .

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are no** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply): [1]

☐ TNWs, including territorial seas
☐ Wetlands adjacent to TNWs
☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
☐ Non-RPWs that flow directly or indirectly into TNWs
☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
☐ Impoundments of jurisdictional waters
☐ Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:
Non-wetland waters: linear feet: width (ft) and/or acres.
Wetlands: acres.

c. Limits (boundaries) of jurisdiction based on: **1987 Delineation Manual**
Elevation of established OHWM (if known): .

2. Non-regulated waters/wetlands (check if applicable):[3]

☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: .

---

[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**
   Identify TNW: .

   Summarize rationale supporting determination: .

2. **Wetland adjacent to TNW**
   Summarize rationale supporting conclusion that wetland is "adjacent": .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

   (i) General Area Conditions:
   Watershed size: **square miles**
   Drainage area: **acres**
   Average annual rainfall: inches
   Average annual snowfall: inches

   (ii) Physical Characteristics:
   (a) Relationship with TNW:
   ☐ Tributary flows directly into TNW.
   ☐ Tributary flows through **Pick List** tributaries before entering TNW.

   Project waters are **Pick List** river miles from TNW.
   Project waters are **Pick List** river miles from RPW.
   Project waters are **Pick List** aerial (straight) miles from TNW.
   Project waters are **Pick List** aerial (straight) miles from RPW.
   Project waters cross or serve as state boundaries. Explain: .

   Identify flow route to TNW[5]: .
   Tributary stream order, if known: .

---

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.
[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☐ Natural
☐ Artificial (man-made). Explain: .
☐ Manipulated (man-altered). Explain: .

Tributary properties with respect to top of bank (estimate):
Average width: feet
Average depth: feet
Average side slopes: **Pick List.**

Primary tributary substrate composition (check all that apply):

☐ Silts ☐ Sands ☐ Concrete
☐ Cobbles ☐ Gravel ☐ Muck
☐ Bedrock ☐ Vegetation. Type/% cover:
☐ Other. Explain: .

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: .
Presence of run/riffle/pool complexes. Explain: .
Tributary geometry: **Pick List**
Tributary gradient (approximate average slope): %

(c) Flow:

Tributary provides for: **Pick List**
Estimate average number of flow events in review area/year: **Pick List**
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: **Pick List.** Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .
☐ Dye (or other) test performed: .

Tributary has (check all that apply):
☐ Bed and banks
☐ OHWM[6] (check all indicators that apply):
☐ clear, natural line impressed on the bank ☐ the presence of litter and debris
☐ changes in the character of soil ☐ destruction of terrestrial vegetation
☐ shelving ☐ the presence of wrack line
☐ vegetation matted down, bent, or absent ☐ sediment sorting
☐ leaf litter disturbed or washed away ☐ scour
☐ sediment deposition ☐ multiple observed or predicted flow events
☐ water staining ☐ abrupt change in plant community
☐ other (list):
☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
☐ High Tide Line indicated by: ☐ Mean High Water Mark indicated by:
☐ oil or scum line along shore objects ☐ survey to available datum;
☐ fine shell or debris deposits (foreshore) ☐ physical markings;
☐ physical markings/characteristics ☐ vegetation lines/changes in vegetation types.
☐ tidal gauges
☐ other (list):

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: .
Identify specific pollutants, if known: .

---

[6]A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7]Ibid.

(iv) **Biological Characteristics. Channel supports (check all that apply):**
- ☐ Riparian corridor. Characteristics (type, average width): .
- ☐ Wetland fringe. Characteristics: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) **Physical Characteristics:**

(a) General Wetland Characteristics:

Properties:

Wetland size: acres

Wetland type. Explain: .

Wetland quality. Explain: .

Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:

Flow is: **Pick List**. Explain: .

Surface flow is: **Pick List**

Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .

☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:
- ☐ Directly abutting
- ☐ Not directly abutting
  - ☐ Discrete wetland hydrologic connection. Explain: .
  - ☐ Ecological connection. Explain: .
  - ☐ Separated by berm/barrier. Explain: .

(d) Proximity (Relationship) to TNW

Project wetlands are **Pick List** river miles from TNW.

Project waters are **Pick List** aerial (straight) miles from TNW.

Flow is from: **Pick List.**

Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) **Chemical Characteristics:**

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: .

Identify specific pollutants, if known: .

(iii) **Biological Characteristics. Wetland supports (check all that apply):**
- ☐ Riparian buffer. Characteristics (type, average width): .
- ☐ Vegetation type/percent cover. Explain: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: **Pick List**

Approximately ( ) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed: .

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: linear feet width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
- ☐ Tributary waters: linear feet width (ft).
- ☐ Other non-wetland waters: acres.
  Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
   ☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional waters within the review area (check all that apply):
   - ☐ Tributary waters: linear feet width (ft).
   - ☐ Other non-wetland waters: acres.
     Identify type(s) of waters: .

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
   - ☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

   - ☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
   ☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**
   As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
   - ☐ Demonstrate that impoundment was created from "waters of the U.S.," or
   - ☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
   - ☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]
- ☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
- ☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
- ☐ which are or could be used for industrial purposes by industries in interstate commerce.
- ☐ Interstate isolated waters. Explain: .
- ☐ Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

[8] See Footnote # 3.
[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
[10] **Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.***

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
☐ Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:PPPA and APE for Comore Loma, Figure 1 .
☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps: .
☐ Corps navigable waters' study: .
☐ U.S. Geological Survey Hydrologic Atlas: .
☐ USGS NHD data.
☐ USGS 8 and 12 digit HUC maps.
☒ U.S. Geological Survey map(s). Cite scale & quad name: 1:24K (Ammon) .
☒ USDA Natural Resources Conservation Service Soil Survey. Citation: NRCS (Web Soil Survey).
☒ National wetlands inventory map(s). Cite name: USFWS (Wetlands Mapper).
☐ State/Local wetland inventory map(s): .
☐ FEMA/FIRM maps: .
☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
☒ Photographs: ☒ Aerial (Name & Date): Google Earth and ORM Database Aerials.
or ☐ Other (Name & Date): .
☐ Previous determination(s). File no. and date of response letter: .
☐ Applicable/supporting case law: .
☐ Applicable/supporting scientific literature: .
☐ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD: :.

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: **Schiess & Associates**		File Number: **NWW-2014-0086**	Date: **28 Mar 2014**
Attached is:			See Section Below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of Permission)		A
	PROFFERED PERMIT (Standard Permit or Letter of Permission)		B
	PERMIT DENIAL		C
X	**APPROVED JURISDICTIONAL DETERMINATION**		**D**
	PRELIMINARY JURISDICTIONAL DETERMINATION		E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations (JD) associated with the permit.

OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit,

ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.

APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMT

REASONS FOR APPEAL OR OBJECTIONS:

Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:	If you only have questions regarding the appeal process you may also contact:
District Engineer ATTN: Ms. Kelly J. Urbanek Regulatory Division Walla Walla District 201 North 3rd Avenue Walla Walla, Washington 99362-1876 Telephone (208) 376-1832	U.S. Army Corps of Engineers Northwestern Division Attn: Mary Hoffman, Appeals Review Officer P.O. Box 2870 Portland, Oregon 97208-2870 Telephone (503) 808-3825

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

Signature of appellant or agent:	*Date:*	*Telephone:*

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

900 North Skyline Drive, Suite B • Idaho Falls, ID 83402 • (208) 528-2650

C. L. "Butch" Otter, Governor
Curt A. Fransen, Director

March 7, 2014

Paul Scoresby
Schiess & Associates
7103 South 45th West
Idaho Falls, ID 83402

Re: Comore Loma Drinking Water Improvement Project Environmental Review.

Dear Mr. Scoresby,

After review of the proposed project DEQ finds that the proposed drinking water improvement project will have no significant impact on wastewater, water supply, surface water, storm water and air quality in general. To help protect water quality during construction the contractor will need to implement the Best Management Practices (BMPs) for storm water runoff.

If you need additional information or have any questions please call.

Sincerely,

William Teuscher

William Teuscher PE
Water Quality Engineer
DEQ-IFRO

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

900 North Skyline Dr., Suite B • Idaho Falls, Idaho 83402 • (208) 528-2650
www.deq.idaho.gov

C.L. "Butch" Otter, Governor
Curt Fransen, Director

March 14, 2014

Paul H. Scoresby, P.E.
Schiess & Associates
7103 South 45th West
Idaho Falls, ID 83402

Subject: Air Quality Impact Review for Comore Loma Water Improvement Project

Dear Mr. Scoresby,

The Idaho Department of Environmental Quality (DEQ) has reviewed the information submitted regarding a construction project for the Comore Loma Water Corporation Water System Improvement Project with respect to potential Air Quality impacts in the region. DEQ appreciates your efforts to apprise our agency of the planned project activity.

It was noted during the review that Comore Loma intends to construct a facility that includes an emergency generator subject to IDAPA 58.01.01 Rules for the Control of Air Pollution. An evaluation should be conducted to determine the appropriate permitting status of the unit and to develop supporting documentation. While it may be determined the source is exempt from permitting requirements, it will still be subject to other rules under IDAPA 58.01.01.

Also, be advised that the control of fugitive dust during all phases of the project is required under Idaho law. This can be accomplished by covering loads, excavations and piles of excavated material or the application of dust suppressants, such as water, in quantities sufficient to prevent dirt and dust becoming airborne. Additionally, construction debris and other wastes are strictly prohibited from open burning and need to be properly accumulated and disposed in a licensed landfill. These aspects can present minor to significant problems within the region and are closely monitored and strictly enforced.

If you have further questions concerning this or other matters in our region, please call me at (208) 528-2650.

Respectfully,

Rensay Owen

Rensay Owen – Idaho Falls Regional Air, Waste and Remediation Manager
Idaho Falls Regional Office

Paul Scoresby <pscoresby@schiesseng.com>

Air Quality at Comore Loma

2 messages

Paul Scoresby <pscoresby@schiesseng.com> Mon, Mar 24, 2014 at 11:48 AM
To: rensay.owen@deq.idaho.gov

Rensay,

We are in receipt of your letter dated March 14, 2014 regarding Comore Loma Water Corporation's planned generator for their water improvements project. Perhaps more information about the proposed generator for Comore Loma Water Corporation would aid in determining whether the proposed generator needs a permit. We are expecting to use a generator in the range of 300 Hp. It is also planned to be a mobile unit to provide temporary power input two wells and a booster pump station for each pressure zone. I suppose this makes the generator exempt from permitting. Please comment back for documentation for the environmental review.

Sincerely,

--

Paul H. Scoresby, MS, PE

Schiess & Associates
7103 S. 45th W. I Idaho Falls, Idaho 83402
208-522-1244 I FAX 208-522-9232 I Cell 208-313-2454
pscoresby@schiesseng.com

Rensay.Owen@deq.idaho.gov <Rensay.Owen@deq.idaho.gov> Mon, Mar 24, 2014 at 12:02 PM
To: pscoresby@schiesseng.com

Paul,

Based on our conversation earlier today, I agree that a mobile generator of the size you mentioned would not fall under IDAPA 58.01.01 Rules.

Thank you for responding to my questions regarding the Comore Loma Project.

Rensay D. Owen

Regional Manager, Remediation, Waste and Air Quality

Idaho Falls Regional Office

Idaho Falls, Idaho

Idaho • State Historical SOCIETY

C.L. "Butch" Otter
Governor of Idaho

Janet Gallimore
Executive Director

Administration
2205 Old Penitentiary Road
Boise, Idaho 83712-8250
Office: (208) 334-2682
Fax: (208) 334-2774

Membership and Fund Development
2205 Old Penitentiary Road
Boise, Idaho 83712-8250
Office: (208) 514-2310
Fax: (208) 334-2774

Historical Museum and Education Programs
610 North Julia Davis Drive
Boise, Idaho 83702-7695
Office: (208) 334-2120
Fax: (208) 334-4059

State Historic Preservation Office and Historic Sites Archeological Survey of Idaho
210 Main Street
Boise, Idaho 83702-7264
Office: (208) 334-3861
Fax: (208) 334-2775

Statewide Sites:
• Franklin Historic Site
• Pierce Courthouse
• Rock Creek Station and
• Stricker Homesite

Old Penitentiary
2445 Old Penitentiary Road
Boise, Idaho 83712-8254
Office: (208) 334-2844
Fax: (208) 334-3225

Idaho State Archives
2205 Old Penitentiary Road
Boise, Idaho 83712-8250
Office: (208) 334-2620
Fax: (208) 334-2626

North Idaho Office
112 West 4th Street, Suite #7
Moscow, Idaho 83843
Office: (208) 882-1540
Fax: (208) 882-1763

March 5, 2014

Paul H. Scoresby, PE
Schiess & Associates
7103 South 45th West
Idaho Falls, ID 83402

RE: Comore Loma Water Improvement Project (Idaho SHPO REV 2014-453)

Dear Mr. Scoresby,

Thank you for your informational letter and project materials regarding the proposed project. Our preliminary review indicates that if the project receives federal funding through a grant from the Idaho Department of Environmental Quality or another federal agency it is an *undertaking* as defined by the National Historic Preservation Act (outlined in 36 CRF 800). In order to be in compliance with the National Historic Preservation Act we recommend that a survey be conducted to identify any *historic properties*, evaluate effects, and propose mitigation if warranted.

Because a significant amount of the area of potential effect has been previously disturbed we recommend that the survey should be limited to the portions of the project involving the removal and replacement of Tank 1, the installation of the water transmission line to the proposed Tank 3, and the location of Tank 3. The survey should be designed to provide a generous buffer zone to accommodate any minor changes in project design.

We appreciate your consulting with our office and look forward to receiving a report which documents the results of the survey and provides an overall recommendation regarding potential effects. A list of qualified consultants can be found on our website: http://www.preservationidaho.org/resources/cultural-resources-consultants**.** If you have any questions feel free to contact me at 208-334-3861 x107 or ethan.morton@ishs.idaho.gov.

Sincerely,

Ethan Morton

Ethan Morton
Archaeologist, Idaho State Historic Preservation Office

ARCHAEOLOGICAL AND HISTORIC SITES INVENTORY REPORT

Comore Loma Water Improvements Project
Bonneville County, Idaho

March 27, 2014

Prepared for:
Schiess & Associates
7103 South 45th West
Idaho Falls, ID 83402

Prepared by:
Stephanie Crockett, Cultural Resource Consulting
P.O. Box 126
Victor, Idaho 83455

ARCHAEOLOGICAL AND HISTORIC SITES SURVEY REPORT
IDAHO ARCHAEOLOGICAL SURVEY

A. Key Information

Project Name: Comore Loma Water Improvement Project
Report Numbers: 2014ID01 Record Search No. 14125
Associated Federal Agency: Idaho Department of Environmental Quality
Author: Stephanie Crockett
Date of Report: March 27, 2014
County: Bonneville
Legal Location: T1N R38E, Section 1 and T1N R39E, Sections 5 & 8
Acres Surveyed: ~ 6 (intensive)

B. Project Description:

The proposed undertaking is the **Comore Loma Water Improvement Project** in Bonneville County, Idaho. The property owners of the Comore Loma Subdivision near Idaho Falls, Idaho plan to replace a leaking, 1970s era concrete water tank (Tank 1) and install a new tank in its place or adjacent to the current location and install a new transmission line from Well No. 4 to the new tank. The transmission line will run in the general vicinity of the existing line to the well which is down slope and to the northwest of the tank (See Map). The maximum area of disturbance for the tank site will be no greater than one acre. There will be a 25 foot wide easement, with a probable disturbance corridor of three feet, for the transmission line. In addition, the installation of a new (Tank 3) and associated transmission line, are proposed for the eastern edge of the subdivision (See Map). The maximum area of disturbance for Tank 3 is one acre with a 25 foot easement for the transmission line with a probable disturbance corridor of no greater than three feet. The APE lies within the Comore Loma Subdivision on the eastern edge of Idaho Falls. The APE for Tank 1 is surrounded by mid-late 20th century homes, a cell tower, a late 20th century shed and fence as well as the existing 1970s era water tank. The APE for Tank 3 lies in the open sagebrush covered hillside above the existing housing development. There are no buildings in the vicinity of the APE for Tank 3 or its transmission line. Power lines were also observed in the vicinity. The inventory yielded no cultural materials 50 years or older within the APE and no historic or prehistoric properties exist within the view shed of the APE. Consequently, there will be no effect to National Register of Historic Places (NRHP) cultural properties as a result of this project.

C. Statement of Objectives

On March 20, 2014 an intensive pedestrian cultural resource inventory was conducted to identify, document and evaluate cultural properties within the APE in accordance with state and federal statutes and regulations, including Section 106 of the National Historic Preservation Act and its applicable guidelines (36 CFR 800). The APE consists of a sagebrush covered hillside overlooking the city of Idaho Falls and Ammon, Idaho. Due to the arid and exposed nature of the APE, historic farms, homesteads and properties associated with long term prehistoric hunter-gatherer camping activities were not predicted. The geography of the APE was appropriate for sites associated with hunting or large game processing and other traditional cultural practices by prehistoric hunter-gatherer populations.

D. Location and General Environmental Setting: (See Overview Map)

The APE lies within the Middle Rocky Mountain Physiographic Province, in southeastern Idaho. It can be found on the Ammon, Idaho USGS topographic map (1984). More specifically, it lies on the steep westerly slope of the rolling foothills of the Caribou Mountain Range overlooking the city of Idaho Falls and the Upper Snake River Plain. It lies at an elevation ranging from 4980 – 5660 feet above sea level. The deep silt soils are incised by seasonal drainages cut into the Aeolian surface. Few sub-angular gravels and pebbles were observed on the ground surface which supports a vegetative cover of big sagebrush, silver sagebrush, rabbit brush, cheat grass, yarrow, cryptobiotic soils and other mixed bunch grasses. Ground visibility at the time of inventory ranged from 50 – 70%. The weather at the time of inventory was cool and windy.

E. Pre-Field Research

1. Sources of information checked:

On March 19, 2014 a search of the Idaho State Historic Preservation Office records in Boise was conducted (#14125). The following sources of information were checked:

[X] Cultural Overviews	[X] Ethnographic Studies
[X] National Register	[X] Historical Records
[X] Archaeological Site Records	[] Individuals or Groups
[X] Maps	[] GLO Plats
[X] Survey Records	[] Mineral Maps
	[] Forest Road & Trail Maps

2. Summary of previous studies in this general area

Crockett, S.

2007 City of Ammon Water Improvements Project, Bonneville County, ID. Environmental Protection Agency. Acreage: 5 (intensive) in T2N R39E Section 31.

Falkner, M.

2010 Goshen North Wind Resource Area, Bonneville County. HRA Missoula MT. Acres: 741(intensive) in T2N R39E Section 33.

Gough, Stan

1990 Cultural Resource Investigations of the Bonneville Power Administration's Goshen-Drummond No. 1 Transmission Line, Southeastern Idaho. Department of Energy. Rpts in Arch/Hist 100-68. Arch & Hist. services Eastern Washington University. Acreage: 1875 acres (intensive) in T1N R39E Sections 4, 5, 7 and T2N R39E Section 33.

Harding, William and Rusty Smith

2013 Blackhawk Homeowner's Association Drinking Water Facility Improvement Project, Bonneville, County. Environmental Protection Agency. Acreage: Unknown, in T1N R38E Section 12.

SERG Inc.
2004 Ammon/Shelley Regional Wastewater Project, Prepared for East Central Idaho Planning and Development, Rexburg, ID. Acreage: 422 (intensive), 185 (reconnaissance) in T1N R38E Section 2 and T2N R38E Section 35.

Other References Cited

Crowder, David L.
1983 Rexburg, Idaho: The First One Hundred Years 1883 – 1983. Caxton Printers Ltd. Caldwell, Idaho.

Haines, Aubrey eds.
1955 Osborne Russell's Journal of a Trapper. University of Nebraska Press, Lincoln, Nebraska

F. Expected Historic and Prehistoric Land Use and Site Sensitivity:

The Upper Snake River Plain was an important travel and trade route in the early 19th century. The European market for beaver pelts and the American exploration of the Rocky Mountain region brought explorers, trappers and local Indian tribes to various locations along the Snake River Plain (Haines 1955). Settlers began arriving in the mid-late 1800s and by 1878 the Utah Northern Railroad (Union Pacific) had reached Fort Hall Indian Reservation and the nearby town of Blackfoot. Employment on the railroad brought more settlers to the region. Homesteaders began bringing irrigation canals, agriculture and ranching to the region (Crowder 1983). Just two cultural properties have been previously recorded within the vicinity of the APE. These are historic potato cellars associated with agriculture during the early 20th Century. Although no previously recorded sites are known within the APE, sites associated with historic agriculture and settlement and evidence for prehistoric hunter-gatherer activities was sought.

G. Field Methods

1. Areas examined and type of coverage:

On March 20, 2014 an intensive pedestrian inventory was conducted over the entire APE. This consisted of two parallel transects spaced no greater than 10 meters apart along the proposed transmission lines for Tank 1 and Tank 3 and meandering transects spaced no greater than 30 meters apart across the entirety of the APE for Tank 1 and Tank 3 (See Map). A Garmin 12 GPS unit (NAD 83 Datum) was used to mark the APE. Photographs were taken using a Canon Power Shot A1100IS digital camera and detailed notes were taken pertaining to soils, vegetation and weather.

2. Ground Surface Conditions:

Ground visibility was good at the time of inventory. The APE did not appear to have been cultivated although prior ground disturbance for the installation of Tank 1 and its transmission line was noted. A two-track road runs parallel to the proposed transmission line and tank location for Tank 3. This afforded additional ground surface visibility. The weather at the time of inventory was cool and windy.

3. Acres Surveyed: **Reconnaissance** 0
Intensive ~ 6

4. Areas not examined and reasons why: The entire APE was examined.

5. Personnel conducting or assisting in the survey: S. Crockett

6. Dates of Survey: March 20, 2014

7. Problems Encountered: None

H. Results

1. All cultural resources recorded for this area: (See Overview Map)
No cultural properties were recorded as a result of this inventory. Two historic potato cellars (19-18034 and 19-18035) and one prehistoric isolate (10BV241) were previously recorded approximately one mile from the APE for Tank 1 and more than two miles from the APE for Tank 3. None of these properties are visible from either tank location as they are on the valley floor.

2. Cultural Resources noted but not formally recorded: Within the APE for Tank 1 a small corral and shed (early 1980s era); a cell tower with associated shed (21^{st} Century) and Tank 1 itself (mid 1970s era) were noted. Power lines were noted crossing and parallel to the APE for both Tank 1 and Tank 3. As these features are not 50 years old or greater they were not formally recorded.

I. Conclusions and Recommendations:

No cultural materials were documented within the APE as a result of this inventory and no previously recorded cultural properties exist within the APE or its view shed. Consequently, there will be no direct effect to NRHP cultural properties nor will there be any visual or audible effect as a result of this project. Due to good ground visibility at the time of inventory, the probability for undetected cultural materials is low. If undetected cultural materials are encountered during the implementation of this project, it is recommended that the project be halted and the project archaeologist be contacted. It is recommended that cultural resource clearance be given and no further work is recommended for this project.

J. Attachments

APE Map
APE Photographs

K. Repository:

Field records will be kept at the office of Stephanie Crockett, Cultural Resource Consulting, PO Box 126, Victor, Idaho 83455. Final copies are held at the State Historic Preservation Office, 210 Main Street, Boise, Idaho 83702.

L. Certification of Results:

I certify that this investigation was conducted and documented according to the Secretary of the Interior's Standards and guidelines and that the report is complete and accurate to the best of my knowledge.

Stephen Crockett
Signature of Reporter

3/27/14
Date

APE Overview Photographs
Comore Loma Water Improvements

APE Overview for the Tank 1 Removal and Replacement Location. Facing SW from NE Corner of APE. Tank 1 in View. Photo Log No. 1.

APE Overview for the Tank 1 Removal and Replacement Location. Facing NW from SE Corner of APE. Tank 1 in View atop Hill. Photo Log No. 2.

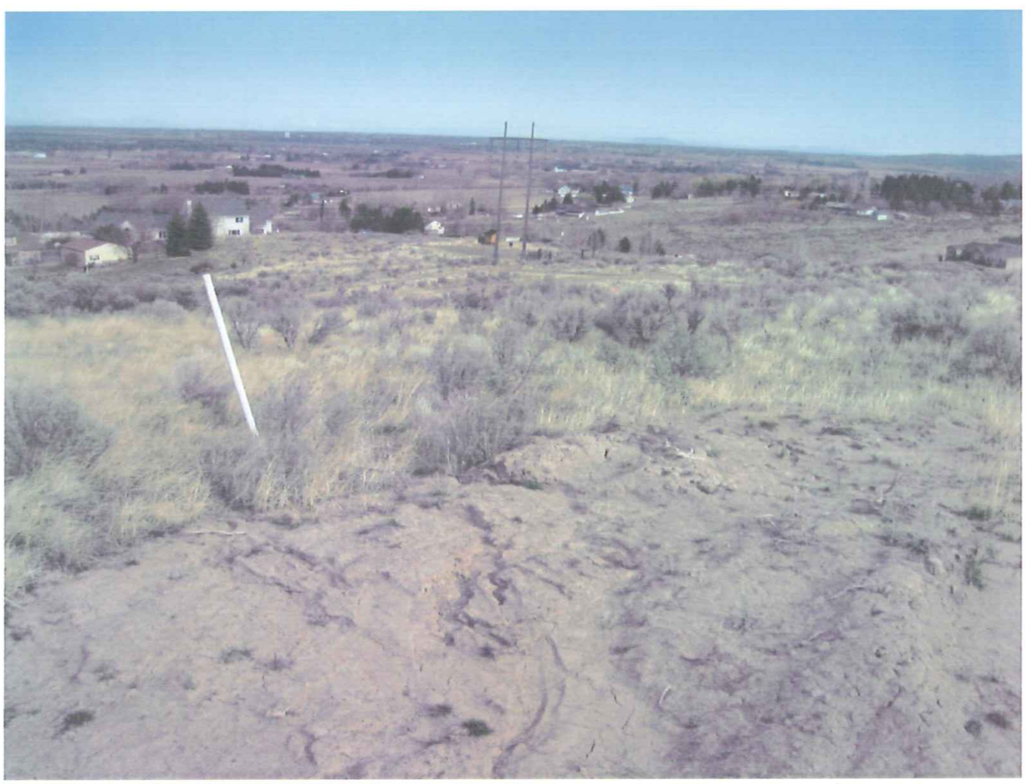
APE Overview Photographs
Comore Loma Water Improvements

APE Overview for the Tank 1 Removal and Replacement Location. Facing NE from SW Corner of APE. Tank 1 in View Atop Hill with Sheds & Cell Tower in View. Photo Log No. 3.

View of Tank 1 Water and Power Transmission Line, Along Staked Route, Facing West. Photo Log No. 4.

APE Overview Photographs
Comore Loma Water Improvements

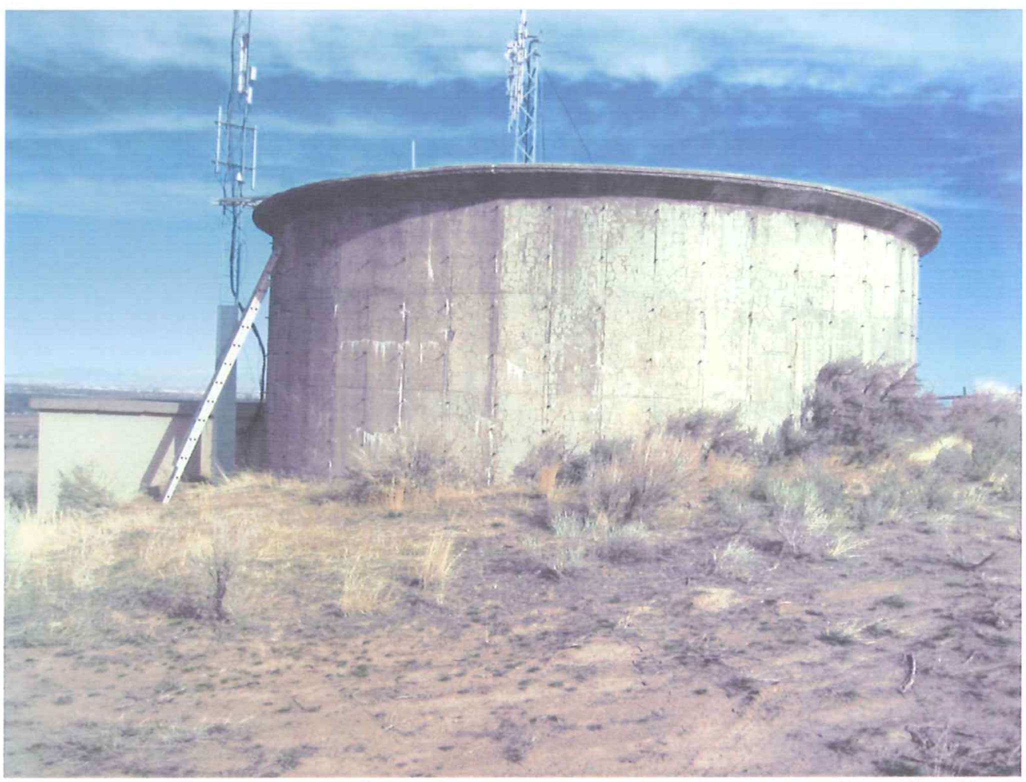
View Facing East of Staked Transmission Line as it Arcs Uphill towards Tank 1 in View atop Hill. Photo Log No. 5.



View of Staked Transmission Line for Tank 1 Facing North Towards Well 4. Well is the Small Brown Building just Beyond the Double Power Poles. Photo Log No. 6.

APE Overview Photographs
Comore Loma Water Improvements

View of Staked Transmission Line for Tank 1 From Well 4, Facing South. Photo Log No. 7.



Close-up View of 1970s era Tank 1 to be Removed. Facing Northwest. Photo Log No. 9.

APE Overview Photographs
Comore Loma Water Improvements

APE Overview for Proposed Tank 3 Location, Facing SE from NW Corner. Photo Log No. 10.

APE Overview for Proposed Tank 3 Location, Facing NE from SW Corner. Photo Log No. 11.

APE Overview Photographs
Comore Loma Water Improvements

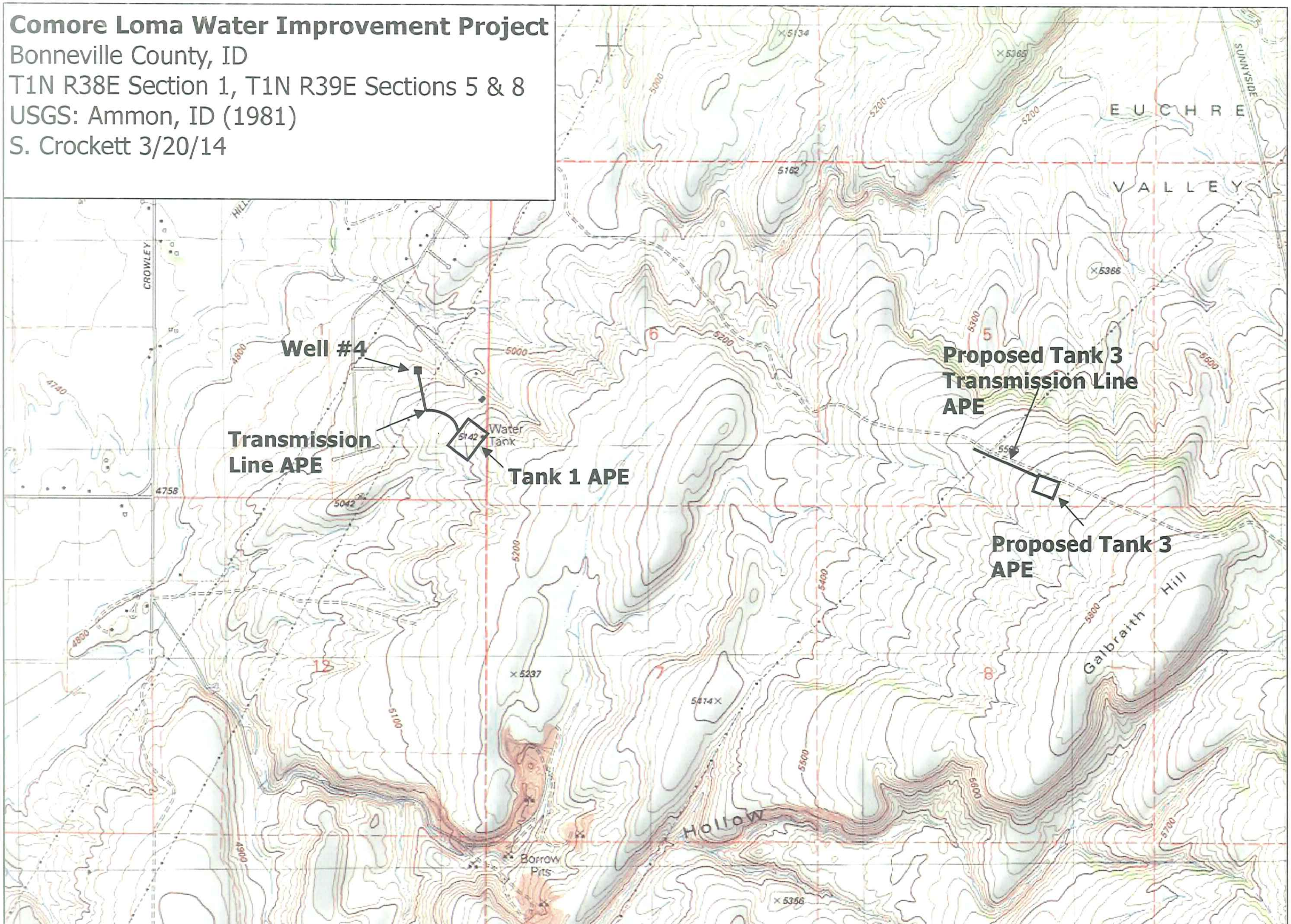
APE Overview for Proposed Tank 3 Location, Facing NW from SE Corner. Photo Log No. 12.

APE Overview for Proposed Tank 3 Location, Facing SW from NE Corner. Photo Log No. 13.

APE Overview Photographs
Comore Loma Water Improvements

APE Overview of Unstaked Transmission Route for Tank 3. View from Proposed Tank 3 Site towards Hydrant Left of Double Power Poles in the Distance, Facing West. Photo Log No. 14.

APE Overview of Unstaked Transmission Route to Proposed Tank Site 3 on Hill Top, Facing East. Photo Log No. 15.



Comore Loma Water Improvements Project, Bonneville County S. Crockett (3/20/14)

www.history.idaho.gov

Idaho • State Historical Society

C.L. "Butch" Otter
Governor of Idaho

Janet Gallimore
Executive Director

Administration
2205 Old Penitentiary Road
Boise, Idaho 83712-8250
Office: (208) 334-2682
Fax: (208) 334-2774

Membership and Fund Development
2205 Old Penitentiary Road
Boise, Idaho 83712-8250
Office: (208) 514-2310
Fax: (208) 334-2774

Historical Museum and Education Programs
610 North Julia Davis Drive
Boise, Idaho 83702-7695
Office: (208) 334-2120
Fax: (208) 334-4059

State Historic Preservation Office and Historic Sites Archeological Survey of Idaho
210 Main Street
Boise, Idaho 83702-7264
Office: (208) 334-3861
Fax: (208) 334-2775

Statewide Sites:
• Franklin Historic Site
• Pierce Courthouse
• Rock Creek Station and
• Stricker Homesite

Old Penitentiary
2445 Old Penitentiary Road
Boise, Idaho 83712-8254
Office: (208) 334-2844
Fax: (208) 334-3225

Idaho State Archives
2205 Old Penitentiary Road
Boise, Idaho 83712-8250
Office: (208) 334-2620
Fax: (208) 334-2626

North Idaho Office
112 West 4th Street, Suite #7
Moscow, Idaho 83843
Office: (208) 882-1540
Fax: (208) 882-1763

March 28, 2014

Paul H. Scoresby, PE
Schiess & Associates
7103 South 45th West
Idaho Falls, ID 83402

RE: Comore Loma Water Improvement Project (Idaho SHPO REV 2014-453)

Dear Mr. Scoresby,

We have received a cultural resources report completed by Stephanie Crockett with Cultural Resource Consulting. We have reviewed the report and concur with Ms. Crockett's recommendation that the undertaking will have no effect on historic properties (36 CFR 800.4).

We appreciate your consulting with our office. If you have any questions feel free to contact me at 208-334-3861 x107 or ethan.morton@ishs.idaho.gov.

Sincerely,

Ethan Morton
Archaeologist, Idaho State Historic Preservation Office

Gmail by Google

Annalyn Jensen <clerk@schiesseng.com>

Agency Response Letters for Comore Loma

Eastman, Susan <Eastman.Susan@epa.gov> Fri, Feb 21, 2014 at 6:14 PM
To: Annalyn Jensen <clerk@schiesseng.com>

For future reference all I require is the Sole Source Aquifer checklist submitted via email to me. I did receive the checklist and letter and supporting documentation/maps. Below is your approval.

Thank you for submitting your project for review. We have reviewed the information provided and find that the project will not have a significant adverse impact on the Eastern Snake River Plain Sole Source Aquifer and therefore the funding may proceed.

EPA reviews federally financially assisted projects that are proposed in federally designated Sole Source Aquifer review areas to determine if the projects have a potential to contaminate the aquifer through a recharge zone so as to create a significant hazard to public health. Such projects are submitted to EPA by federal, state, and local governments, and by the public.

This correspondence only addresses the Sole Source Aquifer Program, any other federal environmental requirements are your responsibility to ensure compliance. Please retain this email for your records.

From: Annalyn Jensen [mailto:clerk@schiesseng.com]
Sent: Tuesday, February 18, 2014 9:38 AM
To: James.M.Joyner@usace.army.mil; William Teuscher; rensay.pwen@deq.idaho.gov; Ethan.Morton@ishs.idaho.gov; Eastman, Susan; Werntz, James; keri.sigman@idwr.idaho.gov; keager@phd7.idaho.gov
Cc: Paul Scoresby
Subject: Agency Response Letters for Comore Loma

Good Morning,

[Quoted text hidden]

Gmail by Google

Annalyn Jensen <clerk@schiesseng.com>

Response: Comore Loma Water Improvement Project EID comments request

Annalyn Jensen <clerk@schiesseng.com> Tue, Feb 25, 2014 at 10:11 AM
To: "Grafe, Cyndi" <Grafe.Cyndi@epa.gov>

Cyndi,

I have attached the following information that we sent to Susan Eastman in regards to the Comore Loma Water System Improvement Projects. Attached is a map of the Eastern Snake River Sole Source Aquifer. It shows that Comore Loma is outside the aquifer but in the larger stream flow area of the aquifer. If you have any question or concerns please let us know and we look forward to further response.

Thank you,
[Quoted text hidden]

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--

Annalyn Jensen
Schiess & Associates
7103 South 45th West | Idaho Falls, Idaho 83402
Phone 208-522-1244 | Fax 208-522-9232

Sample letter sent to EPA.pdf
2827K

Gmail by Google

Annalyn Jensen <clerk@schiesseng.com>

Response: Comore Loma Water Improvement Project EID comments request

Grafe, Cyndi <Grafe.Cyndi@epa.gov> Tue, Feb 25, 2014 at 10:21 AM
To: Annalyn Jensen <clerk@schiesseng.com>

Hi Annalyn,

Thank you for your quick response. We just wanted to ensure coordination with Susan Eastman. We've found the GIS coverage to be a helpful tool particularly with the zoom feature easier viewing of boundary lines.

With regards,

Cyndi

Cyndi Grafe
U.S. EPA, Idaho Office
950 W. Bannock Street
Boise, ID 83702
phone: (208) 378-5771, fax: (208) 378-5744

Follow @EPAnorthwest on Twitter! https://twitter.com/EPAnorthwest

From: Annalyn Jensen [mailto:clerk@schiesseng.com]
Sent: Tuesday, February 25, 2014 10:11 AM
To: Grafe, Cyndi
Subject: Re: Response: Comore Loma Water Improvement Project EID comments request

[Quoted text hidden]

Grafe, Cyndi

From: Grafe, Cyndi
Sent: Tuesday, February 25, 2014 8:53 AM
To: clerk@schiesseng.com
Cc: Werntz, James
Subject: Response: Comore Loma Water Improvement Project EID comments request
Attachments: R10 Sole Source Aquifer Checklist.doc; EPA-s-Planning-for-Sustainability-Handbook.pdf

Good morning Paul,,

Thank you for requesting comments regarding the Comore Loma Water System Improvement Project. After checking with my colleagues, the R10 Idaho Operations Office has the following specific comment regarding this project:

The project is located within the Eastern Snake River Plain Sole Source Aquifer designation. See http://epa.maps.arcgis.com/apps/OnePane/basicviewer/index.html?appid=f3d18e11355c4f2ca0f1ef6228aa4de0 . Please refer to the attached Sole Source Aquifer Checklist. You can also contact our regional sole source aquifer lead, Susan Eastman, at 206-553-6249 or eastman.susan@epa.gov for more information.

We also offer the following more general comment and information for your consideration. As you may know, EPA has been encouraging sustainable water infrastructure solutions from design and construction through operation and maintenance. In particular, we encourage communities and engineering firms to review the *Planning for Sustainability: A Handbook for Water and Wastewater Utilities*.

This document provides helpful information for water and wastewater systems to use cost effective, environmentally sound, and sustainable approaches. The handbook includes alternative analysis during the facility planning process and an approach to consistently develop broader assessment criteria to incorporate a community's sustainability goals.

Perhaps you are already using these types of sustainable approaches. But, just in case, I have attached the handbook for your reference so that you may consider sustainable infrastructure opportunities for this planning effort as well as your other engineering projects. Additionally, more information and resources regarding sustainable infrastructure can be found at http://water.epa.gov/infrastructure/sustain/ .

Please feel free to contact me with any questions. With best regards,
Cyndi

Cyndi Grafe
U.S. EPA, Idaho Office
950 W. Bannock Street
Boise, ID 83702
phone: (208) 378-5771, fax: (208) 378-5744

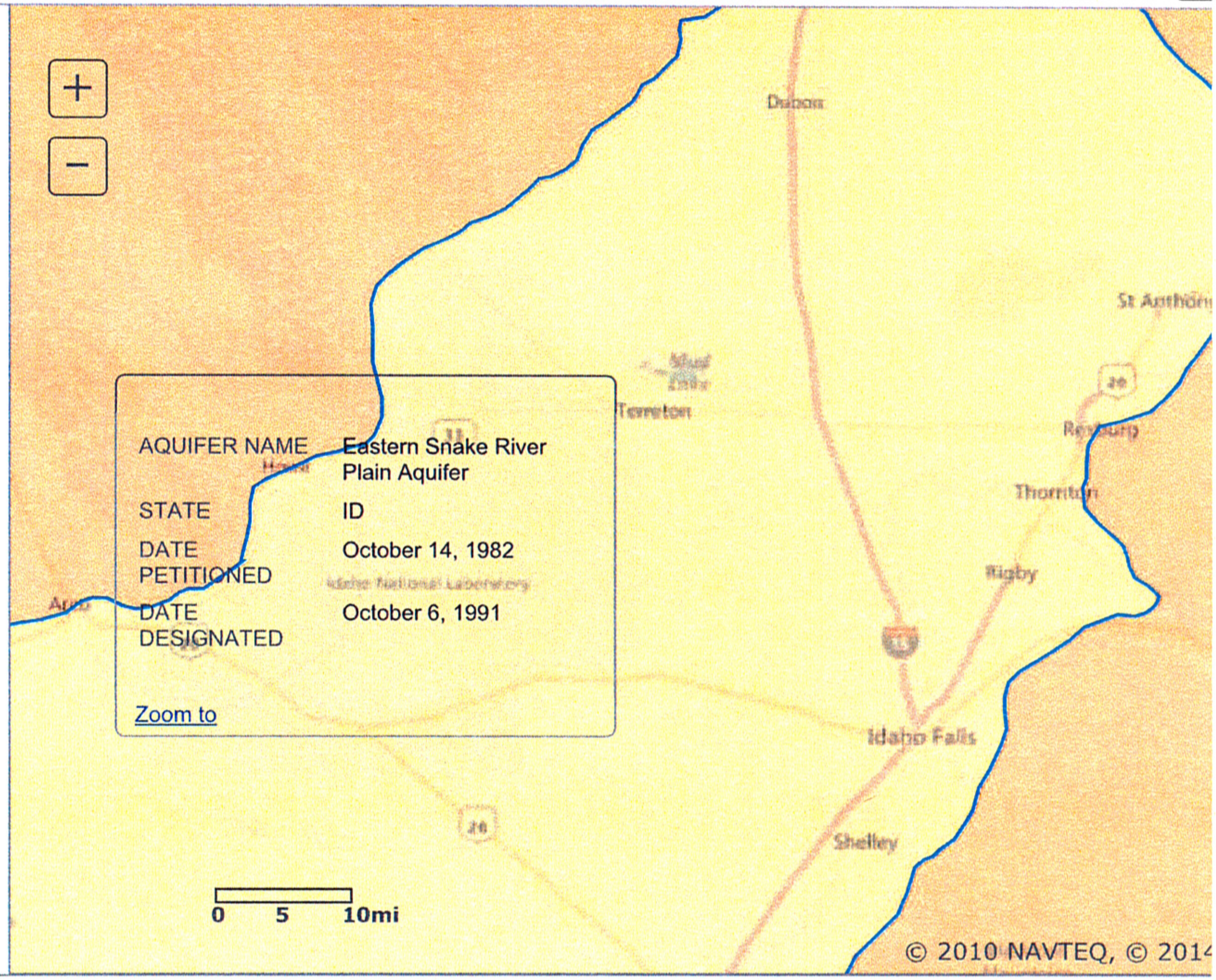
Follow @EPAnorthwest on Twitter! https://twitter.com/EPAnorthwest

Sole Source Aquifers in EPA Region 10

Legend | Printout | Layers | Basemap | Measure | Share

Sole Source Aquifers

- Aquifer Area
- Streamflow Area



Gmail by Google

Annalyn Jensen <clerk@schiesseng.com>

Comore Loma Water System Improvements Response Letter

2 messages

Annalyn Jensen <clerk@schiesseng.com> Tue, Mar 18, 2014 at 11:47 AM
To: keri.sigman@idwr.idaho.gov

Keri,

We were wondering if you were going to comment on our response letter dated February 14, 2014. We are being pushed to finish the environmental document due to the funding of the project. Please let us know if you are going to respond.

Thank you,

--
--
Annalyn Jensen
Schiess & Associates
7103 South 45th West | Idaho Falls, Idaho 83402
Phone 208-522-1244 | Fax 208-522-9232

Sigman, Keri <Keri.Sigman@idwr.idaho.gov> Tue, Mar 18, 2014 at 12:51 PM
To: Annalyn Jensen <clerk@schiesseng.com>

Good afternoon Annalyn. I'm looking at the request for comments letter now. I'm not able to locate the project area on any maps. Do you have parcel numbers? Also, have you placed the project area over any Special Flood Hazard Maps? If so, was any of the development located within the SFHA?

Keri K. Smith-Sigman, CFM
Idaho State Floodplain Coordinator

t. 208-287-4928

c. 208-830-4174

From: Annalyn Jensen [mailto:clerk@schiesseng.com]
Sent: Tuesday, March 18, 2014 11:47 AM
To: Sigman, Keri
Subject: Comore Loma Water System Improvements Response Letter

[Quoted text hidden]

Gmail by Google

Paul Scoresby <pscoresby@schiesseng.com>

Floodplain map for Comore Loma

1 message

Paul Scoresby <pscoresby@schiesseng.com> Thu, Mar 20, 2014 at 5:30 PM
To: keri.sigman@idwr.idaho.gov
Cc: Annalyn Jensen <clerk@schiesseng.com>

Keri,

Here is the map you requested. Only a very very small portion of the community is within the floodplain. No part of the water system except for one existing well (Well 2) is in the floodplain. All aspects of this project are outside of the floodplain. Please let me know if you need anything else or have any questions. I look forward to your response.

Sincerely,

--

Paul H. Scoresby, MS, PE

Schiess & Associates
7103 S. 45th W. I Idaho Falls, Idaho 83402
208-522-1244 I FAX 208-522-9232 I Cell 208-313-2454
pscoresby@schiesseng.com

FEMA Map - Figure 4.pdf
1233K

Gmail by Google

Paul Scoresby <pscoresby@schiesseng.com>

Floodplain map for Comore Loma

Sigman, Keri <Keri.Sigman@idwr.idaho.gov> Fri, Mar 21, 2014 at 3:27 PM
To: Paul Scoresby <pscoresby@schiesseng.com>

Good afternoon Mr. Scoresby. Thank you for attaching the map showing the location of all proposed improvements for the Comore Loma project in relation to any special flood hazard area (SFHA). After review of the information you presented, because none of the proposed development/improvements are located in the SFHA there are no concerns or requirements per the minimum standards of the National Flood Insurance Program. Please let me know if you need any additional information or have any further questions.

Thank you for the opportunity to provide comment.

Sincerely,

Keri K. Smith-Sigman, CFM
Idaho State Floodplain Coordinator

t. 208-287-4928

c. 208-830-4174

From: Paul Scoresby [mailto:pscoresby@schiesseng.com]
Sent: Thursday, March 20, 2014 5:31 PM
To: Sigman, Keri
Cc: Annalyn Jensen
Subject: Floodplain map for Comore Loma

[Quoted text hidden]

EASTERN IDAHO
Public Health
DISTRICT

ENVIRONMENTAL HEALTH DIVISION

1250 Hollipark Drive
Idaho Falls, Idaho 83401
208.523.5382
fax 208.528.0857
www.idaho.gov/phd7

Promoting the Health of People & Their Environment

March 4, 2014

Paul H. Scoresby
Schiess & Associates
7103 South 45th West
Idaho Falls, ID 83402

RE: ENVIRONMENTAL INFORMATION RESPONSE

Dear Mr. Scoresby:

This letter is in regards to your February 14, 2014 Environmental Information Document letter for Comore Loma Water Improvement Project in Bonneville County, Idaho. Our comments are declared below.

This Department has comments on two (2) of the project's bullet items we would like to declare. They are in no particular order of rank.

#1- Regarding Bullet Item #3, if the drilling location is determined, is it within 100 feet of any existing drainfields? This office was not contacted for any septic permit records.

#2- Regarding Bullet Item #5, does the already installed underground piping meet required set back distances from septic systems?

Thank you for the opportunity to respond. Please call if you have questions. The number is (208) 523-5382.

Sincerely,

Kellye Eager, REHS
Environmental Health Director

CC: Geri Rackow, EIPHD- District Director
R.J. Moss, EIPHD- Bonneville County
Nathan Taylor, EIPHD- EH Supervisor

Gmail by Google

Paul Scoresby <pscoresby@schiesseng.com>

Comore Loma Environmental Information Document

1 message

Paul Scoresby <pscoresby@schiesseng.com> Thu, Mar 13, 2014 at 5:03 PM
To: Kellye Eager <KEager@phd7.idaho.gov>

Kelly,

The email responds to your letter dated March 4, 2014 regarding the Eastern Idaho Public Health District's response to our review request of the locations of the proposed water system facilities for Comore Loma Water Corporation. This email responds to the items in your letter in the same order.

Item 1
We believe that the sewage disposal system for the home on Lot 25 of Block 18 of Division 23 is well outside of 100 feet of the north boundary of the Well 7 well lot. We arrived at this conclusion after studying the on-site sewage disposal permit and photos you sent us regarding the septic tank and drain field installation for this property and by comparing those photos to ground images available on Google Maps Street View. The water system storage tank on the hill is viewable in the background of some of the images you sent and the street view images, which places the sewage disposal system on the north side of the lot and north of and behind the shop to the west. This property has the only home on a lot adjacent to the well lot. It is apparent that the 100 foot separation rule of a well and an underground sewage disposal system has not been violated.

Item 2
All underground mainline piping that delivers potable water to each home in the Comore Loma neighborhood was installed in the road right of way or the 15 foot wide utility easements adjacent to the road right of way. These were installed before final plats were approved and prior to any home construction.

Please let us know if you have any further response.

Sincerely,
--

Paul H. Scoresby, MS, PE

Schiess & Associates
7103 S. 45th W. I Idaho Falls, Idaho 83402
208-522-1244 I FAX 208-522-9232 I Cell 208-313-2454
pscoresby@schiesseng.com

MEMO

TO:	PAUL SCORESBY
FROM:	ESTER CEJA – DEQ GRANT AND LOAN PROGRAM
SUBJECT:	COMORE LOMA CORPORATON – DRINKING WATER IMPROVEMENT PROJECT - THREATENED/ENDANGERED SPECIES AND ESSENTIAL FISH HABITAT
DATE:	MARCH 7, 2014

The Comore Loma Corporation drinking water improvement project includes the following:

- Replacement of tank 1 and construction of a new booster pump station adjacent to tank 1
- Construction of a new tank (tank 3)
- Connect tank 3 to the existing distribution line on the upper section of Middle Fork Drive
- Completion of well 7
- Completion of the Big Bend Drive boost pump station (underground piping already completed)
- Installation of 24 fire hydrants throughout the subdivision
- Installation of flow meters to the existing well pump stations
- SCADA improvements
- Replacement of broken system valves throughout the subdivision
- Acquisition of portable generator

The U.S. Fish and Wildlife (USFWS) threatened and endangered species list revised date of 10/23/2013 was used for determining endangered, threatened, and proposed species within Bonneville County. The USFWS was consulted and their 2/27/14 response is attached. The following species are listed within Bonneville County:

1. **Canada Lynx** (threatened) - Canadian Lynx reside in boreal forest landscapes and provide one or more of the following beneficial habitat elements including snowshoe hares for prey, abundant, large, woody debris piles that are used as dens, and winter snow conditions that are generally deep and fluffy for an extended period of time. The proposed project planning area does not include suitable habitat for the species. The proposed improvements at the existing wastewater facility will have "NO EFFECT" on Canadian Lynx.

2. **Greater Sage-Grouse** (candidate) - Grouse reside in Sagebrush Steppe environments. The proposed project improvements are not located in priority habitat for Sage Grouse. The improvements primarily consist of replacements with limited new construction. The proposed project will have "NO EFFECT" on sage grouse.

3. **Grizzly Bear** (threatened) - Grizzly bears are found in Alaska, in Canada and the northwestern United States including Idaho, Montana, Washington, and Wyoming.

In Idaho they can be found in the Selkirk Mountains range and the Yellowstone area in southeastern Idaho. The proposed project improvements will be occurring in developed non-forest, desert landscape. The proposed project will have "NO EFFECT" on grizzly bear.

4. **North American Wolverine** (candidate) - The North American Wolverine is a proposed species which does not exist in the proposed project planning area. The proposed project will have a "NO EFFECT" on the wolverine species. Wolverines distribution is restricted to high elevation, deep persistent, and reliable spring snow cover (April 15 to May 14) is the best overall predictor of wolverine occurrence in the contiguous U.S. (http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A0FA). The proposed improvement location is not located within wolverine habitat.

5. **Whitebark Pine** (candidate) – The Whitebark pine is a 5 needle conifer species. The species occurs from approximately 2,950 at its northern limit in British Columbia up to 12,000 in the Sierra Nevada. The Whitebark Pine is typically found at or slightly lower than alpine timberline in the upper montane zone. In the U.S. it is primarily found on public lands. The species is typically found in cold, windy, moist high elevation or high latitude sites in Western North America. The proposed improvements will have "NO EFFECT" on the candidate species there is no presence of the pine species within the area.

6. **Ute Ladies' Tresses** (threatened) - The species is found in moist to wet conditions, where competition for light, space, water, and other resources is normally kept low by periodic or recent disturbance events. The project improvements will take place in desert landscape with no canals, streams, wetlands or other bodies of water within close proximity. The proposed project will have "NO EFFECT" on the Ute Ladies' Tresses.

7. **Yellow-Billed Cuckoo** (proposed) - Western cuckoos breed in large blocks of riparian habitats, particularly woodlands with cottonwoods and willows. Generally local and uncommon in scattered drainages of the arid and semiarid portions of western Colorado, western Wyoming, Idaho, Nevada and Utah. In southwestern Idaho, the yellow-billed cuckoo has been considered a rare, sometimes erratic, visitor and breeder in the Snake River Valley. The project is located in desert landscape and absent of riparian areas. The proposed project will have "NO EFFECT" to the Cuckoo.

Essential Fish Habitat

The Comore Loma Corporation drinking water system improvement project is not located within Essential Fish Habitat (EFH) for Salmon as identified in the attached EFH map and will have "NO EFFECT."

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Eastern Idaho Field Office
4425 Burley Dr., Suite A
Chubbuck, Idaho 83202
Telephone (208) 237-6975
http://IdahoES.fws.gov

Ester Ceja
Idaho Department of
Environmental Quality
1410 North Hilton
Boise, Idaho 83706

Subject: Proposed Comore Loma Corporation Drinking Water Improvement Project in Bonneville County, Idaho.
Species Request 2014-TA-0207

Dear Ms. Ceja:

The U.S. Fish and Wildlife Service (Service) is writing in response to your request for information about the potential impacts to endangered, threatened, proposed, and/or candidate species from the proposed Comore Loma Water Corporation Water Improvement Project in Bonneville County, Idaho. The Service has not identified any issues that indicate that consultation under section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.; (Act)), is needed for this project. This finding is based on our understanding of the nature of the project, local conditions, and/or current information indicating that no listed species are present. If you determine otherwise or require further assistance, please contact Nisa Marks (Nisa_Marks@fws.gov) of this office at (208)237-6975 ext. 121.

Thank you for your interest in endangered species conservation.

Sincerely,

David Kampwerth
Field Supervisor

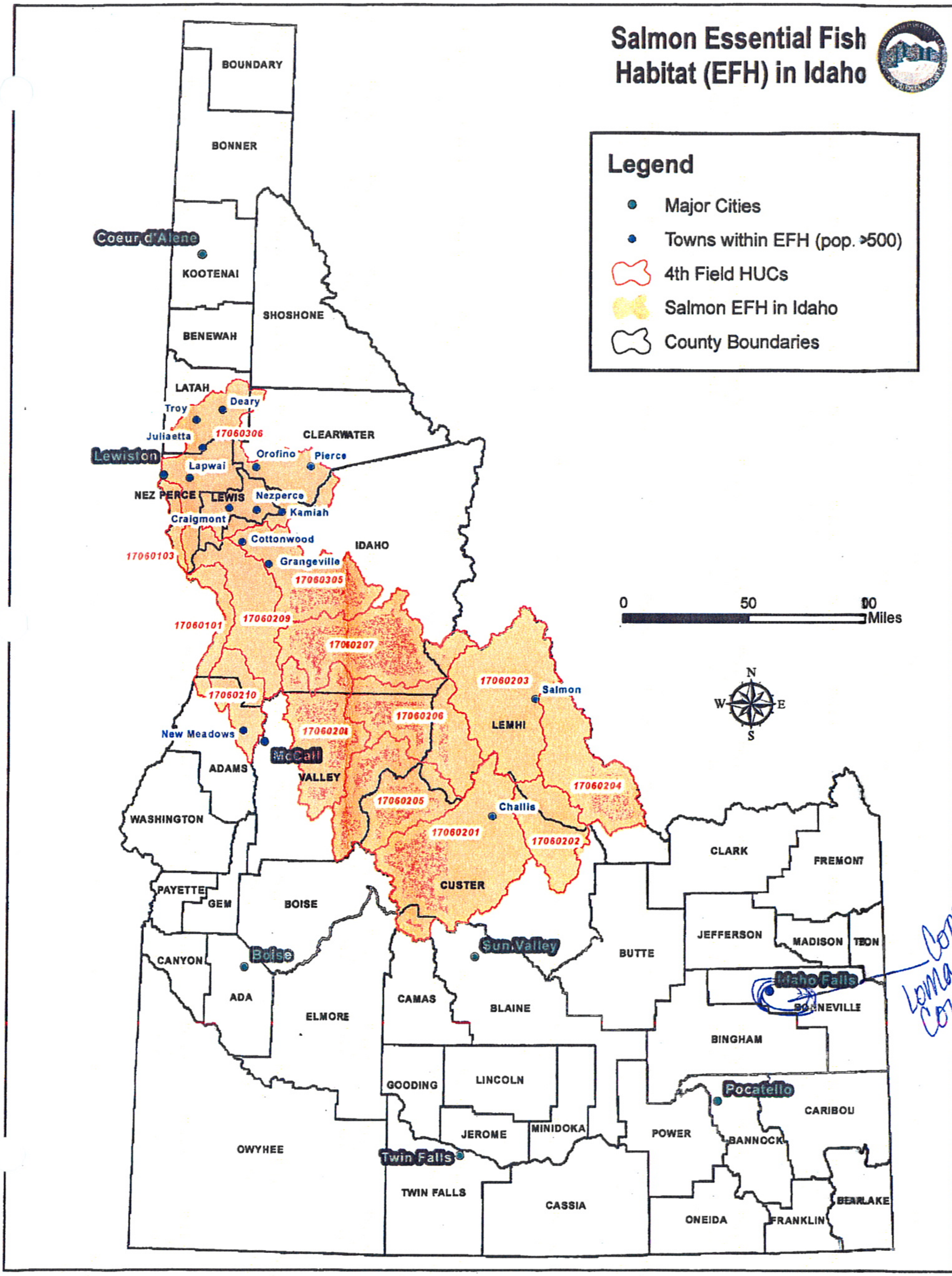
This information is for general reference only. Visit http://ecos.fws.gov/ipac/ to obtain an official list for purposes of Endangered Species Act Section 7 Consultation. Revised 10/23/2013.

U.S. Fish and Wildlife Service • Idaho Fish and Wildlife Office

LISTED, CANDIDATE, AND PROPOSED SPECIES & DESIGNATED AND PROPOSED CRITICAL HABITAT IN IDAHO

	Herps	Birds		Mammals						Fish		Mollusks				Plants							
Common Name	Columbia Spotted Frog (Great Basin Population)	Greater Sage-Grouse	Yellow-Billed Cuckoo	Canada Lynx	Grizzly Bear	Northern Idaho Ground Squirrel	Selkirk Mountains Woodland Caribou	Southern Idaho Ground Squirrel	North American Wolverine	Bull Trout	Kootenai River White Sturgeon	Banbury Springs Lanx	Bliss Rapids Snail	Bruneau Hot Springsnail	Snake River Physa	Goose Creek Milkvetch	MacFarlane's Four-O'Clock	Packard's Milkvetch	Slickspot Peppergrass	Spalding's Catchfly	Ute Ladies'-Tresses	Water Howellia	Whitebark Pine
Scientific Name	*Rana luteiventris*	*Centrocercus urophasianus*	*Coccyzus americanus*	*Lynx canadensis*	*Ursus arctos horribilis*	*Spermophilus brunneus brunneus*	*Rangifer tarandus caribou*	*Spermophilus brunneus endemicus*	*Gulo gulo luscus*	*Salvelinus confluentus*	*Acipenser transmontanus*	*Lanx* sp.	*Taylorconcha serpenticola*	*Pyrgulopsis bruneauensis*	*Haitia (Physa) natricina*	*Astragalus anserinus*	*Mirabilis macfarlanei*	*Astragalus cusickii* var. *packardiae*	*Lepidium papilliferum*	*Silene spaldingii*	*Spiranthes diluvialis*	*Howellia aquatilis*	*Pinus albicaulis*
Ada		C	P							T					E				P-PCH				
Adams		C		T		T		C	P	T-DCH													C
Bannock		C	P						P														
Bear Lake		C		T					P														
Benewah				T					P	T-DCH										T		T	
Bingham		C	P						P												T		
Blaine		C	P	T					P	T-DCH													C
Boise			P	T					P	T-DCH													C
Bonner				T	T		E		P	T-DCH													C
Bonneville		C	P	T	T				P												T		C
Boundary				T-DCH	T		E-DCH		P	T-DCH	E-DCH												C
Butte		C		T					P	T-DCH													C
Camas		C	P	T					P	T-DCH													C
Canyon															E				P-PCH				
Caribou		C		T					P														
Cassia		C	P												E	C							
Clark		C	P	T	T				P														C
Clearwater				T					P	T-DCH													C
Custer		C	P	T					P	T-DCH													C
Elmore		C	P	T					P	T-DCH			T		E				P-PCH				C
Franklin		C		T					P														
Fremont		C	P	T	T				P												T		C
Gem		C						C	P	T-DCH									P-PCH				C

Table Key: C = Candidate Species P= Proposed Species T=Threatened Species E=Endangered Species PCH= Proposed Critical Habitat DCH=Designated Critical Habitat



Conmore Loma Corp.

Paul Scoresby <pscoresby@schiesseng.com>

Comore Loma --

1 message

Ester.Ceja@deq.idaho.gov <Ester.Ceja@deq.idaho.gov> Mon, Mar 24, 2014 at 8:34 AM
To: pscoresby@schiesseng.com, clerk@schiesseng.com
Cc: Ester.Ceja@deq.idaho.gov

Anna and Paul,

I received a letter after the 30 day comment period from the Shoshone Bannock Tribes of which I am attaching. The Tribe would like additional information on the area of potential effect. Specifically they want to know if there has been a current archeological survey completed for this area? Has there at any time been an archeological survey completed for the area? Can you provide the legal description of the APE as well as the land ownership within the APE.

If you could please provide me with that information so I can share it with the Shoshone Bannock Cultural Resources Program.

Please include a copy of the attached letter and incorporate the inadvertent discovery language that has been provided in the Tribal response letter.

Let me know if you have any questions.

Thanks,

Ester Ceja

Sr. Water Quality Analyst

1410 North Hilton

Boise, Idaho 83706

Phone (208) 373.0585

Fax (208) 373.0576

Ester.Ceja@deq.idaho.gov

The SHOSHONE-BANNOCK TRIBES

PHONE: (208) 236-1086
FAX: (208) 478-3707
EMAIL: csmith@sbtribes.com
lbill@sbtribes.com
romartinez@sbtribes.com

CULTURAL RESOURCES
HERITAGE TRIBAL OFFICE (HETO)
P.O. BOX 306
FORT HALL, IDAHO 83203

March 21, 2014

Ester Ceja
Sr. Water Quality Analyst
STATE OF IDAHO/DEQ
1410 North Hilton
Boise, ID 83706

RE: Proposed Comore Loma Water Corporation Drinking Water Improvement Project

Dear Ms. Ceja:

The Shoshone-Bannock Tribes (Tribes) Heritage Tribal Office (HeTO) appreciates the opportunity to comment on the proposed Comore Loma Water Corporation Drinking Water Improvement Project.

The proposed project located southeast of the City Of Ammon, Bonneville County, Idaho is within inherent ancestral lands of the Shoshone and Bannock people, and continues to hold important cultural properties, traditional hunting, fishing and gathering activities still practiced today by members of the Shoshone-Bannock Tribes.

According to the information provided, the proposed project will consist of the construction of the following: Replacement of tank 1 and construction of a new booster pump station adjacent to tank 1, construction of a new tank (tank 3), connect tank 3 to the existing distribution line on the upper section of Middle Fork Drive, completion of well 7, completion of the Big Bend Drive booster pump station, installation of 24 fire hydrants throughout the subdivision, installation of flow meters to the existing well pump stations, SCADA improvements, replacements of broken system valves throughout the subdivision, and the acquisition of a portable generator. The construction of the proposed project will consist of ground disturbing activities; therefore, the Tribes HeTO requests the following inadvertent clause incorporated into the Stop Work Order Plan.

In the event of an inadvertent discovery (cultural resources and/or human remains) the Tribes HeTO requests a Stop Work Order of construction activities and immediate notification to the Tribes HeTO. Construction shall cease until proper treatment of cultural resources and/or human remains is achieved. The Tribes HeTO requests additional information concerning the APE, which would consist of: a current archaeological survey, a legal description and land ownership within the APE.

The purpose of this letter is to provide technical input and not intended as formal government-to-government consultation. Should there be any questions or concerns please feel free to contact me at phone: (208) 236-1084/ e-mail: romartinez@sbtribes.com; or Carolyn Smith (Cultural Resource Coordinator) at: (208) 236-1086/ email: csmith@sbtribes.com

Sincerely,

Romelia Martinez

Romelia Martinez
Cultural Resource Technician II
Shoshone-Bannock Tribes

CC: FILE- Proposed Comore Loma Water Corporation Drinking Water Improvement Project/DEQ-ID

Gmail by Google

Paul Scoresby <pscoresby@schiesseng.com>

Comore Loma --

Paul Scoresby <pscoresby@schiesseng.com> Thu, Mar 27, 2014 at 4:18 PM
To: Ester.Ceja@deq.idaho.gov

Ester,

I have attached the historical report prepared by Cultural Resource Consulting for the Comore Loma project. The owners of the properties in the APE explored in this report are listed below:

Tank 1 Site is now owned by Comore Loma Water Corporation, the non-profit corporation that owns, operates and maintains the water system for the community. They have no physical address. Their postal address is PO Box 1863, Idaho Falls, Idaho 83403. Their website is www.clwcorp.net.

Property in waterline and buried power line easement from Well 4 site to Tank 1 property is owned by BDS, LLC. Ownership of this company is held by Richard Skidmore and BonAdell Skidmore of 5490 E Skidmore Dr., Idaho Falls, Idaho 83406.

Proposed Tank 3 Site is now owned by Comore Loma Water Corporation.

Property in the waterline and access easement from Division 25 of the community to the proposed Tank 3 site is owned by Stonewood Investments, LLC. Ownership of this company is held by Richard Skidmore (address given above), David Skidmore of 7235 Cliffside, Idaho Falls, Idaho 83406, Randy Skidmore of 5220 E Comish Dr, Idaho Falls, Idaho 83406 and Brett Skidmore of 5358 E Skidmore Dr, Idaho Falls, Idaho 83406.

Legal descriptions of these areas are attached.

Please pass this information on to the Shoshone-Bannock Tribes.

Sincerely,
[Quoted text hidden]
--

Paul H. Scoresby, MS, PE

Schiess & Associates
7103 S. 45th W. I Idaho Falls, Idaho 83402
208-522-1244 I FAX 208-522-9232 I Cell 208-313-2454
pscoresby@schiesseng.com

5 attachments

14040_Comore Schiess ROS for Tank 3.pdf
245K

CLWC Tank 1 site legal description .pdf
833K

waterline legal description for easement.pdf
83K

14040_TANK 1.pdf

Gmail by Google

Paul Scoresby <pscoresby@schiesseng.com>

Comore Loma DW Tribal Consultation

1 message

Ester.Ceja@deq.idaho.gov <Ester.Ceja@deq.idaho.gov> Thu, Mar 20, 2014 at 7:57 AM
To: pscoresby@schiesseng.com, clerk@schiesseng.com

Annalyn and Paul,

Good morning. March 19, 2014 was the end of the 30 day comment period for tribal consultation. No comments were received from the Tribes. Please include the attached letters and this email in the EID to note consultation was requested but no comments provided by the Tribes. Make sure to include this discussion in the cultural resources section of the EID.

Let me know if you have any questions.

Thank you,
Ester Ceja

2 attachments

Comore Loma Water Corporation_DW Improvement Project_Shoshone Paiute Tribal Consultation Letter_2.18.14.PDF
123K

Comore Loma Water Corporation_DW Improvement Project_Shoshone Bannock Tribal Consultation Letter_2.18.14.PDF
125K

11.0 MAILING LIST

Attached herein is a list of mailing addresses used to send letters to the environmental review agencies and those that attended the public meeting.

Project Information Mailing List
Project Name: Comore Loma Drinking Water Facility Planning Study
Project #: 12076

Name	Representing	Environmental Resource Associated with Contact Agency	Address	City	State	Zip	Phone
James Joyner	US Army Corps of Engineers	Wetlands, 404 Permits, Flood Plains	900 N. Skyline Dr., Suite A	Idaho Falls	ID	83402	208-522-1676
Willie Teuscher	Idaho Falls Department of Environmental Quality	Water Quality	900 N. Skyline Dr., Suite B	Idaho Falls	ID	83402	208-528-2650
Rensay Owen	Idaho Falls Department of Environmental Quality	Air Quality	900 N. Skyline Dr., Suite B	Idaho Falls	ID	83402	208-528-2650
Ethan Morton	Idaho State Historical Society	Historic and archaeological sites and sensitive areas	210 Main Street	Boise	ID	83702	208-334-3847
Susan Eastman	Environmental Assessment	For any project located over a Sole Source Aquifer of Streamflow Source Area	1200 6th Avenue, OWW 136	Seattle	WA	98101	206-553-6249
James Wentz	U.S. EPA, Idaho Operations Office	Water Quality, Air Quality	950 W. Bannock Street, Ste. 900	Boise	ID	83702	208-378-5746
Keri Sigman	Idaho Department of Water Resouces	Floodplain management, maps, general program assistance	322 East Front Street PO Box 83720	Boise	ID	83720	208-287-4928
Kellye Eager	District 7 Health Department	Solid Waste	254 "E" Street	Idaho Falls	ID	83402	208-523-5382
Brian Kelly	US Fish and Wildlife Service		1387 South Vinnell Way, Room 368	Boise	ID	83709	208-378-5256
Ted Howard	Shoshone-Paiute Tribe		PO Box 21	Owyhee	NV	89832	208-759-3199
Carolyn Boyer Smith	Shoshone-Bannock Tribes		PO Box 306 Pima Dr.	Fort Hall	ID	83203	208-478-3707
Brenda Anderson	Self		5566 S Tappan Falls Drive	Idaho Falls	ID	83406	208-479-8821
Jim Southwick	Self		5117 Dagger Falls	Idaho Falls	ID	83406	208-522-2772
Dwight Hansen	Self		5212 S Marbrisa	Idaho Falls	ID	83406	208-521-6689
Randy & Vicki Runnings	Self		5405 Hacienda Dr	Idaho Falls	ID	83406	208-524-1619

Alvin & Carolee Hall	Self		5585 Tappan Falls Drive	Idaho Falls	ID	83406	208-390-5971
Steven & Deborah Giles	Self		6890 Red Bluff LN	Idaho Falls	ID	83406	208-881-5852
John & Anne Weathersby	Self		5633 E. Sagewood	Idaho Falls	ID	83406	208-523-6273
DeeAnn & Steve Lucks	Self		5086 E 65th S	Idaho Falls	ID	83406	208-523-6273
Ray Berry	Self		6836 S. Comore Dr.	Idaho Falls	ID	83406	208-523-0638
Vern & Monica Peterson	Self		5105 E. Sagewood Dr.	Idaho Falls	ID	83406	208-529-5502
John Vesely	Self		5615 Canyonwood Circle	Idaho Falls	ID	83406	208-552-2900
Todd Cornelison	Self		6085 E Sagewood Dr	Idaho Falls	ID	83406	208-351-6108
Derick Attebury	Self		940 Yellowpine	Idaho Falls	ID	83401	208-521-4500
George Vivian	Self		5755 Marbrisa	Idaho Falls	ID	83406	208-524-1016
Jim Cole	Self		5725 Solitude	Idaho Falls	ID	83406	208-535-1242
Linda Buttles	space left blank		5395 E. Neveso	Idaho Falls	ID	83406	208-520-5430
Debbie Borek	space left blank		5827 High Creek	Idaho Falls	ID	83406	619-985-4216
Glen & Sheila Walter	space left blank		5589 Canyonwood Circle	Idaho Falls	ID	83406	817-929-9887
Randy Skidmore	space left blank		5220 S Comish Dr	Idaho Falls	ID	83406	208-681-2199
Bruno Jachmann	CLWC Board Member		5675 S marbrisa Ln	Iaho Falls	ID	83406	208-523-8357
Jihad Aljayoushi	space left blank		6143 E Middle Fork	Idaho Falls	ID	83406	208-529-4020
Tina Bataska	space left blank		5405 High Willow	Idaho Falls	ID	83406	303-596-7793
Bill Windels	space left blank		5152 E Powerhouse Drive	Idaho Falls	ID	83406	208-542-5056
Bob Wilkins	space left blank		5757 Red Bluff	Idaho Falls	ID	83406	208-529-1655
Keith Arterburn	space left blank		5723 E 65 S	Idaho Falls	ID	83406	208-351-2999
Bob & Linda Davis	space left blank		5590 S Marbrisa	Idaho Falls	ID	83406	208-529-2611
Brian Cunningham	space left blank		5250 House Rock Circle	Idaho Falls	ID	83406	208-523-5422

Schiess & Associates
IMPROVING COMMUNITY INFRASTRUCTURE

Sherry Long	space left blank		5730 S Marbrisa Ln	Idaho Falls	ID	83406	208-522-9522
Todd Williams	space left blank		5818 Big Horn Circle	Idaho Falls	ID	83406	208-403-0699
Clinton Sheppard	space left blank		6015 Marbrisa Ln	Idaho Falls	ID	83406	208-538-0711
Elizabeth Bargon	space left blank		6015 Marbrisa Ln	Idaho Falls	ID	83406	208-538-0711
Rick Kearsley	space left blank		5337 E Powerhouse	Idaho Falls	ID	83406	208-419-3798
Greg English	space left blank		4940 E Loma Circle	Idaho Falls	ID	83406	208-523-1683
Wayne Simpson	space left blank		7015 Culebra Rio	Idaho Falls	ID	83406	208-521-4359
Brad Milliror	space left blank		6687 Red Bluff	Idaho Falls	ID	83406	240-620-9529
Kenneth Stowe	space left blank		5895 E Sagewood	Idaho Falls	ID	83406	208-524-9024
John Howard	space left blank		5204 Tappan Falls	Idaho Falls	ID	83406	208-523-0377
Rick Miller	ECIPDA		299 E 4th N	Rexburg	ID	83440	208-356-4524
Andrew Gibbons	space left blank		4970 E 65th S	Idaho Falls	ID	83406	208-552-7263
Tony Burton	space left blank		5705 Canyonwood Circle	Idaho Falls	ID	83406	208-201-5703
Dave Skidmore	space left blank		7235 Cliffside Ln	Idaho Falls	ID	83406	208-681-1299
Oliver Roberts	space left blank		5680 Sagewood	Idaho Falls	ID	83406	208-339-3602
Darvin Boyles	space left blank		7474 Cliffside Ln	Idaho Falls	ID	83406	208-716-3301
Craig & Cindie Winder	space left blank		7186 S Bowman	Idaho Falls	ID	83406	208-521-7290
John Zietz	space left blank		5354 E Powerhouse Dr	Idaho Falls	ID	83406	208-201-1457
Brad & Stephanie Streeper	space left blank		9815 N Yellowstone Hwy	Idaho Falls	ID	83401	208-521-6100
Rich & Stephanie Mayers	space left blank		5060 Comish	Idaho Falls	ID	83406	208-360-6326
David & Sheryl Smith	space left blank		5000 Comish	Idaho Falls	ID	83406	208-529-9313
Tom Hackney	space left blank		5851 E Sagewood	Idaho Falls	ID	83406	208-932-0361
Jake & Michelle Black	space left blank		6070 E Sagewood Dr	Idaho Falls	ID	83406	208-522-4178
Paul & Lindy Gerlach	space left blank		6584 Red Bluff Ln	Idaho Falls	ID	83406	208-522-1780
Burdett Hoskins	CLWC Board Secretary		6835 Red Bluff Ln	Idaho Falls	ID	83406	208-523-4883

Schiess & Associates
IMPROVING COMMUNITY INFRASTRUCTURE

Chris Monti	space left blank		6644 Insmada Circle	Idaho Falls	ID	83406	208-716-8154
Gordan & Colleen Durrant	space left blank		4990 E Sagewood	Idaho Falls	ID	83406	208-542-6551
Les Monse	space left blank		7040 S Sagewood Cir	Idaho Falls	ID	83406	208-709-7573
Jed Zirker	space left blank		5646 E Sagewood Dr	Idaho Falls	ID	83406	208-522-6549
Chad Landon	space left blank		5655 Sagewood Dr	Idaho Falls	ID	83406	208-520-3001
Josh Scott	space left blank		5465 Rio Seco Dr	Idaho Falls	ID	83406	208-390-8235
Angie English	space left blank		4940 E Loma Cir	Idaho Falls	ID	83406	208-523-1683
Casey Peterson	space left blank		6964 S Marble Cir	Idaho Falls	ID	83406	208-709-9898
Travis Waters	space left blank		5255 Houserock	Idaho Falls	ID	83406	208-313-5544
Ron Rope	space left blank		5800 Marbrisa	Idaho Falls	ID	83406	208-522-5367
Mark & Pam Fetzer	space left blank		7293 S Bowmans LN	Idaho Falls	ID	83406	208-523-9500
Carolyn Dustin	space left blank		5120 E Comish	Idaho Falls	ID	83406	208-523-9921
Russel Lewis	space left blank		7653 Cliffside Ln	Idaho Falls	ID	83406	208-206-2588
Rick Evans	CLWC Board Member		6670 Sagewood Cir	Idaho Falls	ID	83406	208-357-4196
Mark Bindenagel	space left blank		5385 E Skidmore Dr	Idaho Falls	ID	83406	208-529-1089
Jeff & Pam Shearer	space left blank		6808 Big Bend Dr	Idaho Falls	ID	83406	208-589-8800
Richard Hill	space left blank		5273 E Skidmore Dr	Idaho Falls	ID	83406	208-528-6169
Bill Dalton	space left blank		5379 E 65th S	Idaho Falls	ID	83406	208-351-9249
Fred Schneyder	space left blank		4810 Comish	Idaho Falls	ID	83406	208-524-1390
Tom Fallon	space left blank		7036 Marble Cir	Idaho Falls	ID	83406	208-557-0239

Others observed present, but not on official list:	John Buttles, CLWC Board President	wife was present
	Jake Dustin, CLWC Board Member	wife was present
	Paul Scoresby, Schiess & Associates, CLWC Engineer	

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706 • (208) 373-0502

C.L. "Butch" Otter, Governor
Curt Fransen, Director

May 30, 2014

President John Buttles
Comore Loma Water Corporation
P.O. Box 1863
Idaho Falls, Idaho 83404

RE: Draft finding of no significant impact for the Comore Loma Water Corporation Drinking Water Improvements

Dear Mr. Buttles:

The Idaho Department of Environmental Quality (DEQ) has completed a review of the environmental information document for the Comore Water Corporation Drinking Water Improvements. The potential impacts on a number of environmentally sensitive resources were evaluated in the environmental review. Comore Loma's project engineer consulted with a number of appropriate state and federal agencies regarding relevant issues. The project meets state and federal criteria for issuance of a finding of no significant impact (FONSI) since the environmental review process indicated no significant environmental impacts would result from the proposed project.

A FONSI legal notice will be published in the Idaho Falls *Post-Register,* newspaper of general circulation for the Comore Loma service area. DEQ has requested the *Post-Register* publish the legal notice one time, on one day, on June 6, 2014. The legal notice will explain how the public can obtain a copy of the full FONSI for review and will give instructions on how they can submit comments. A 30-day public comment period will follow the FONSI legal notice publication. If public comments and concerns arise related to the project or FONSI, DEQ may ask your help in preparing responses.

Following the 30-day public comment period, any significant comments or concerns will be considered and incorporated as appropriate into the final FONSI determination for the referenced project. After issuance of the final FONSI, and with approval of all technical considerations in the planning document, DEQ will proceed with the State Revolving Fund loan.

William Teuscher, P.E., at the DEQ Idaho Falls Regional Office, (208) 528-2666, is your local DEQ contact on the referenced project. Please keep him informed of progress on the project. Refer comments regarding the environmental review to Mike May in the State Office at Michael.May@deq.idaho.gov or (208) 373-0406.

Sincerely,

Barry N. Burnell

Barry N. Burnell
Water Quality Division Administrator

BNB:MLM:ls

Enclosures

c: Tim Wendland, DEQ State Office (TRIM)
William Teuscher, P.E., DEQ Idaho Falls (TRIM)
Paul H. Scoresby, P.E., Schiess & Associates (pscoresby@schiesseng.com)

DRAFT FINDING OF NO SIGNIFICANT IMPACT

Date: May 30, 2014

To: All Interested Government Agencies, Public Groups, and Individuals

Subject: Environmental determination for the Comore Loma Water Corporation Drinking Water Improvements

In accordance with the State Environmental Review Process (SERP) and the "Rules for Administration of Drinking Water Loan Program" (IDAPA 58.01.20), an environmental review has been performed and a draft finding of no significant impact (FONSI) is hereby issued by the Idaho Department of Environmental Quality (DEQ).

Project:	Comore Loma Water Corporation Drinking Water Improvements
Location:	Bonneville County, Idaho
DEQ Loan Number:	TBD
Total Loan Project Cost:	$3,050,000

PURPOSE/SUMMARY OF IMPACTS:

Purpose of Project: The purpose of the proposed project is to protect public health and safety by addressing deficiencies in capacity, redundancy and fire flows.

Description of the Project: The proposed project involves

- Replacement of an existing water storage tank with a new 422,000-gallon Tank 1;
- Installation of a booster pump station at Tank 1;
- Installation of new 533,000-gallon Tank 3
- Installation of transmission pipe along Middle Fork Drive to Tank 3;
- Addition of flow meters to existing pump stations;
- Installation of pumps and electrical in existing structure on Big Bend Street;
- Completion of Well 7, well house and ancillary equipment at the site of an existing test well;
- Installation of SCADA improvements for improved alarm and control;
- Purchase of a portable emergency generator and installation of switchgear; and
- Replacement of broken valves and installation of 24 fire hydrants along existing water mains.

Direct and Indirect Impacts: An environmental information document (EID) was prepared by Schiess & Associates (Schiess), consulting engineer for the Comore Loma Water Corporation (Comore Loma). Schiess and DEQ consulted with the appropriate state and federal agencies regarding relevant environmentally sensitive resources. Based on consultation with agency experts, Schiess and DEQ evaluated the potential short-term and long-term impacts, and the direct, indirect, and cumulative impacts of the drinking water improvement project. The evaluation emphasized site-specific components of the environment that are most likely to be impacted by the construction and operation of the proposed improvements. The results of the project evaluation indicate there will be environmental effects from the referenced project as described below.

Short-term impacts may occur during project construction that includes temporary disruption of the distribution system, increased noise, increased dust pollution, increased potential for stormwater runoff, and disruption of localized traffic conditions. The project contractor is responsible for managing the temporary disruptions of the system as follows:

- Air Quality: Temporary dust pollution impacts will be controlled as a condition of the construction specifications in accordance with the "Rules for the Control of Air Pollution in Idaho" (IDAPA 58.01.01.651). IDAPA 58.01.01.651 states that reasonable precautions shall be taken for dust control and suppression by using water or chemicals, applying dust suppressants, covering trucks, paving, and removing materials. In addition to the rule requirements, DEQ recommends that a dust prevention and control plan be implemented during construction of the project that includes best management practices (BMPs) to minimize dust pollution for fugitive dust control. Emergency generators must comply with Reciprocating Internal Combustion Engines National Emission Standards for Hazardous Air Pollutants.

- Cultural Resources: If archeological artifacts (such as beads, arrowheads, pottery, fabric, grave goods, glass, metal fragments, or other human-made objects that appear to predate 1960) or human remains (such as bones, bone fragments, or teeth) are inadvertently discovered during construction, ground disturbing activities shall cease and the State Historical Preservation Officer (SHPO), Shoshone-Bannock Tribe and Shoshone-Paiute Tribe shall be notified. Mitigation measures will be implemented as directed by SHPO and the tribe(s), and work will not resume at the discovery site without their consent.

- Stormwater: Stormwater runoff shall be handled through an Environmental Protection Agency Stormwater Construction General permit and the development of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP and stormwater BMPs will be implemented prior to, during, and after project construction to reduce the potential for erosion from runoff.

- Noise impacts from the project construction will be reduced by restricting work hours to reasonable times identified in the construction specifications.

- Implement any other appropriate BMPs, wherever possible, to avoid or minimize impacts from other construction activities.

The following additional permits will be required for this project:

- Land use permits from Bonneville County.
- Drilling permit from Idaho Department of Water Resources.
- Any other local, state, or federal permit required for activities taking place during project construction.

Beneficial Impacts: Overall, the completion of the proposed project will have long-term positive effects through improving the reliability of the drinking water system and improving fire flows.

Finding: The review process did not indicate significant environmental impacts would result from the proposed action. Consequently, a preliminary decision has been made that an environmental impact statement does not need to be prepared for the proposed project. Instead, a FONSI is hereby issued by DEQ. This decision is made following a careful review of the January 2014 *Comore Loma Water*

System Facility Planning Study and May 27, 2014 *Comore Loma Water System Facility Planning Study Environmental Information Document* (EID).

AVAILABILITY OF COPIES:

Copies of the notice of a FONSI, the January 2014 *Comore Loma Water System Facility Planning Study* and the May 27, 2014 *Comore Loma Water System Facility Planning Study Environmental Information Document* (EID) are available for public review on DEQ's website at www.deq.idaho.gov/public-comment-opportunities or at the following locations:

Idaho Department of Environmental Quality
Water Quality Division
1410 North Hilton
Boise, Idaho 83706
Grant/loan SERP contact: Mike May – (208) 373-0406

Idaho Department of Environmental Quality
Idaho Falls Regional Office
900 North Skyline Drive, Suite B
Idaho Falls, Idaho 83402
Regional Office contact: William Teuscher, P.E. – (208) 528-2666

The public will be informed about the proposed project and their opportunity for comment through the Idaho Falls *Post-Register*, one time in the June 6, 2014 publication.

Public Comments: Comments supporting or disagreeing with this decision must be submitted on DEQ's website www.deq.idaho.gov/public-comment-opportunities or addressed to the following contact:

Mike May
Idaho Department of Environmental Quality
Water Quality Division, Grant and Loan Program
1410 North Hilton
Boise, Idaho 83706

All comments must be postmarked or delivered on or before Monday, July 7, 2014. After an evaluation of public comment, DEQ will make a final decision. No administrative action will be taken on the project for at least 30 calendar days after publication of the draft FONSI notice.

Barry N. Burnell

Barry N. Burnell
Water Quality Division Administrator

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, ID 83706 • (208) 373-0502

C. L. "Butch" Otter, Governor
Curt Fransen, Director

May 30, 2014

Staci Dockery
Idaho Falls *Post-Register*
sdockery@postregister.com

RE: Legal notice publication: notification of a finding of no significant impact for the Comore Loma Water Corporation Drinking Water Improvements

Dear Ms. Dockery:

The Idaho Department of Environmental Quality requests the enclosed legal notice be published in your newspaper. This request satisfies the state rule requirement that the notice of an environmental determination be given in advance of the intended action. To comply with the aforementioned legal requirements and the dates contained in the legal notice, we request the legal notice be published one time, on one day, on June 6, 2014.

Please compress the legal notice by eliminating any unnecessary lines and spaces. A formatted legal notice is attached for your convenience. If you are unable to publish on the requested date, call for further instructions. If time permits, please send a proof copy to Mike May at the email address below for review.

Following publication, send one affidavit; one proof of publication; and the billing invoice to the following contact:

Dawn Shepherd
Idaho Department of Environmental Quality
1410 North Hilton
Boise, Idaho 83706

Failure to send the billing invoice to the address and contact person identified above could result in a delay in the processing of your invoice.

Thank you for your cooperation. Please contact Mike May at Michael.May@deq.idaho.gov or (208) 373-0406 if you have any questions.

MaryAnna Peavey, DEQ Loan Program Coordinator

Enclosure: Formatted legal notice

LEGAL NOTICE OF FINDING OF NO SIGNIFICANT IMPACT

Date: May 30, 2014

To: All Interested Government Agencies, Public Groups, and Individuals

Subject: Environmental determination for the Comore Loma Water Corporation Drinking Water Improvements

In accordance with the State Environmental Review Process (SERP) and the "Rules for Administration of Drinking Water Loan Program" (IDAPA 58.01.20), an environmental review has been performed and a finding of no significant impact (FONSI) issued by the Idaho Department of Environmental Quality (DEQ) for the following project:

Comore Loma Water Corporation Drinking Water Improvements
Bonneville County, Idaho

This environmental determination was made as a result of the review process indicating no significant environmental impacts would result from the proposed project. There may be several environmental effects from the referenced project as described below.

Short-term impacts may occur during project construction that include temporary disruption of the distribution system, increased noise, increased dust pollution, increased potential for stormwater runoff, and disruption of localized traffic conditions. The project contractor is responsible for managing the temporary disruptions of the system as follows:

- Air Quality: Temporary dust pollution impacts will be controlled as a condition of the construction specifications in accordance with the "Rules for the Control of Air Pollution in Idaho" (IDAPA 58.01.01.651). IDAPA 58.01.01.651 states that reasonable precautions shall be taken for dust control and suppression by using water or chemicals, applying dust suppressants, covering trucks, paving, and removing materials. In addition to the rule requirements, DEQ recommends that a dust prevention and control plan be implemented during construction of the project that includes best management practices (BMPs) to minimize dust pollution for fugitive dust control. Emergency generators must comply with Reciprocating Internal Combustion Engines National Emission Standards for Hazardous Air Pollutants.

- Cultural Resources: If archeological artifacts (such as beads, arrowheads, pottery, fabric, grave goods, glass, metal fragments, or other human-made objects that appear to predate 1960) or human remains (such as bones, bone fragments, or teeth) are inadvertently discovered during construction, ground disturbing activities shall cease and the State Historical Preservation Officer (SHPO), the Shoshone-Bannock Tribe and the Shoshone-Paiute Tribe shall be notified. Mitigation measures will be implemented as directed by SHPO and the tribe(s), and work will not resume at the discovery site without their consent.

- Stormwater: Stormwater runoff shall be handled through an Environmental Protection Agency Stormwater Construction General permit and the development of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP and stormwater BMPs will be implemented prior to, during, and after project construction to reduce the potential for erosion from runoff.

- Noise impacts from the project construction will be reduced by restricting work hours to reasonable times identified in the construction specifications.

- Implement any other appropriate BMPs, wherever possible, to avoid or minimize impacts from other construction activities.

The following additional permits will be required for this project:

- Land use permits from Bonneville County;
- Drilling permit from Idaho Department of Water Resources; and
- Any other local, state, or federal permit required for activities taking place during project construction.

Beneficial Impacts: Overall, the completion of the proposed project will have long-term positive effects through improving the reliability of the drinking water system and improving fire flows.

Description of the Project: The proposed project involves

- Replacement of an existing water storage tank with a new 422,000-gallon Tank 1;
- Installation of a booster pump station at Tank 1;
- Installation of new 533,000-gallon Tank 3;
- Installation of transmission pipe along Middle Fork Drive to Tank 3;
- Addition of flow meters to existing pump stations;
- Installation of pumps and electrical in existing structure on Big Bend Street;
- Completion of Well 7, well house and ancillary equipment at the site of an existing test well;
- Installation of SCADA improvements for improved alarm and control;
- Purchase of a portable emergency generator and installation of switchgear; and
- Replacement of broken valves and installation of 24 fire hydrants along existing water mains.

Copies Available: Copies of the full FONSI, the January 2014 *Comore Loma Water System Facility Planning Study* and the May 27, 2014 *Comore Loma Water System Facility Planning Study Environmental Information Document* (EID) are available for public review on DEQ's website at www.deq.idaho.gov/public-comment-opportunities or at the following locations:

Idaho Department of Environmental Quality
Water Quality Division
1410 North Hilton
Boise, Idaho 83706
Grant/loan SERP contact: Mike May – (208) 373-0406

Idaho Department of Environmental Quality
Idaho Falls Regional Office
900 North Skyline Drive, Suite B
Idaho Falls, Idaho 83402
Regional Office contact: William Teuscher, P.E. – (208) 528-2666

Public Comments: Comments supporting or disagreeing with this decision must be submitted on DEQ's website at www.deq.idaho.gov/public-comment-opportunities or addressed to the following contact:

Mike May
Idaho Department of Environmental Quality
Water Quality Division, Loan Program
1410 North Hilton
Boise, Idaho 83706

Such comments must be postmarked or delivered on or before Monday, July 7, 2014. Public comments will be considered in finalizing the planning phase of the project. No administrative action will be taken on the project for at least 30 calendar days from the date of publication.

Barry N. Burnell
Water Quality Division Administrator

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706 • (208) 373-0502

C.L. "Butch" Otter, Governor
Curt Fransen, Director

July 14, 2014

President John Buttles
Comore Loma Water Corporation
P.O. Box 1863
Idaho Falls, Idaho 83404

RE: Environmental determination for the Comore Loma Drinking Water Improvements (DW1407)

Dear Mr. Buttles:

A draft finding of no significant impact (FONSI) was issued by the Idaho Department of Environmental Quality (DEQ) on May 30, 2014 for the Comore Loma Drinking Water Improvements based on a careful review of the environmental information document prepared by Schiess & Assocates.

The draft FONSI was published on June 6, 2014 in the Idaho Falls *Post-Register*, newspaper of general circulation for the Comore Loma service area. Comments were received during the 30-day public comment period following publication. The final FONSI has been revised to include the comments received and the agency's responses.

This completes the environmental review of this project. William Teuscher, P.E., at the DEQ Idaho Falls Regional Office, (208) 528-2666, is your local contact on the referenced project. Please keep him informed of progress on the project. For questions regarding the environmental review, contact Mike May at Michael.May@deq.idaho.gov or (208) 373-0406.

Sincerely,

Barry N. Burnell

Barry N. Burnell
Water Quality Division Administrator

BNB: MLM:dls

Enclosures

c: MaryAnna Peavey, DEQ State Office (TRIM)
William Teuscher, P.E., Idaho Falls Regional Office
Paul H. Scoresby, P.E., Schiess & Associates (pscoresby@schiesseng.com)

FINDING OF NO SIGNIFICANT IMPACT

Date: July 14, 2014

To: All Interested Government Agencies, Public Groups, and Individuals

Subject: Environmental determination for the Comore Loma Drinking Water Improvements

In accordance with the State Environmental Review Process (SERP), and the "Rules for Administration of Drinking Water Loan Program" (IDAPA 58.01.20), an environmental review has been performed and a final finding of no significant impact (FONSI) is hereby issued by the Idaho Department of Environmental Quality (DEQ) on the project described below:

Project:	Comore Loma Drinking Water Improvements
Location:	Bonneville County, Idaho
DEQ Loan Number:	DW1407
Total Loan Project Cost:	$3,050,000

PURPOSE/SUMMARY OF IMPACTS:

Purpose of Project: The purpose of the proposed project is to protect public health and safety by addressing deficiencies in capacity, redundancy and fire flows.

Description of the Project: The proposed project involves

- Replacement of an existing water storage tank with a new 422,000-gallon Tank 1;
- Installation of a booster pump station at Tank 1;
- Installation of new 533,000-gallon Tank 3;
- Installation of transmission pipe along Middle Fork Drive to Tank 3;
- Addition of flow meters to existing pump stations;
- Installation of pumps and electrical in existing structure on Big Bend Street;
- Completion of Well 7, well house and ancillary equipment at the site of an existing test well;
- Installation of SCADA improvements for improved alarm and control;
- Purchase of a portable emergency generator and installation of switchgear; and
- Replacement of broken valves and installation of 24 fire hydrants along existing water mains.

Direct and Indirect Impacts: An environmental information document (EID) was prepared by Schiess & Associates (Schiess), consulting engineer for the Comore Loma Water Corporation (Comore Loma). Schiess and DEQ consulted with the appropriate state and federal agencies regarding relevant environmentally sensitive resources. Based on consultation with agency experts, Schiess and DEQ evaluated the potential short-term and long-term impacts, and the direct, indirect, and cumulative impacts of the drinking water improvement project. The evaluation emphasized site-specific components of the environment that are most likely to be impacted by the construction and operation of the proposed improvements. The results of the project evaluation indicate there will be environmental effects from the referenced project as described below.

Short-term impacts may occur during project construction that includes temporary disruption of the distribution system, increased noise, increased dust pollution, increased potential for stormwater runoff, and disruption of localized traffic conditions. The project contractor is responsible for managing the temporary disruptions of the system as follows:

- Air Quality: Temporary dust pollution impacts will be controlled as a condition of the construction specifications in accordance with the "Rules for the Control of Air Pollution in Idaho" (IDAPA 58.01.01.651). IDAPA 58.01.01.651 states that reasonable precautions shall be taken for dust control and suppression by using water or chemicals, applying dust suppressants, covering trucks, paving, and removing materials. In addition to the rule requirements, DEQ recommends that a dust prevention and control plan be implemented during construction of the project that includes best management practices (BMPs) to minimize dust pollution for fugitive dust control. Emergency generators must comply with Reciprocating Internal Combustion Engines National Emission Standards for Hazardous Air Pollutants.

- Cultural Resources: If archeological artifacts (such as beads, arrowheads, pottery, fabric, grave goods, glass, metal fragments, or other human-made objects that appear to predate 1960) or human remains (such as bones, bone fragments, or teeth) are inadvertently discovered during construction, ground disturbing activities shall cease and the State Historical Preservation Officer (SHPO), Shoshone-Bannock Tribe and Shoshone-Paiute Tribe shall be notified. Mitigation measures will be implemented as directed by SHPO and the tribe(s), and work will not resume at the discovery site without their consent.

- Stormwater: Stormwater runoff shall be handled through an Environmental Protection Agency Stormwater Construction General permit and the development of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP and stormwater BMPs will be implemented prior to, during, and after project construction to reduce the potential for erosion from runoff.

- Noise impacts from the project construction will be reduced by restricting work hours to reasonable times identified in the construction specifications.

- Implement any other appropriate BMPs, wherever possible, to avoid or minimize impacts from other construction activities.

The following additional permits will be required for this project:

- Land use permits from Bonneville County,
- Drilling permit from Idaho Department of Water Resources, and
- Any other local, state, or federal permit required for activities taking place during project construction.

Beneficial Impacts: Overall, the completion of the proposed project will have long-term positive effects through improving the reliability of the drinking water system and improving fire flows.

Finding: The review process did not indicate significant environmental impacts would result from the proposed action. Consequently, a decision has been made that an environmental impact statement does not need to be prepared for the proposed project. Instead, a FONSI is hereby issued by DEQ. This decision is made following a careful review of the January 2014 *Comore Loma Water System Facility Planning Study* and May 27, 2014 *Comore Loma Water System Facility Planning Study Environmental Information Document* (EID).

AVAILABILITY OF COPIES:

Copies of this final FONSI and supporting documentation upon which it is based are available on DEQ's website at www.deq.idaho.gov/water-quality/grants-loans/environmental-assessment.aspx or at the following locations:

Idaho Department of Environmental Quality
Water Quality Division
1410 North Hilton
Boise, Idaho 83706
Grant/loan SERP contact: Mike May – (208) 373-0406

Idaho Department of Environmental Quality
Idaho Falls Regional Office
900 North Skyline Drive, Suite B
Idaho Falls, Idaho 83402
Regional Office contact: William Teuscher, P.E. – (208) 528-2666

The public was informed about the proposed project and their opportunity for comment through the Idaho Falls *Post-Register*, one time in the June 6, 2014 publication.

Public Comments: Comments were submitted to DEQ for consideration during the 30-day public comment period. The comments submitted and the agency's responses are attached and are officially part of the Comore Loma Drinking Water Improvements record and the final FONSI. The attached responses to comments were sent to one commenter:

S. Paul Chambers
Bchambers167@msn.com

Barry N. Burnell

Barry N. Burnell
Water Quality Division Administrator

Response to Public Comments Received During the 30-Day Public Comment Period for the Draft Finding of No Significant Impact for the Comore Loma Drinking Water Improvements

July 10, 2014

Section 2: Non-EID and draft FONSI-Related Comments and Responses

NO TOPIC

Comment: Allow them to go ahead with project.

Response: Thank you for your comment. You did not say so, but I believe you were commenting on the Comore Loma Drinking Water Improvements. As a board member of the Groveland Water and Sewer District, do you have a professional connection to the project?

Reply: No connection but my daughters used that camp a few years ago. Paul

Response: The comment does not pertain to the issues addressed in the Draft FONSI or the contents of the Environmental Information Document for this specific project.