Source Water Protection Plan

Village of Los Lunas Water/Sewer Division

Public Water System # NM 3525332

Prepared for **Village of Los Lunas Water/Sewer Division**
Los Lunas, New Mexico

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1. Introduction

The New Mexico Environment Department (NMED) Drinking Water Bureau (DWB) assists communities in the protection of their drinking water system through the Source Water Protection Program. By participating in the program, communities can assess a water system to identify and manage actual or potential sources of contamination to the drinking water supply. The program consists of a two-step process; the first step involves identifying the area(s) to be protected, identifying actual and potential contamination sources, and evaluating the susceptibility of the drinking water source area to contamination.

NMED encourages communities to then complete the second step of the planning process by developing and implementing a Source Water Protection Plan (SWPP). The SWPP benefits the public water system by providing management and implementation strategies to ensure the security of the drinking water supply. Preventing contamination is much less expensive and easier than cleaning up a contaminated source or finding a new source.

This SWPP for the Village of Los Lunas (the Village) Water/Sewer Division, New Mexico, has been developed by Daniel B. Stephens & Associates, Inc. (DBS&A) using the *New Mexico Source Water and Wellhead Protection Toolkit* (NMED DWB, 2013). The SWPP identifies a Source Water Protection Team that has the responsibility of program development and implementation, thereby providing the community with the tools needed to prevent contamination of the Village's source water protection areas.

1.1 Purpose

The purpose of the Source Water Protection Program is to protect drinking water sources before they become contaminated. The SWPP provides the management tool for current and future

approaches to prevent source water contamination, thereby protecting the drinking water system and customer health.

1.2 Source Water Protection Program Background

U.S. Congress amended the Safe Drinking Water Act in 1996 to provide for the assessment and protection of sources of public water supply. The U.S. Environmental Protection Agency (EPA) provides information and encourages partnerships for source water protection planning. States completed source water assessments between 2002 and 2006 for all public water systems. The Village's source water assessment was completed in 2003 and is provided as Appendix A. States are now implementing strategies to help local communities use the information obtained from these assessments. States also may provide resources to help fund local protection activities, such as wellhead protection programs for groundwater and watershed management programs for surface water.

2. Source Water Protection Team

Table 1 lists the members of the Village's Source Water Protection Team.

Table 1. Source Water Protection Team

Name	Affiliation	E-mail
Ray Vigil	Water/Sewer Superintendent, Village of Los Lunas Water/Sewer Division	vigilr@loslunasnm.gov
Michael Jaramillo	Public Works Director, Village of Los Lunas	jaramillom@loslunas.gov
David Torres	Source Water Protection, NMED DWB	david.torres@state.nm.us

3. Water System Information

The Village of Los Lunas is located 19 miles south of the City of Albuquerque, in Valencia County, New Mexico. Water service is provided to the Village, which has an estimated population of 15,336 (2015 census estimate). Water service is also provided outside of the Village limits to residents, an elementary school, a former hospital and training school, and

1,200 inmates at the Central New Mexico Correctional Facility (CNMCF). The Village is a rapidly growing community that is projected to grow to 43,662 residents and 1,500 CNMCF inmates by 2050 (Lee Wilson, 2010). The water service has 6,205 connections (NMED DWB, 2015), with a service area of approximately 16 square miles (Figure 1).

All residents within the Village of Los Lunas are on the Village water service, and are not using private wells. There are, however, areas outside of the Village limits where private wells are used.

The Village water system (Figure 2) consists of the following infrastructure (Molzen Corbin, 2014):

- 4 production wells
- 4 arsenic treatment plants (1 per well)
- 5 steel water storage tanks
- 3 booster pump stations
- Approximately 126 miles of distribution line
- 3 major pressure zones, 2 smaller zones in higher terrain
- Approximately 760 fire hydrants

Water is pumped from the 4 production wells to the steel water storage tanks, which are strategically located for a mostly gravity-fed water system. Distribution lines range in diameter from 6 inches to 20 inches.

There are three major pressure zones within the service area: (1) the upper pressure zone, located west of Interstate 25 (I-25), (2) the middle pressure zone, located east of I-25 to the valley, and (3) the lower pressure zone, located within the valley bottom. There are also two much smaller pressure zones within the service area, located on the far west side in higher-lying terrain. Most of the water system components are 20 years old or newer. The older components include Well 3, built in 1969 and replaced in 1991, Well 4, built in 1987, and Tank 3, built in 1963 and refurbished in 1997 (Lee Wilson, 2010).

In 2010, coagulation-assisted oxidation/filtration systems were installed at each well for arsenic removal (Lee Wilson, 2010; Molzen Corbin, 2014). Typical recovery rates for the water filtration systems are approximately 90 percent (meaning that 10 percent of the raw water pumped is lost to backwash, filter to waste, etc.). Water is also disinfected using sodium hypochlorite generated on-site.

The Village of Los Lunas currently holds a permit to divert (i.e., pump) over 4,600 acre-feet per year (ac-ft/yr) (Molzen Corbin, 2014). As noted in the Los Lunas 40-year plan completed for the Village in 2010 (Lee Wilson, 2010):

> Because of the unprecedented growth from 2005 and 2007, the Village's very aggressive policy with respect to water rights transfers from developers, and the growth that these developers are planning, the Village now holds rights that are in excess of that amount. On August 11, 2008, the Village filed an Application to Increase Diversion and offset depletions with valid pre-1907 surface water rights. The proposed permit requests a diversion limit of 7,146 AFY which should allow the Village to meet its projected forty year demand"

The permit, with a total diversion (pumping) limit of 7,146 ac-ft/yr was approved in 2009. Consequently, the Village is expected to meet their projected year demand well beyond the 6,254 ac-ft/yr estimated for 2032 (Molzen Corbin, 2014).

The four active wells within the Los Lunas water system (Well 3, Well 4, Well 5, and Well 6) are designed to serve a geographic area of the community, but are also designed to provide water to other areas if another well goes down or if there is a higher demand in another area. Table 2 lists the condition of each well according to the master plan prepared in 2014 (Molzen Corbin, 2014).

The four wells are disinfected at the wellhead, and each well has an arsenic treatment system.

The Village system has five storage tanks that supply water by gravity to the pressure zones. Four of the tanks are located in two of the water system's three major pressure zones. One tank is located within the smaller pressure zone located in higher-level terrain. Table 3 lists the design capacity and pressure zone associated with each tank.

Table 2. Village of Los Lunas Well Information

Well ID	Status	Drill Date	Well Depth (feet)	Static Water Level	Well Diameter (inches)	Condition [a]	Well History
Well 1	Inactive	1939	—	—	—	—	Plugged and abandoned in 1991
Well 2	Inactive	1969	—	—	—	—	Plugged and abandoned in 1991
Well 3	Active	1969	605	182	14	Poor	Well, including booster pump station, was replaced entirely in 1991. Well is currently being rehabilitated (Lee Wilson, 2010). Arsenic treatment system installed 2009-2010. Well is currently used in standby and emergency mode only (Molzen Corbin, 2014).
Well 4	Active	1987	590	129	14	Good	Tank 4 also constructed in 1994 at well. Arsenic treatment system installed 2009-2010. Insufficient pressure at times to run the backwash cycle of arsenic removal facilities (Molzen Corbin, 2014).
Well 5	Active	1996	700	145	14	Good	Well 5 constructed in 1996, Tank 5 constructed in 1994. Arsenic treatment system installed 2009-2010.
Well 6	Active	2003	660	132	14	Good	Tank 6 and booster pump station also constructed in 2003 at well. Arsenic treatment system installed 2009-2010.
Well 7	Planned for future	—	—	—	—	—	Planning underway for construction of Well 7 (meeting notes).

[a] Molzen Corbin, 2014
bgs = Below ground surface
gpm = Gallons per minute

Table 3. Storage Tank Information

Storage Tank	Year Built	Design Capacity (million gallons)	Pressure Zone
3	1969	0.5	Middle
4	1987	1.0	Middle
5 [a]	1994	1.0	Upper
6 [a]	2007	1.5	Upper
7	2007	1.5	Upper (smaller zone)

[a] Tanks are adjacent to each other.

The water transmission/distribution pipelines range in diameter from 6 to 20 inches, and are either ductile iron or polyvinyl chloride (PVC), with the exception of asbestos cement (AC) lines located along Carson Drive just south of the Highway 6 Bridge on the west side of the Rio Grande (Molzen Corbin, 2014) (Figure 3).

The condition and deficiencies of the Village system were evaluated in detail by Molzen Corbin in 2014 (Molzen Corbin, 2014). The summary table from the evaluation is provided as Appendix B.

The most recent sanitary survey conducted by the NMED DWB (NMED DWB, 2015) (Appendix C) found no significant deficiencies in the system.

4. Hydrogeology

4.1 Regional Hydrogeology

The Village of Los Lunas lies within the Middle Rio Grande Basin, one of a series of generally south-trending structural basins comprising the Rio Grande Rift. The rift is an area of Cenozoic crustal extension originating in central Colorado and extending through New Mexico to Mexico and Texas (Johnson and Campbell, 2002). The Middle Rio Grande Basin is bounded on the north and south by convergence of the eastern and western structural boundaries of the rift. It covers the area within the Rio Grande Valley extending from about Cochiti Lake downstream to about San Acacia.

The basement rocks that underlie the sedimentary basin fill of the Middle Rio Grande Basin are composed of lower and middle Tertiary rocks in the central part of the basin (primarily sandstone and mudstone) with Mesozoic, Paleozoic, and Precambrian rocks near the basin margins. The aquifer system in the Middle Rio Grande Basin consists of the unconsolidated deposits of the Santa Fe Group and post-Santa Fe Group (basin and valley fill) of Quaternary age formed during the last 1.6 million years (USGS, 2002). The Santa Fe Group aquifer system is the main source of municipal water for the region. Depth to aquifer system varies widely, from less than 2 feet near the Rio Grande to as much as 1,180 feet in an area west of Albuquerque. Recharge of the aquifer comes primarily from mountains adjacent to the aquifer boundary and major tributaries.

The dominant surface water feature of the Middle Rio Grande Basin is the Rio Grande, a mostly perennial waterway that flows through the length of the basin, generally from north to south. The Rio Grande is the largest river in New Mexico and carries an average of about 1 million ac-ft/yr of surface water into the basin (USGS, 2002). Tributary streams, wastewater treatment plants, flood diversion channels from urban areas, and a large number of arroyos and washes contribute flow to the river. A network of canals and drains throughout the inner Rio Grande Valley play an important role in the Middle Rio Grande Basin surface water system. Water diversions are controlled at several dams in the region for irrigation uses. The current configuration of canal and drain systems along the Rio Grande was constructed beginning in the late 1920s and 1930s. The surface water and groundwater systems in the Middle Rio Grande Basin are intimately linked through a series of complex interactions. Most canals are unlined, and water from the canals seeps into the ground and recharges groundwater (USGS, 2002).

The best aquifer conditions (up to 1,500-foot thickness of relatively coarse sediments) are found in between the Rio Grande fault (east of the modern river valley) and the Isleta fault (west of the modern river valley) (Wilson, 2010). Other important attributes of the regional groundwater supply are that a large supply of water is yielded from the Rio Grande Valley; however, it is adversely affected by various water quality problems. For a municipal supply, this alluvium is most important because it is the connection between water in the river and water in the main aquifer. Saline water is likely beneath the main regional aquifer, and in the far west of the Los Lunas area (Wilson, 2010).

4.2 Water Sources

4.2.1 Source Water Quality

The Village water system is an all groundwater system. Arsenic treatment and disinfection (chlorination) systems are located at each well site.

4.2.2 Measured Water Levels and Production Rates

Table 4 shows production statistics for the Village's four active wells.

Table 4. Production Data by Well

Well	Pumping Capacity (gpm)	% of Total Production
Well 3	858	17.0
Well 4	1,180	23.4
Well 5	1,528	30.3
Well 6	1,470	29.3
Total	5,036	100.0

gpm = Gallons per minute

5. Village of Los Lunas Water Production

According to the water system information available from NMED, the Village system average daily production is 1.8 million gallons per day (mgd). The total design capacity is 7.266 mgd. The Village water supply is entirely from groundwater in Rio Grande alluvium and the Santa Fe Group. The water storage tanks are bolted steel with a total capacity of 5,530,000 gallons (NMED DWB, 2015).

With the installation of arsenic treatment at the wells, water supplies are adequate to meet the Village needs. The Village does not have any plans to supply any portion of its demand with surface water, as the regional aquifer near Los Lunas is capable of producing significant quantities of good-quality water in areas relatively near the valley (Lee Wilson, 2010).

It has been determined that the Village can continue to develop its groundwater supplies to provide its 40-year demand projections, with the best well locations in the transition zone from the valley to the West Mesa and to the south (Lee Wilson, 2010).

6. Water Supply Changes and Impacts

6.1 Historical Change and Impacts

The original system was constructed in 1939, and consisted of one well and a water supply tank that served a small Village population. In response to population growth and increasing commercial development, additional facilities were added in 1969. The Village continued to grow, especially beginning in the 1980s. Additional wells, tanks, and infrastructure were installed or refurbished from 1987 through 2003 (Table 2).

6.2 Need for Future Water Sources

In 2010, a 40-year water plan was prepared by Lee Wilson and Associates for the Village of Los Lunas. The executive summary discusses the need for future water sources (Lee Wilson, 2010):

> The Village of Los Lunas is a rapidly growing community and is situated such that substantial future growth is expected. By 2050, the Village water system is projected to serve 43,662 residents and 1500 inmates at the Central New Mexico Correctional Facility. Despite many factors that would be expected to increase per capita demand, the Village's effective conservation efforts have result [sic.] in a modest and stable per capita demand of 140 gpcd. Based on the projected population, the established per capita demand, and the reasonable expectation that at least some nearby water systems will hook up to the Village system, total water demand in 2050 is estimated at 7,146 AFY.
>
> The Village currently holds approximately 5,800 AFY of water rights, including assumed return flow credits and approval of pending applications. More than 2,600 AFY of these rights have been transferred to Village wells by developers, as required by Village ordinance to obtain subdivision approval. This mechanism will be the primary means for the Village to acquire additional rights,

which means that increased water rights holdings will be governed by actual growth of the Village.

Now that the Village water system has the capacity to treat the water supply for arsenic, the availability of groundwater is considered more than adequate to supply the projected demand. The Village Plan is consistent with the Middle Rio Grande Regional Water plan and the Forty Year planning statute and will have no adverse effect on other entities that hold water rights in the vicinity of Los Lunas. Prior transfers and previous comprehensive permits have never identified issues related to impairment, public welfare or conservation; future transfers will be subject to OSE approval after public notice and opportunity for protest.

The 2010 plan showed that per capita demand decreased from 1996 to 2007, even with growth in the commercial sector as a result of the Village's water rights transfer ordinance, which encourages residential water efficiency, a state-of-the-art water metering program, and a very aggressive approach to infrastructure efficiency (Lee Wilson, 2010). The Village has also implemented a number of water conservation programs, with planned implementation of additional water conservation measures.

As of 2010, the 40-year plan found that there appeared to be no limits to the Village's ability to meet its water needs from local groundwater.

7. Source Water Protection Area

Per NMED recommendations in the *New Mexico Source Water and Wellhead Protection Toolkit* (NMED DWB, 2013), a source water protection area (SWPA) is defined as the area within a 1-mile radius of each groundwater well. In this plan, the SWPA is further subdivided into four buffer zones:

- Zone A: radius of 0 to 200 feet from the water source
- Zone B: radius of 201 to 500 feet from the water source
- Zone C: radius of 501 to 1,000 feet from the water source
- Zone D: radius of 1,001 to 5,280 feet from the water source

In the 2003 source water assessment for the Village (Appendix A), NMED used the "Designated Fixed Radius" method to delineate the water sources. This method uses a 1,000-foot radius as the delineated source area or "capture zone." The capture zone is further subdivided into three zones: Zones A through C. Zone A represents a radius from 0 to 200 feet, Zone B is the area between 200 to 500 feet, and Zone C is the area between 500 to 1,000 feet. See the 2003 source water assessment (Appendix A) for NMED's methodology.

Zone D has been added to this plan per the updated NMED recommendations (NMED DWB, 2013), recommending an SWPA with a 1-mile radius. For conservative planning purposes, Zone D is useful in alerting water systems to additional potential sources of contamination (PSOCs).

8. Assessment of Potential Contamination Sources

NMED completed a source water assessment for the Village's water system in 2003 (Appendix A). At that time, a susceptibility analysis was performed using decision matrices. Susceptibility was defined as a combination of the vulnerability of a water source to contamination due to characteristics of the contaminant and the sensitivity of a water source to contamination due to characteristics of the source water area. The NMED assessment provides recommendations based on the rankings determined for sensitivity, vulnerability, and susceptibility. The results of the assessment ranked the susceptibility of the Village's water system as high.

DBS&A requested and received geographical information system (GIS) data used in NMED DWB's Source Water Protection Atlas (NMED DWB, 2016b), an interactive mapping tool that contains active and inactive drinking water sources, regulated sites, and other information. These GIS data were used to generate a map showing the Village's SWPAs and PSOCs (Figure 3). The information included in the Source Water Protection Atlas is not inclusive of all potential sources of contamination. Appendix D provides a comprehensive list of PSOCs with highlighted categories signifying the sources that are not included in the Source Water Protection Atlas.

Based on the NMED database and discussion with the Source Water Protection Team, PSOCs were identified within the SWPAs as potential threats to the water supply. Natural and human-caused sources of contamination were then identified and evaluated for their proximity to supply wells in the Village's water system.

PSOCs can be either naturally occurring or human-caused. Both types of PSOC occur within the Village's SWPAs. NMED has compiled an extensive list of human caused PSOCs (Appendix D). The human-caused PSOCs are listed in this report by the three-letter code assigned by NMED. Those known to occur in the Village's SWPAs are described in Table 5. Natural sources of contamination are listed in this report by name.

Table 5. Human-Caused Potential Sources of Contamination Occurring within the Village's SWPAs

Map Code	Land Use	Description	Contaminants of Concern
CFA	Fuel storage tanks - above ground	Non-service station tanks	Gasoline, diesel fuel, organic/inorganic chemicals
CFB	Fuel storage tanks - below ground	Non-service station tanks	Gasoline, diesel fuel, organic/inorganic chemicals
CSS	Gasoline service stations	Above/below ground storage tanks/operations	Gasoline, oils, solvents, automotive wastes, septage
AFI	Farming - irrigated cropland	Commercial producer - greater than 5 acres planted	Nitrate, ammonia, chloride, fertilizers, pesticides, herbicides
ADC	Drainage canals, ditches or acequias - unlined, wells (private, stock wells, and irrigation)	Runoff and infiltration	Pesticides, herbicides, fertilizers
MRP	Primary road, highway, or arterial	Public street, thoroughfare, highway, or main road	Gasoline, diesel fuels, metals, stormwater runoff, hazardous materials, radiological materials
RSF	Single-family residence - unsewered	Wastewater discharged to septic tank, or leach field or cesspool	Septage, pathogens, nitrate, ammonia, chloride, heavy metals, household pesticides, herbicides, cleaning agents and solvents, fuels

The well sensitivity rankings are based on the 2003 NMED source water assessment (Appendix A). The ranking of sensitivity of each well is based on depth to groundwater, well construction and integrity, and a calculation using the methodology known as DRASTIC (using

factors of depth to water, net recharge, aquifer media, soil media, topography, impact of vadose zone media, and aquifer hydraulic conductivity). The source water assessment assigned a sensitivity rating of moderately low to the four Village wells.

To identify and assess potential contamination risks to a system's water sources, vulnerability rankings have been assigned to each water source. These rankings are meant for planning purposes only. A vulnerability ranking of low, moderately low, moderate, moderately high or high is assigned based on (1) the number of PSOCs within the SWPA, (2) the proximity of PSOCs to the water source, and (3) the nature of the PSOCs. Vulnerability rankings are assigned based on Table 6.

Table 6. Vulnerability Ranking Description

Number of PSOC Events				Vulnerability Ranking
Zone A (0 to 200 feet)	Zone B (201 to 500 feet)	Zone C (501 to 1,000 feet)	Zone D (1,001 to 5280 feet)	
1+	10+	13+	15+	High
0	8–9	11–12	12–14	Moderately high
0	5–7	7–10	8–11	Moderate
0	3–4	4–6	5–7	Moderately low
0	0–2	0–3	0–4	Low

Table 7 lists mapped PSOCs for each well by zone.

Each of the four wells has 1 PSOC in Zone A and/or Zone B, and more than 15 PSOCs in Zone D, primarily due to private wells in the SWPA. The wells were therefore determined to have vulnerability rankings of high.

Table 7. Potential Sources of Contamination for the Village Wells

Buffer Zone	PSOC Code	PSOC Description	Actual (A) or Potential (P) Contamination	Number of Occurrences	Vulnerability Ranking
Well 3					
A	MRP	Utility/transportation right of way, major transportation corridor	P	1	High
C	ADC	Private well	P	1	
D	ADC	Ditches or acequias - unlined, arroyos	P	4	
	ADC	Private wells	P	9	
	CFB	Non-service station tank	P	1	
	CSS	Gasoline service stations (underground storage tank)	P	5	
	CSS	Gasoline service stations (leaking underground storage tank)	P	1	
Well 4					
B	MRP	Utility/transportation right of way, major transportation corridor	P	1	High
D	ADC	Ditches or acequias - unlined, arroyos	P	4	
	ADC	Private wells	P	22	
	—	Groundwater permit (ceased) – Allsup's Convenience Store 137	P	1	
	—	Groundwater permit (active) - Los Lunas Silvery Minnow Refugium	P	1	
Well 5					
B	MRP	Utility/transportation right of way, major transportation corridor	P	1	High
D	MRP	Utility/transportation right of way, major transportation corridor	P	1	
	ADC	Arroyos	P	2	
	ADC	Private wells	P	10	
	CSS	Gasoline service stations (underground storage tank)	P	5	
	CSS	Gasoline service stations (leaking underground storage tank)	P	1	
Well 6					
A	MRP	Utility/transportation right of way, major transportation corridor	P	1	High
D	ADC	Ditches or acequias - unlined	P	3	
	ADC	Private wells	P	84	
	CFA	Fuel storage tanks - above ground	P	1	

A well's susceptibility is determined by the intersection of its sensitivity and vulnerability rankings as shown on Table 8. Table 9 summarizes the susceptibility rankings for each well.

Table 8. Susceptibility Ranking Description

		Sensitivity Ranking				
		High	Moderately high	Moderate	Moderately Low	Low
Vulnerability Ranking	High	High susceptibility	High susceptibility	Moderately high susceptibility	Moderate susceptibility	Moderate susceptibility
	Moderately high	High susceptibility	Moderately high susceptibility	Moderately high susceptibility	Moderate susceptibility	Moderate susceptibility
	Moderate	Moderately high susceptibility	Moderately high susceptibility	Moderate susceptibility	Moderate susceptibility	Moderate susceptibility
	Moderately low	Moderate susceptibility	Moderate susceptibility	Moderate susceptibility	Moderately low susceptibility	Low susceptibility
	Low	Moderate susceptibility	Moderate susceptibility	Moderately low susceptibility	Moderately low susceptibility	Low susceptibility

Table 9. Susceptibility Rankings by Well

Well	Susceptibility Ranking
3	Moderate
4	Moderate
5	Moderate
6	Moderate

The four wells have a moderately low sensitivity based on the analysis done in the source water assessment. They have higher occurrences of PSOCs within the SWPAs, creating a situation in which potential contamination could readily occur. The combination of the wells moderately low sensitivity and high vulnerability rankings places the wells with moderate susceptibility.

8.1 Natural Sources of Contamination

The Village water system has levels of arsenic that are above the drinking water standards. All four wells had arsenic treatment systems installed in 2010, bringing the levels of arsenic to below drinking water standards. No other natural sources of contamination are found within the water system.

8.2 Human-Caused Sources of Contamination

Table 7 lists all of the human-caused PSOCs found within the Village's SWPAs.

Private wells, underground storage tanks (USTs), and leaking underground storage tanks (LUSTs) are the most common human-caused PSOCs in the Village service area.

9. Source Water Monitoring Plan

The Village currently conducts water monitoring at the entry points of the system for arsenic, heavy metals, radionuclides, synthetic organic contaminants (SOCs), volatile organic compounds (VOCs), cyanide, fluoride, nitrate, and nitrite. Appendix E provides the sampling schedule as shown on the NMED Drinking Water Watch (NMED DWW, 2016).

10. PSOC Monitoring and Control Plan

The Village monitors water quality in accordance with state and federal requirements. In addition, the Village tests water quality at the individual wells on a regular basis. No additional monitoring of the sources is warranted.

In addition, the Village has an emergency response plan for their potable water system. This plan is included as Appendix F.

11. Conclusions and Recommendations

Private wells, USTs, LUSTs, and unlined ditches and acequias, among others, represent PSOCs to the Village's water supply wells. The Source Water Protection Team should review the draft map showing the PSOCs and add PSOCs from local knowledge that are not found in the state database. A comprehensive list of types of PSOCs is provided in Appendix D.

DBS&A makes the following recommendations for the Village's implementation of the Source Water Protection Program:

- The Source Water Protection Team should meet annually to review the PSOCs and any changes to the system's sources, including new well construction. This is especially critical in light of future development such as the planned construction of the Facebook data center.

- As the Village extends service to residences currently served by domestic wells and septic systems, proper closure and abandonment of the system and wells should be ensured.

- This SWPP document and the map of PSOCs should be updated on an annual basis.

- The Source Water Protection Team should participate as necessary in regulatory meetings and hearings on facilities within the Village's SWPAs.

- The members of the Source Water Protection Team may change over time. Representation on the team should be considered to inform the plan and implement recommended actions. For example, it may be prudent to include someone from Valencia County as part of the Village planning efforts for future development impacts on the water system.

- A public information program should be developed related to source water protection. This program would educate the public about the Village's water sources, potential threats to those sources, and measures that the public can take to protect water sources, and would encourage the public to report PSOCs to the Source Water

Protection Team. Options for communicating with the public include meetings, advertisements, flyers, brochures, posters, questionnaires, and community and school events. An information flyer that has been prepared for the Village is provided as Appendix G.

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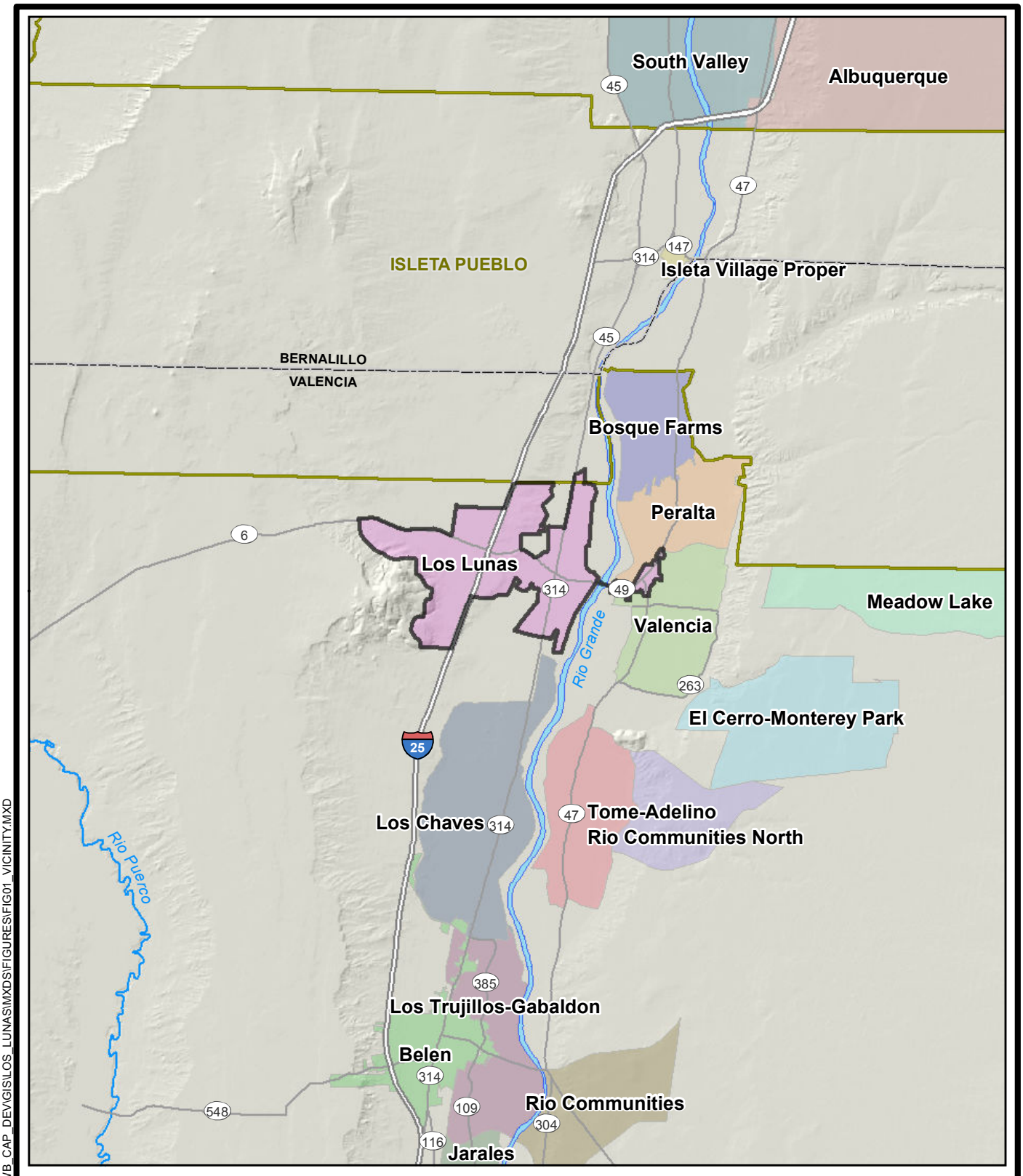
Figures



VILLAGE OF LOS LUNAS
SOURCE WATER PROTECTION PLAN
Vicinity Map

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Figure 1

ISLETA PUEBLO

Well 4
PRV-6
Tank 4
PRV-5
Well 3
PRV-1
Tank 3
Tank 5
Tank 6
Tank 7 Zone
PRV-7
Well 5
PRV-9
Upper Zone
Middle Zone
PRV-3
Tank 7
Lower Zone
PRV-4
Well 6
PRV-8
Rio Grande

6
314
25
47
49
263

N

0 0.25 0.5 Miles

Explanation

- Village limits
- Pueblo
- Road
- Well
- Tank
- PRV
- Pressure zone
- Pipeline

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1/12/2017 JN NM15.0090

VILLAGE OF LOS LUNAS
SOURCE WATER PROTECTION PLAN
Water System

Figure 2

Explanation

- Village limits
- Pueblo
- Road
- Well
- Arroyo
- Acequia/drain
- Source water protection area

Buffer zone

- 200
- 500
- 1000
- 5280

- Asbestos cement line
- Abatement site
- Leaking underground storage tank site
- Underground storage tank facility
- AST facility
- NPDES permit
- OSE well in source water protection area

Groundwater permit

- Active
- Ceased

N

0 0.25 0.5 Miles

ISLETA PUEBLO

Well 4

Well 3

Well 5

Well 6

6

25

314

49

47

Rio Grande

2014 USDA NAIP aerial imagery

S:\PROJECTS\NM15.0090_NMED_DWB_CAP_DEV\GIS\LOS_LUNAS\MXDS\FIGURES\FIG03_POTENTIAL_CONTAM_SOURCES.MXD

VILLAGE OF LOS LUNAS
SOURCE WATER PROTECTION PLAN
Potential Sources of Contamination

Daniel B. Stephens & Associates, Inc.
1/12/2017
JN NM15.0090

Figure 3

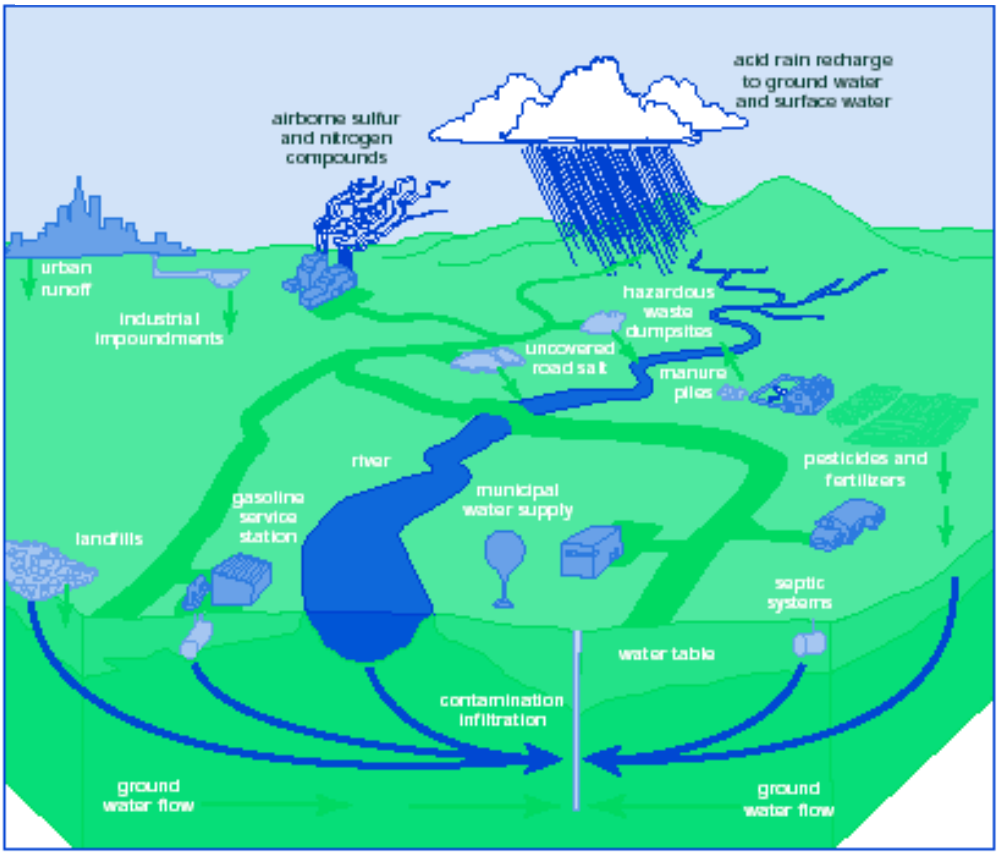
Appendix A

NMED Source Water Assessment

Source Water Assessment & Protection Program
Report of Los Lunas Water System Water Utility

Public Water System # 25332

Potential Threats to Drinking Water Sources



New Mexico Environment Department -
Drinking Water Bureau
May 2003
Funded under *the Federal Safe Drinking Water Act Amendments of 1996*

TABLE OF CONTENTS

ACRONYMS

ARCGIS	ArcView Geographic Information System
BMP	Best Management Practices
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
DWB	Drinking Water Bureau
EPA	Environmental Protection Agency
GGAP	Ground-Water Protection Policy and Action Plan
GPAB	Ground Water Protection Advisory Board
GPD/FT^2	Gallons Per Day Per Foot Squared
GPS	Global Positioning System
LU	Land Use
MCL	Maximum Contaminant Level
NMED	New Mexico Environment Department
NMED-DWB	New Mexico Environment Department Drinking Water Bureau
PIC	Policy Implementation Committee
PSOC	Potential Sources of Contamination
RCRA	Resource Conservation and Recovery Act
SDWA	Safe Drinking Water Act
SWA	Source Water Assessment
SWAPP	Source Water Assessment and Protection Program
WSS	Water Supply System

SOURCE WATER ASSESSMENT AND PROTECTION PLAN PROCESS FOR THE LOS LUNAS WATER SYSTEM WATER SYSTEM

INTRODUCTION

The New Mexico Environment Department Drinking Water Bureau's (NMED-DWB) *Source Water Assessment and Protection Program* (SWAPP)[1] is a federally funded national program. The program is part of a national effort to prevent adverse effects to human health and the environment and to manage and protect the environmental integrity of states' ground water resources.

The SWAPP is intended to be an information-gathering tool that identifies, evaluates, and prevents contaminants[2] from polluting public drinking water systems. As the lead agency under SWAPP responsible for source water protection of public drinking water supplies, NMED-DWB is attaching this *Request for Participation in the New Mexico Source Water Protection Plan Process* to your completed Source Water Assessment Report, and hopes that your water utility will join the Source Water Protection Plan (SWAPP) portion of this program.

Your choice to continue with SWAPP is voluntary, however, your participation will be a valuable contribution to both your community and the state. Source water protection benefits all of New Mexico and may be measured in many ways.[3] In recognition of the importance of this program toward the protection of the state's water resources, the executive branch agency will give special recognition and commendation to water utilities with approved source water protection plans that are also in compliance with the Safe Drinking Water Act. **Plan approval is conducted by NMED-DWB and is based on the satisfactory completion of all steps outlined in the Source Water Protection Plan Template** (see Appendix J).

SOURCE WATER PROTECTION PLAN PROCESS

A SWAPP incorporates six steps. Steps 2-4 have been completed for your water utility by NMED-DWB, and are incorporated in this addendum. NMED-DWB will continue to work with you toward the development, adoption, and management of an approved SWAPP, should you choose to proceed. The remainder of this report describes the six steps for developing a SWAPP, incorporates the findings of the assessments conducted by NMED-DWB, and gives examples of SWAPP tools and documents. The six steps of the SWAPP are as follows:

1. Formation of a Community Planning team
2. Delineation of Source Water Protection Areas (*completed by NMED-DWB under SWA*)
3. Inventory of Actual and Potential Sources of Contamination (*completed by NMED-DWB under SWA*)
4. Completion of a Susceptibility Analysis (*completed by NMED-DWB under SWA*)
5. Management of Source Water Protection Areas
6. Planning for Existing and Future Events / Contingency Protocol

[1] SWAPP incorporates the goals and mandates of the *Safe Drinking Water Act* such as the *Source Water Assessment Program* and the *Wellhead Protection Program* described in Sections 1453 and 1428 of the *Federal Safe Drinking Water Act Amendments of 1996*, respectively. The general goals of SWAPP are the identification and management of existing and potential sources of pollution as they may impact public drinking water sources.

[2] The Contaminants of Concern (COC) (refer to your utility's Source Water Assessment) are defined as broad land-use categories, facilities, or activities that store, use, or produce as a product or by-product any contaminants regulated under the federal *Safe Drinking Water* Act, including microbiological contaminants giardia lamblia, cryptosporidium, and total coliform bacteria, and synthetic organic contaminants included in the New Mexico *Pesticide Management Plan*.

COC identified in this report have been determined by NMED-DWB as posing a *significant* likelihood of having the potential to impact drinking water sources. For example, COC that were not considered as having the potential to impact drinking water sources are small quantities of highly volatile organic chemicals that would most likely volatilize upon release into the environment.

[3] Source water protection is a relatively new and pro-active approach for ensuring safe and reliable sources of drinking water. Benefits range from protecting human health and the quality of life to maintaining tourism and property values. Benefits may also be measured by considering what the costs might be if the water source was to become polluted. Costs incurred from polluted water may include the costs of treatment, land purchase and well drilling (for locating a new water supply) or, in the worst case, the costs of the complete loss of a water supply utility.

Compliance with other programs may also result in savings. For instance, the federal *Safe Drinking Water Act Amendments of 1996* requires treatment under the Disinfection Byproducts Rule, however, systems with cleaner water sources will naturally require less disinfection to begin with. Further, sampling waivers issued because of the SWAP Plan may reduce the frequency of sampling requirements, which would result in the reduction of sampling costs.

STEP 1 FORM A COMMUNITY PLANNING TEAM

Forming a community planning team (team) may be as simple as calling someone who may be interested in participating on the team such as a resident near a public water source(s). The team should include everyone that is interested in and/or may be affected by the SWAPP. Other potential team members may include a utility or public works employee, a geologist, hydrologist, or engineer, a citizen with computer and/or public relations skills, an attorney, and Realtor. In addition, local governments that are not directly involved in your water utility may in fact be the legal authority for authorizing and enforcing protection measures and, thereby, may help with the adoption of a protection plan. Examples of local governmental entities include commissioners, council members, and mayors.

The team determines the goals of the program and the roles and responsibilities of the participants. The team must make every effort to involve the public in plan development and implementation, and to secure the public's support.[4] Other tasks include the development of protection plan management strategies (refer to Step 5, Manage the Source Water Protection Area), the establishment and continued evaluation of both short- and long-term goals (see Step 6, Planning for Existing and Future Events / Contingency Protocol), record keeping, and ensuring that the public receives proper notification during all of the relevant stages of the process. The team submits the SWAPP[5] to NMED-DWB for approval (documentation of source water management control tools such as agreements, ordinances, regulations, and public notice(s), etc., should be attached).

STEP 2 DELINEATE SOURCE WATER PROTECTION AREAS (*COMPLETED BY NMED-DWB*)

The State of New Mexico's *Designated Fixed Radius* method was used to delineate each of the system's water sources. The method utilizes a 1,000-foot radius (72.12 acres) as the delineated source area or *capture zone,* which is further subdivided into three zones. Zone A represents a radius that is from 0 to 200 feet from the wellhead, Zone B 200 to 500 feet from the wellhead, and Zone C is the area between 500 to 1,000 feet of the wellhead. Geographical Information Systems ArcView 8.0 was used to generate the maps (Appendix A). You may decide to customize or use another delineation method to produce the maps or use these to satisfy the requirements for this Step.

The identified contaminants were assembled through database[6] tables and shapefiles, sanitary surveys, water system and DWB staff review within the context of the limitations of resources, and available information. As shown in Appendix A, PSOC identified from the databases, such as UST facilities are shown as points, while the three-letter text code (ISM in the example) indicates the PSOC was identified during an onsite survey. The map legend remains consistent throughout the SWAPP.

STEP 3 INVENTORY ACTUAL AND POTENTIAL SOURCES OF CONTAMINATION (*COMPLETED BY NMED-DWB*)

PSOC regulated by the *Safe Drinking Water Act* (SDWA) were inventoried as required under the SWA process. Only facilities and/or land use where potential use of SDWA regulated contaminants may pose a **significant** likelihood of impacting ground water were identified as PSOC. PSOC, along with their associated codes, and Contaminants of Concern generally associated with the PSOC are listed in Appendices C and D, respectively.

The identified contaminants were assembled through database[7] tables and shape files, sanitary surveys, water system and DWB staff review within the context of the limitations of resources and available information. Table 1 shows PSOC identified from the map example (Appendix A). PSOCs identified from the databases, such as UST facilities are shown as points, while the three-letter text code (RSF) indicates the PSOC was identified during an onsite survey. Water systems, which choose to develop a Source Water Protection Plan, may to be provided with additional information.

STEP 4 CONDUCT A SUSCEPTIBILITY ANALYSIS (*COMPLETED BY NMED-DWB*)

Susceptibility analyses provide a method to identify and prioritize potential risks to human health and the environment by identifying the water sources most likely to be impacted by a contaminant. Once completed, consideration should be given to

[4] Keeping records of public participation (i.e., sign-in sheets) is important and may help you to recall public involvement, in addition to serving as a list of possible future team members.

[5] A cover sheet should be attached and signed by an official of the governing entity when returning the SWAPP. For water utilities helping to develop SWAP Plans on a watershed scale, there may be several governing entities.

[6] Drinking water supply systems, Federal Toxic Release Inventory, Underground Injection Control (including Monitoring Wells and Impoundments, Federal Permit Facility, Federal Industrial Permit Facilities, Oil Conservation District Wells, Petroleum Storage, Roads (by county), Railroads, State Impaired Waters (303 d List), Land Use/Land Cover (by county), and Hazardous and solid waste facilities. Base maps were produced using *All Topo Maps*. All data was projected to North American Datum 83 /Universal Transverse Mercator Zone 13.

[7] Drinking water supply systems, Federal Toxic Release Inventory, Underground Injection Control (including Monitoring Wells and Impoundments, Federal Permit Facility, Federal Industrial Permit Facilities, Oil Conservation District Wells, Petroleum Storage, Roads (by county), Railroads, State Impaired Waters (303 d List), Land Use/Land Cover (by county), Hazardous and solid waste facilities. Base maps were produced using *All Topo Maps*. All data was projected to North American Datum 83 /Universal Transverse Mercator Zone 13.

the effects on human health the contaminants may pose, such as *acute* (appearing within hours or days) verses *chronic* (exposure over many years) health effects. Management plans should reflect the findings of the assessments, by directing the development and implementation of the management plan to the sources with the highest susceptible ranking and with the potential for causing acute adverse human health effects.

Table 1

INVENTORY OF ACTUAL AND POTENTIAL SOURCES OF CONTAMINATION

Description of Contaminant	Actual Contamination	Potential Contamination	Distance from Wellhead and/or Zone of Influence	Number of Sources of Contamination (may be expressed by a range i.e., 2-4).
Monitoring Well	No	Yes	Zone A	1+
Hazardous/Solid Waste Generator	No	Yes	Zone B	2-4
Petroleum Storage	No	Yes	Zone B	2-4
Primary Highway	No	Yes	Zone B	2-4
Railroad	No	Yes	Zone B	2-4
Single family Residences – Unsewered	No	Yes	Zone B	2-4
Abandoned Well	No	Yes	Zone C	3-4
Arroyo	No	Yes	Zone C	3-4
Federal Toxic Release Inventory Site	No	Yes	Zone C	3-4
Railroad	No	Yes	Zone C	3-4
Secondary Highway	No	Yes	Zone C	3-4

NMED-DWB susceptibility analysis was performed using decision matrices. Susceptibility was defined as a combination of the **vulnerability** of a water source to contamination due to characteristics of the contaminant, and the **sensitivity** of a water source to contamination due to characteristics of the source water area (Appendix B).

Vulnerability Rank

Once identified according to zone of influence, a vulnerability[8] rank was determined based on the number of PSOC located in a particular zone. The vulnerability rank may have been increased due to one or more of the following:

1. State of New Mexico Environment Department *Drinking Water Regulations* (regulations) for compliance samples were exceeded: 3 or more violations within 12 months, with a set period of review.

2. Three or more categories of PSOC occurred within the same zone of influence.

[8] This report uses the term *vulnerability* to express the characteristics of contaminants in terms of the likelihood of 1) discharge, 2) spill or accidental release, and 2) the number of potential contaminant sources according to their location to ground water. Although determining vulnerability based on the number and location of the PSOC in relation to the wellhead neglects the basic chemical characteristics of the contaminants such as density and volatility, and the likelihood of accidental spills or releases, the number and location of contaminant sources capable of impairing a supply well are easily counted and provide information relevant to initial protection planning efforts. ***Please note that vulnerability is not used to describe hydrogeologic related factors. Hydrogeologic factors are incorporated in the sensitivity analysis using DRASTIC (see footnote 9).***

3. Records maintained for facilities operating under a New Mexico Environment Department (NMED) Ground Water Discharge Plan, Abatement Plan, Solid Waste Facility Permit, or Underground Storage Tank registration, or operating under an United States Environmental Protection Agency National Pollutant Discharge Elimination System permit or any other federal or state permitting system indicate the effectiveness of treatment processes used and the compliance status of the facility with the terms and conditions of its permit.

Tables 2 and 3 show the vulnerability-ranking scheme and an example of a PSOC inventory determined from the map shown in Appendix A. As shown in Table 3, the vulnerability rank that corresponds to the example inventory is "low" as Zone B and C are the zones where the highest Vulnerability Rank (refer to Appendix A).

Table 2

PSOC RANKING DETERMINATION				
	Zone			Ranking
	Zone A	Zone B	Zone C	
Number of PSOC in Zone	1+	10+	15+	high
	0	8-9	12-14	moderately high
	0	5-7	8-11	moderate
	0	3-4	5-7	moderately low
	0	0-2	0-4	low

Sensitivity Rank

The sensitivity of a water source to contamination was determined from ranks calculated for the following four matrices: 1) depth to groundwater (the upper most screened interval), 2) well construction/integrity information, 3) construction and integrity of the well, and 4) calculated DRASTIC [9] Index (refer to Appendix B for matrices).

Table 3

PSOC VULNERABILITY INVENTORY AND RANKING

Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Base Map	Primary Highway	B	0-2	Low
Base Map	Secondary Highway	B	0-2	Low
Appendix K	ISM	C	0-4	Low
Map Legend	Petroleum Storage	C	0-4	Low

Table 4 provides definitions, explanatory notes, references, and additional information related to the sensitivity evaluation criteria.

[9] *DRASTIC* is a method developed in 1987 by the National Ground Water Association to evaluate the potential for ground water contamination in any hydrogeologic setting in the United States, and is an acronym for: depth to water (D); net recharge (R); aquifer media (A); soil media (S); topography (T); impact of vadose zone media (I); and aquifer hydraulic conductivity (C). The method assigns a relative rank and weight to each of these factors to determine the relative sensitivity (high, moderately high, moderate, moderately low, or low) of a given supply well to surface-derived contamination. The higher the DRASTIC Index, the more sensitive the well is to contamination.

Table 4	
SENSITIVITY ANALYSIS DEFINITIONS, EXPLANATORY NOTE, and INFORMATION SOURCE (S)	
General Information	
Water Supply Source Name	The name of the well assessed.
Source Type	Where the drinking water comes from, i.e. ground water, surface water, or ground water under the direct influence of surface water.
Susceptibility Analysis ate	The date the susceptibility was completed.
Date of PSOC Inventory	The date the onsite inventory was completed.
Hydraulic Conductivity	A description of the rate at which water can move through a permeable medium (vertical movement).
Depth of Screened Interval	The top of the well screen where water is allowed to enter the well casing.
Information Assessment – Administrator and operator knowledge of the water supply system	
Well Casing	Generally determined from well logs.
Location of Screened Interval (s)	Generally determined from well logs.
Total Completion Depth	The depth to water measured from ground surface. Generally determined from well logs.
Pump, Type, Size, and Setting	Generally determined from well logs.
Drilling Log or Equivalent	A log produced by the driller of the well – usually filed at the Office of State Engineer.
DRASTIC Index Parameters (also see footnote 8)	
Depth to Water	The depth to water from ground surface. Generally determined from well logs.
Net Recharge	The amount of annual rainfall.
Aquifer Media	The aquifer's primary media.
Soil Media	Values generally determined estimated from the Soil Conservation Service's Soil Surveys.
General Topography	The slope of the ground surface (estimated from U.S. Topographic maps).
Hydraulic Conductivity	A description of the rate at which water can move through a permeable medium (vertical movement).
Impact of Vadose Zone Media	Primary vadose zone material type.
Source Area Delineation Data	
Map Legend	Map legend criteria reflect PSOC such as petroleum storage sites, hazardous and solid waste generator sites, and toxic inventory release facilities. In addition, topography and general land use are shown. The map legend remains constant throughout the assessment (see footnote 6).
Source Area Delineations	The State of New Mexico's *Designated Fixed Radius* method for the State Sanitary Survey is a 1,000 feet, and is based on an arbitrarily chosen radius.

Rankings were then entered as shown in Table 5, and a final *point sum* determined. Table 6 shows the final ranking criteria for sensitivity.

Table 5	
COMPOSITE SENSITIVITY RANKING	
Rank for Depth of Screened Interval	
High (25 points)	
Moderately High (20 points)	
Moderate (15 points)	
Moderately Low (10 points)	
Low (5 point)	
Rank for Well Construction Records	
High (25 points)	
Moderately High (20 points)	
Moderate (15 points)	
Moderately Low (10 points)	
Low (5 point)	
Rank for Integrity of Construction	
High (25 points)	
Moderately High (20 points)	
Moderate (15 points)	
Moderately Low (10 points)	
Low (5 point)	
Rank for DRASTIC Index	
High (25 points)	
Moderately High (20 points)	
Moderate (15 points)	
Moderately Low (10 points)	
Low (5 point)	
Point Sum	
Rank Assigned (see Ranking Guide, below)	

Table 6		
COMPOSITE SENSITIVITY RANK ASSIGNED		
Sum of Sensitivity Points	**Composite Sensitivity Range**	**Composite Rank Assigned**
90-100	high	
70-85	moderately high	
50-65	moderate	
30-45	moderately low	
20-25	low	

Susceptibility Rank

Together, the rankings determined from the vulnerability and sensitivity analysis were merged as shown in table 7. Susceptibility ranks were increased where professional judgment or extenuating circumstances and/or facts warranted an increased rank such as if a nearby contaminant plume was know to exist but falls outside the delineated areas. Further, ranks were increased where systems were reported on quarterly chemical monitoring and/or NMED-DWB Escalation reports and where land use and/or land cover in the source area of delineation that fell under one or more of the following categories: 1) agricultural, 2) rangeland, 3) commercial, industrial, transportation, and utility, 4) open water and/or irrigation, and 5) urban/recreational grass area.

Table 7						
SUSCEPTIBILITY RANKING						
Sensitivity Ranking						
Vulnerability Ranking		**High**	**Moderately High**	**Moderate**	**Moderately Low**	**Low**
	High	High	high	moderately high	moderately high	moderate
	Moderately High	High	moderately high	moderately high	moderate	moderate
	Moderate	moderately high	moderately high	moderate	moderate	moderately low
	Moderately Low	moderately high	moderate	moderate	moderately low	moderately low
	Low	Moderate	moderate	moderately low	moderately low	low

Increases in rank are noted in the *Final Rating & Comments* column of Table 8. Ranking of the entire water was determined by using the median of the source ranks (only applicable where water utilities have multiple water sources). The final rank is noted in *Assessment Findings and Summary* (refer to page 11).

Table 8	**SOURCE SUSCEPTIBILITY RANKING**				
SOURCE NAME	**Sensitivity Rank**	**Vulnerability Rank**	**Susceptibility Rank**	**Operational Exceptions**	**Final Rank**
WELL # 3	Moderately Low	High	Moderately High	LU – Rangeland LU – Transportation LU – Commercial	High
WELL # 4	Low	High	Moderately Low	LU – Rangeland	Moderate
WELL # 5	Low	High	Moderately Low	LU – Rangeland LU – Transportation LU – Commercial	Moderately High

STEP 5 MANAGE THE SOURCE WATER PROTECTION AREA

The goals of managing a source water protection area are pollution prevention and management of threats to source water. Management "measures or tools" range from promoting pubic education through public service radio campaigns where there are little to no associated costs, to developing complex protection plans involving new land acquisitions, where financing may be a considerable factor of the management plan. In addition, management of source water protection areas may involve a variety of strategies each targeted to address a specific goal. It may be most effective to adopt a simple plan and continue to update it; however, efforts should focus on water sources with the highest susceptibility to contamination. Primary categories of protection measures/tools include the following (also refer to Appendix G, Examples of Source Water Protection Planning Categories, Measures and Tools):

- Public education such as giving presentations at schools, business meetings, and government forums, and participation in water-related events sponsored by other groups and organizations;
- Best management practices (BMPs) such as preventing leaks or spills by installation of "secondary containment" equipment;
- *Regulatory controls such as* zoning ordinances and subdivision controls, construction and operating standards, health regulations (such as setting setback requirements for septic tanks and/or sewer lines from drinking water wells), and permitting or inspections;
- Point source pollution restrictions, requirements, and/or controls for fixed PSOC such as waste processing plants and inorganic sources such as salts, nutrients, and heavy metals; and

- Land acquisitions, land leasing, economic incentives such as cost-share programs, and conservation easements.

Implementing protection measures, along with water quality monitoring, capacity[10] building, and treatment can significantly protect a water source.

STEP 6 PLAN FOR EXISTING AND FUTURE EVENTS / CONTINGENCY PROTOCOL

Where the management of source water protection areas may help reduce the likelihood of water pollution and help focus efforts on the successful treatment of contaminated water, planning for future events that are both expected and unexpected is also a necessary part of the SWAPP. Contingency planning provides the information that is helpful during these events. This includes emergency contact information, protocols and strategies, and revenues from budgeting.

Determine if there are local emergency response teams that your water utility could contact for assistance. On the state level, the State of New Mexico Environment Department Office of Emergency Preparedness organizes assistance for damage caused by events such as wildfires, and will provide water utilities with information regarding damage assessments related to drinking water systems. Further, the New Mexico National Guard is the entity responsible for providing public water utilities with a source of water under emergency conditions.[11] When water outages may not be classified as "emergency conditions," water utilities should know and develop their options of supplying their customers with safe drinking water. Categories of contingency planning that should be addressed in your SWAPP include the following:

- Water outages due to contamination, mechanical or physical breakdown of a system, and natural disasters such as floods and drought;
- Water conservation;
- Accidental leaks or spills;
- Land acquisition for future water supplies; consider and/or identify where a new well could be drilled should a new water source be required; and
- Land acquisition as a source water protection measure.

ASSESSMENT FINDINGS AND SUMMARY

The Susceptibility Analysis of the Los Lunas Water System water utility reveals that the utility is well maintained and operated, and the sources of drinking water are generally protected from potential sources of contamination based on well construction, hydrogeologic settings, and system operations and management. The susceptibility rank of the entire water system is **High.**

NMED-DWB staff is available to help your water utility continue with the development of the SWAP Plan, which may include providing additional mapping, (refer to Step 2), evaluation of BMP (refer to Step 5), or providing emergency planning options (refer to Step 6). This SWAPP Report is intended primarily to provide water utilities with information about the susceptibility of their water supplies to contamination, and to help water utilities initiate Source Water Assessment and Protection Plans for the protection of theses water resources.

The remainder of this report 1) offers a template and information for developing a source water protection plan for your water utility, 2) provides examples of management categories commonly utilized in protection planning, and 3) includes an exercise (Appendix I) to help illustrate some of the SWAPP steps.

REPORTING:

The report was provided to the Los Lunas Water System Water Supply System for initial review, and is now available at the State of New Mexico Environment Department Drinking Water Bureau, 525 Camino de Los Marquez, Suite 4, Santa Fe, NM 87505.

Copies may also be requested by emailing the Drinking Water Bureau at SWAPP@nmenv.state.nm.us or by calling (505) 827-7536 (toll free 1-877-654-8720). Please include your name, address, telephone number, and email address, and the name of the water utility. *NMED-DWB may charge a nominal fee for paper copies.*

[10] Capacity Development program support services are available on a priority basis to assist eligible public water systems enhance *technical, managerial,* and *financial* capacities.

[11] The State of New Mexico recognizes emergency conditions according to categories Type A and Type B. Type A conditions are major state or county disasters, including nuclear, earthquakes, volcano eruptions, floods, hurricanes, and tornadoes. Type B disasters are water outages due to drought, major contamination of a system's basic water source, and major destruction or impairment of a system's physical facilities.

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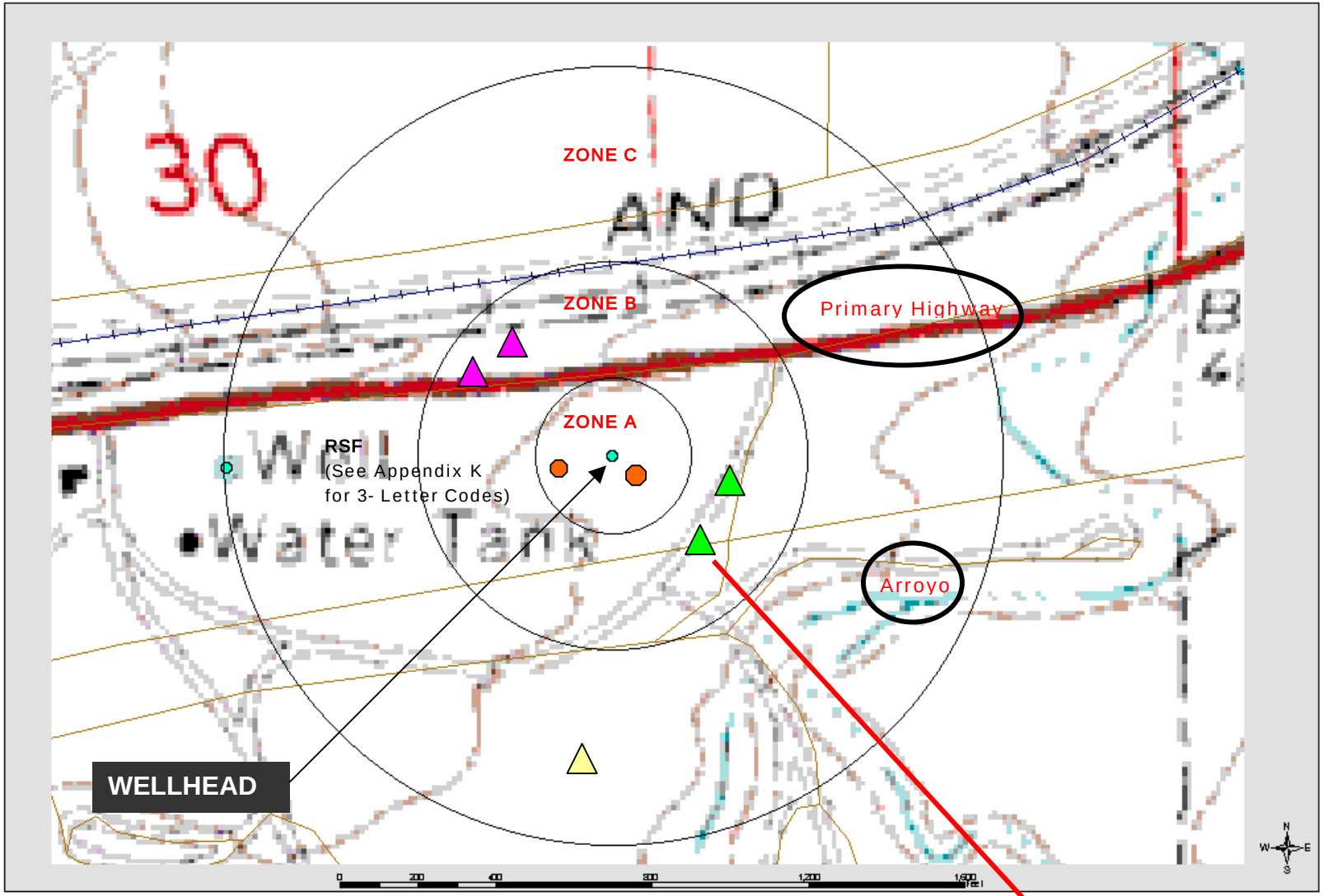


EXAMPLE ONLY

Information depicted characterizes data available from multiple sources, including current Sanitary Surveys and state and federal databases. No assertion of the accuracy of the databases is made by NMED-DWB.

Map Legend ***Refer to Appendix C for 3-Letter Source Codes***

- Well Head
- Federal Industrial Permit Facility
- Federal Permit Facility
- Federal Toxic Release Inventory
- Hazardous/Solid Waste Facility
- Impoundment
- Monitoring Well
- NM Impaired Water
- Oil Conservation Well
- Petroleum Storage
- Underground Injection Well
- Railroad
- Roadway

WELL # **3**	WSS # **25332**
Source Type	Ground Water
Susceptibility Analysis Date	**May, 2003**
Susceptibility Analysis Completed by	NMED-DWB
Date of PSOC Inventory	**April, 2002**

SENSITIVITY ANALYSIS

1. Depth of Screened Interval

Screened Interval Depth	Sensitivity Range	Rank Assigned
less than 100 feet	High	
100 - 200 feet	Moderately High	
201 - 500 feet	Moderate	Moderate
501 - 700 feet	Moderately Low	
greater than 700 feet	Low	

2. Well Construction Information and Integrity

A) Information Ranking

Construction Information Available	Points Possible	Points Assigned
Casing diameter, casing length and casing materials	2	2
Location of screened interval(s)	3	3
Total completion depth	3	3
Static water level at completion	2	2
Pump type, size and setting	2	2
Drilling log or equivalent	3	3
Total Points	15	15

Information Points	Sensitivity Range	Rank Assigned
0-3	High	
4-6	Moderately High	
7-9	Moderate	
10-12	Moderately Low	
13-15	Low	Low

B) Integrity Ranking

Physical Integrity of Supply Well	Points Possible	Points Assigned
Is the well located outside of an area susceptible to flooding?	2	2
Does well casing terminate at least 18 inches above floor or ground level?	2	1
Is annular space pressure-grouted to depth of at least 20 feet?	3	0
Is the wellhead properly sealed?	3	3
Is there a concrete pad around the wellhead that slopes away from the casing?	1	1
Does the well vent terminate at least 18 inches above floor or ground level, and is the vent screened and oriented to open downward?	1	1
Are check valves, blow-off valves and flow meters properly maintained and operated?	1	1
Is the wellhead fenced, housed or properly protected?	2	2
Total Points	15	11

Integrity Points	Sensitivity Range	Rank Assigned
0-3	High	
4-6	Moderately High	
7-9	Moderate	
10-12	Moderately Low	Moderately Low
13-15	Low	

3. DRASTIC Index = **126**

Depth to Water (ft)	332
Net Recharge (inch/yr (approximated))	0-2
Aquifer Media	Santa Fe Group, Sand & Gravel with layers of Silt & Clay
Soil Media	Blue Point Soil, Loamy Sand
Topography (ground slope) (%)	0-2
Impacts of Vadose Zone Media	Sand & Gravel with significant Silt & Clay
Hydraulic Conductivity (Aquifer) (gpd/ft^2)	112

DRASTIC Index	Sensitivity Range	Sensitivity Rank
201 or greater	High	
171-200	Moderately High	
131-170	Moderate	
101-130	Moderately Low	Moderately Low
0-100	Low	

Composite Sensitivity Ranking for Ground Water Source (Converted, Uniform Scale) for Well
Sensitivity Rank = Well Depth Rank (Screen) + Well Construction/Integrity Rank + DRASTIC Index Rank

Rank for Depth of Screened Interval	
High (25 points)	
Moderately High (20 points)	
Moderate (15 points)	15
Moderately Low (10 points)	
Low (5 point)	
Rank for Well Construction Records	
High (25 points)	
Moderately High (20 points)	
Moderate (15 points)	
Moderately Low (10 points)	
Low (5 point)	5
Rank for Integrity of Construction	
High (25 points)	
Moderately High (20 points)	
Moderate (15 points)	
Moderately Low (10 points)	10
Low (5 point)	
Rank for DRASTIC Index	
High (25 points)	
Moderately High (20 points)	
Moderate (15 points)	
Moderately Low (10 points)	10
Low (5 point)	
Point Sum	40
Rank Assigned (see Ranking Guide, below)	Moderately Low

Sum of Sensitivity Points	Composite Sensitivity Range	Well Composite Rank Assigned
90-100	High	
70-85	Moderately High	
50-65	Moderate	
30-45	Moderately Low	Moderately Low
20-25	Low	

Sensitivity Rank = **MODERATELY LOW**

VULNERABILITY ANALYSIS for Well

PSOC Ranking Determination				
	Zone			Ranking
	Zone A	Zone B	Zone C	
Number of PSOC in Zone	1+	10+	15+	High
	0	8-9	12-14	Moderately High
	0	5-7	8-11	Moderate
	0	3-4	5-7	Moderately Low
	0	0-2	0-4	Low

PSOC Vulnerability Inventory and Ranking				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Appendix K	IUR	A	1+	High
Appendix K	AFI	C	0-4	Low
Appendix K	CAR	C	0-4	Low

Vulnerability Rank = **HIGH**

Susceptibility Ranking						
	Sensitivity Ranking					
Vulnerability Ranking		High	Moderately High	Moderate	Moderately Low	Low
	High	High	High	Moderately High	**Moderately High**	Moderate
	Moderately High	High	Moderately High	Moderately High	Moderate	Moderate
	Moderate	Moderately High	Moderately High	Moderate	Moderate	Moderately Low
	Moderately Low	Moderately High	Moderate	Moderate	Moderately Low	Moderately Low
	Low	Moderate	Moderate	Moderately Low	Moderately Low	Low

WELL # **4**	WSS # **25332**
Source Type	Ground Water
Susceptibility Analysis Date	**May, 2003**
Susceptibility Analysis Completed by	NMED-DWB
Date of PSOC Inventory	**April, 2002**

SENSITIVITY ANALYSIS

1. Depth of Screened Interval

Screened Interval Depth	Sensitivity Range	Rank Assigned
less than 100 feet	High	
100 - 200 feet	Moderately High	
201 - 500 feet	Moderate	Moderate
501 - 700 feet	Moderately Low	
greater than 700 feet	Low	

2. Well Construction Information and Integrity

A) Information Ranking

Construction Information Available	Points Possible	Points Assigned
Casing diameter, casing length and casing materials	2	2
Location of screened interval(s)	3	3
Total completion depth	3	3
Static water level at completion	2	2
Pump type, size and setting	2	2
Drilling log or equivalent	3	3
Total Points	15	15

Information Points	Sensitivity Range	Rank Assigned
0-3	High	
4-6	Moderately High	
7-9	Moderate	
10-12	Moderately Low	
13-15	Low	Low

B) Integrity Ranking

Physical Integrity of Supply Well	Points Possible	Points Assigned
Is the well located outside of an area susceptible to flooding?	2	2
Does well casing terminate at least 18 inches above floor or ground level?	2	2
Is annular space pressure-grouted to depth of at least 20 feet?	3	3
Is the wellhead properly sealed?	3	3
Is there a concrete pad around the wellhead that slopes away from the casing?	1	1
Does the well vent terminate at least 18 inches above floor or ground level, and is the vent screened and oriented to open downward?	1	1
Are check valves, blow-off valves and flow meters properly maintained and operated?	1	1
Is the wellhead fenced, housed or properly protected?	2	2
Total Points	15	15

Integrity Points	Sensitivity Range	Rank Assigned
0-3	High	
4-6	Moderately High	
7-9	Moderate	
10-12	Moderately Low	Moderately Low
13-15	Low	

3. DRASTIC Index = **126**

Depth to Water (ft)	279
Net Recharge (inch/yr (approximated))	0-2
Aquifer Media	Santa Fe Group, Sand & Gravel with layers of Silt & Clay
Soil Media	Blue Point Soil, Loamy Sand
Topography (ground slope) (%)	0-2
Impacts of Vadose Zone Media	Sand & Gravel with significant Silt & Clay
Hydraulic Conductivity (Aquifer) (gpd/ft^2)	112

DRASTIC Index	Sensitivity Range	Sensitivity Rank
201 or greater	High	
171-200	Moderately High	
131-170	Moderate	
101-130	Moderately Low	Moderately Low
0-100	Low	

Composite Sensitivity Ranking for Ground Water Source (Converted, Uniform Scale) for Well
Sensitivity Rank = Well Depth Rank (Screen) + Well Construction/Integrity Rank + DRASTIC Index Rank

Rank for Depth of Screened Interval	
High (25 points)	
Moderately High (20 points)	
Moderate (15 points)	15
Moderately Low (10 points)	
Low (5 point)	
Rank for Well Construction Records	
High (25 points)	
Moderately High (20 points)	
Moderate (15 points)	
Moderately Low (10 points)	
Low (5 point)	5
Rank for Integrity of Construction	
High (25 points)	
Moderately High (20 points)	
Moderate (15 points)	
Moderately Low (10 points)	
Low (5 point)	5
Rank for DRASTIC Index	
High (25 points)	
Moderately High (20 points)	
Moderate (15 points)	
Moderately Low (10 points)	10
Low (5 point)	
Point Sum	35
Rank Assigned (see Ranking Guide, below)	Moderately Low

Sum of Sensitivity Points	Composite Sensitivity Range	Well Composite Rank Assigned
90-100	High	
70-85	Moderately High	
50-65	Moderate	
30-45	Moderately Low	Moderately Low
20-25	Low	

Sensitivity Rank = **MODERATELY LOW**

VULNERABILITY ANALYSIS for Well

PSOC Ranking Determination				
	Zone			Ranking
	Zone A	Zone B	Zone C	
Number of PSOC in Zone	1+	10+	15+	High
	0	8-9	12-14	Moderately High
	0	5-7	8-11	Moderate
	0	3-4	5-7	Moderately Low
	0	0-2	0-4	Low

PSOC Vulnerability Inventory and Ranking				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Appendix K	AFI	C	0-4	Low
Appendix K	IUR	C	0-4	Low

Vulnerability Rank = **LOW**

Susceptibility Ranking						
	Sensitivity Ranking					
Vulnerability Ranking		High	Moderately High	Moderate	Moderately Low	Low
	High	High	High	Moderately High	Moderately High	Moderate
	Moderately High	High	Moderately High	Moderately High	Moderate	Moderate
	Moderate	Moderately High	Moderately High	Moderate	Moderate	Moderately Low
	Moderately Low	Moderately High	Moderate	Moderate	Moderately Low	Moderately Low
	Low	Moderate	Moderate	Moderately Low	**Moderately Low**	Low

WELL # **5**	WSS # **25332**
Source Type	Ground Water
Susceptibility Analysis Date	**May, 2003**
Susceptibility Analysis Completed by	NMED-DWB
Date of PSOC Inventory	**April, 2002**

SENSITIVITY ANALYSIS

1. Depth of Screened Interval

Screened Interval Depth	Sensitivity Range	Rank Assigned
less than 100 feet	High	
100 - 200 feet	Moderately High	
201 - 500 feet	Moderate	Moderate
501 - 700 feet	Moderately Low	
greater than 700 feet	Low	

2. Well Construction Information and Integrity

A) Information Ranking

Construction Information Available	Points Possible	Points Assigned
Casing diameter, casing length and casing materials	2	2
Location of screened interval(s)	3	3
Total completion depth	3	3
Static water level at completion	2	2
Pump type, size and setting	2	2
Drilling log or equivalent	3	3
Total Points	15	15

Information Points	Sensitivity Range	Rank Assigned
0-3	High	
4-6	Moderately High	
7-9	Moderate	
10-12	Moderately Low	
13-15	Low	Low

B) Integrity Ranking

Physical Integrity of Supply Well	Points Possible	Points Assigned
Is the well located outside of an area susceptible to flooding?	2	2
Does well casing terminate at least 18 inches above floor or ground level?	2	2
Is annular space pressure-grouted to depth of at least 20 feet?	3	3
Is the wellhead properly sealed?	3	3
Is there a concrete pad around the wellhead that slopes away from the casing?	1	1
Does the well vent terminate at least 18 inches above floor or ground level, and is the vent screened and oriented to open downward?	1	1
Are check valves, blow-off valves and flow meters properly maintained and operated?	1	1
Is the wellhead fenced, housed or properly protected?	2	2
Total Points	15	15

Integrity Points	Sensitivity Range	Rank Assigned
0-3	High	
4-6	Moderately High	
7-9	Moderate	
10-12	Moderately Low	Moderately Low
13-15	Low	

3. DRASTIC Index = **95**

Depth to Water (ft)	360
Net Recharge (inch/yr (approximated))	0-2
Aquifer Media	Santa Fe Group, Sand & Gravel with layers of Silt & Clay
Soil Media	Blue Point Soil, Loamy Sand
Topography (ground slope) (%)	0-2
Impacts of Vadose Zone Media	Sand & Gravel with significant Silt & Clay
Hydraulic Conductivity (Aquifer) (gpd/ft^2)	12

DRASTIC Index	Sensitivity Range	Sensitivity Rank
201 or greater	High	
171-200	Moderately High	
131-170	Moderate	
101-130	Moderately Low	
0-100	Low	Low

Composite Sensitivity Ranking for Ground Water Source (Converted, Uniform Scale) for Well
Sensitivity Rank = Well Depth Rank (Screen) + Well Construction/Integrity Rank + DRASTIC Index Rank

Rank for Depth of Screened Interval	
High (25 points)	
Moderately High (20 points)	
Moderate (15 points)	15
Moderately Low (10 points)	
Low (5 point)	
Rank for Well Construction Records	
High (25 points)	
Moderately High (20 points)	
Moderate (15 points)	
Moderately Low (10 points)	
Low (5 point)	5
Rank for Integrity of Construction	
High (25 points)	
Moderately High (20 points)	
Moderate (15 points)	
Moderately Low (10 points)	
Low (5 point)	5
Rank for DRASTIC Index	
High (25 points)	
Moderately High (20 points)	
Moderate (15 points)	
Moderately Low (10 points)	
Low (5 point)	5
Point Sum	30
Rank Assigned (see Ranking Guide, below)	Moderately Low

Sum of Sensitivity Points	Composite Sensitivity Range	Well Composite Rank Assigned
90-100	High	
70-85	Moderately High	
50-65	Moderate	
30-45	Moderately Low	Moderately Low
20-25	Low	

Sensitivity Rank = **MODERATELY LOW**

VULNERABILITY ANALYSIS for Well

PSOC Ranking Determination				
	Zone			Ranking
	Zone A	Zone B	Zone C	
Number of PSOC in Zone	1+	10+	15+	High
	0	8-9	12-14	Moderately High
	0	5-7	8-11	Moderate
	0	3-4	5-7	Moderately Low
	0	0-2	0-4	Low

PSOC Vulnerability Inventory and Ranking				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Appendix K	MSL	A	1+	High
Appendix K	CSS	B	0-2	Low
Appendix K	IUR	B	0-2	Low
Appendix K	MSL	B	0-2	Low
Base Map	Arroyo	C	0-4	Low
Appendix K	CFB	C	0-4	Low
Appendix K	CSS	C	0-4	Low
Appendix K	IUR	C	0-4	Low

Vulnerability Rank = **HIGH**

Susceptibility Ranking						
	Sensitivity Ranking					
Vulnerability Ranking		High	Moderately High	Moderate	Moderately Low	Low
	High	High	High	Moderately High	**Moderately High**	Moderate
	Moderately High	High	Moderately High	Moderately High	Moderate	Moderate
	Moderate	Moderately High	Moderately High	Moderate	Moderate	Moderately Low
	Moderately Low	Moderately High	Moderate	Moderate	Moderately Low	Moderately Low
	Low	Moderate	Moderate	Moderately Low	Moderately Low	Low

The Inventory of Actual and Potential Sources of Contamination was completed by NMED-DWB and is incorporated in Appendix J at Step 3, Number 9.

INVENTORY OF ACTUAL AND POTENTIAL SOURCES OF CONTAMINATION				
Description of Contaminant	Actual Contamination	Potential Contamination	Distance from Wellhead and/or Zone of Influence	Number of Sources of Contamination (may be expressed by a range i.e., 2-4).
Monitoring Well	No	Yes	Zone A	1+
Hazardous/Solid Waste Generator	No	Yes	Zone B	2-4
Petroleum Storage	No	Yes	Zone B	2-4
Primary Highway	No	Yes	Zone B	2-4
Railroad	No	Yes	Zone B	2-4
Single family Residences – Unsewered	No	Yes	Zone B	2-4
Abandoned Well	No	Yes	Zone C	3-4
Arroyo	No	Yes	Zone C	3-4
Federal Toxic Release Inventory Site	No	Yes	Zone C	3-4
Railroad	No	Yes	Zone C	3-4
Secondary Highway	No	Yes	Zone C	3-4

Adoption of management strategies for specific contaminate sources should be based on a thorough review of the exiting management types. For instance, when considering management of storm water runoff, [12] management methods range from non-structural methods (sewer stenciling, good housekeeping, education,) to engineered devices (buffer and filter strips, infiltration, BMPs) and for municipal systems compliance with U.S. EPA's *National Pollutant Discharge Elimination System (NPDES) Permitting Program* is a regulatory requirement.

MANAGEMENT STRATEGY AND SCHEDULE (EXAMPLE)

Management Measure/Tool	Management Strategy	Assigned to /Implemented by	Time Line	Update Schedule and Planned Date
Wellhead Protection Ordinance	Identify the wellhead protection area, draft a source water protection ordinance (see example, Appendix G), identify the entity responsible for hearing ordinances, gain citizen support, and petition for adoption of ordinance.	Mr. XYZ and Ms. ABC	July 2003	Not Applicable
Wellhead Protection Sign Posting	Identify the source water delineation area; identify how many signs will be needed and where they may be purchased, the costs and budget considerations, and guidelines and/or laws for posting the signs. Post the signs.	Mr. XYZ and Ms. ABC	August 2003	Every 10 years (August 2013)
Adopt a Zoning Ordinance	Research zoning ordinances. Identify any existing zoning ordinances, and procedures necessary for adoption. Talk with city planners and landowners, gain public support, and petition to adopt the zoning ordinance.	Mr. XYZ Attorney, and Ms. ABC City Planning	September 2003	Not Applicable
Well Abandonment Procedures	Determine if an additional water source is necessary. Check local and state guidelines and regulations for proper well abandonment procedures, properly abandon the well, and report well abandonment to NMED-Drinking Water Bureau.	Ms. Hydrologist	July 2003	Not Applicable
Strom Water Drain Protection	Contact the city-planning department and inquire about storm water drains. Check local and state guidelines and regulations for requirements, and research storm water protection measures/tools.	Mr. Hydrologist	July 2003	Bi-Yearly (July 2005)

[12] *Storm water runoff* is rain or snowmelt flowing from rooftops and other structures, pavement on roads, sidewalks, and parking lots, and degraded land covers such as dirt parking lots, walking paths, baseball fields and suburban lawns, and areas of insufficient land cover such as vegetation.

Your Water Utilities *Contingency Protocol and Schedule* should include the first three categories in Column 1 of the table below, in addition to categories you may wish to include.

CONTINGENCY PROTOCOL **AND SCHEDULE (EXAMPLE)**						
Contingency Planning Categories	**Protocol Elements**	**Current Issue**	**Future Issue**	**Assigned to - Implemented by**	**Time Line**	**Update Schedule and Planned Update**
Emergency Water Outage	Develop a protocol: list all potential types of water outages, identify responsible agencies/parties, and provide contact information. Estimate how much water per day will be needed by your customers, and budget for this potential expense.	No	Yes	Ms. ABC	July 2003	Quarterly September 2003, November 2003, etc.
Accidental Leak or Spill Near or Into Water Source	Develop a protocol: list all potential types of leaks and spills, identify responsible agencies/parties, and provide contact information.	Yes	Yes	Mr. XYZ and Ms. ABC	August 2003	Yearly August 2004
Water Conservation	Develop a Water Conservation Plan: research the status of your aquifer, identify existing conservation methods, and promote the plan.	Yes	Yes	Ms. DEF	August 2003	Bi-Yearly August 2005
Land Acquisition for New Water Source	Develop a Land Acquisition Strategy: Identify when the source will be needed, where potential new water sources exist, and research land acquisition methods such as ownership, lease, and/or easements. Identify and discuss future zoning issues surrounding the new source site, and prepare a budget for the costs of acquiring the new source.	No	Possibly	Mr. XYZ Attorney, and Ms. ABC Public Works Director	September 2003	Yearly September 2004

Shown below are two examples of Media Aids developed by the International City/County Management Association to promote source water protection, and which may be used as part of your Source Water Protection Plan. Other forms of media aids include posters, fact sheets, informational flyers, brochures, and resources lists.

For Immediate Release: Contact: [*Name*]
[*Date*] [*Phone #*]

Protect Your Drinking Water… Protect the Source!

[*City*],[*State*]—Have you ever thought about where your drinking water comes from, beyond the faucet? Did you know that what you do in and around your home can affect not only the quality of your water but also the quality of your neighbor's water? Find out where your drinking water really comes from and learn about how you can help protect it during a [*Duration of campaign*]-month-long drinking water source awareness campaign, starting [*Start date*], sponsored by [*Name of sponsor*]. The campaign will provide information on

- The source of your local drinking water
- The value of safe drinking water
- Potential threats to your local drinking water
- Steps you can take to protect your drinking water
- Contact information for additional resources on drinking water protection.

Safe drinking water is essential to a community's quality of life and continued economic growth. Yet citizens may not always be aware of safe drinking water issues in their community and may not realize what needs to be done to protect drinking water and keep it safe for their families and businesses. Drinking water wells across the country are being contaminated daily by common activities, such as pouring motor oil and household chemicals down drains, using too much pesticides and fertilizers, and littering streets with refuse that will eventually run off into rivers and streams. When water supplies are not safe, the health of the community — especially of the young, the old, and the sick — is jeopardized. In addition, communities may experience a loss of tax revenues from real estate and new jobs as businesses refuse to locate to or remain in communities with known or suspected water contamination problems. Protecting drinking water sources is the first line of defense in ensuring safe drinking water. If communities are aware of their drinking water sources and of potential threats to these sources, they can take steps to keep the sources safe and improve their local environment. There is something everyone — from retirees to school kids to individuals in their homes — can do to help. To find out what you can do, contact [*Contact name and phone number*].

[*Acknowledgment*]

Hi, my name is (Name) with a few words on protecting your drinking water.

Consider where your drinking water comes from.

Get to know the source of your drinking water, and get involved in activities to protect it. Drinking water source protection is a low-cost means to preserving the safety of a vital resource. Here are a few simple things you can do to help keep pollution out of the river, lake, stream, or aquifer that is your drinking water source:

- Take used motor oil to a recycling center. If you let it drain into a storm sewer or bury it in the trash, it can leak into lakes, rivers, and wells. Just one pint of used motor oil can expand over great distances, and potentially harm human health and the environment.
- Properly dispose of toxic household trash. For example, batteries contain lead and mercury. Some household cleaners also contain substances that contaminate water. Many communities have special collection sites for these items.
- Do not dispose of chemicals such as paints, cleaning products, and pesticides into septic systems, dry wells, stormwater drainage wells, or other shallow disposal systems that discharge to groundwater.
- Properly install and maintain septic systems. Be sure to inspect them regularly and pump them out when necessary.
- Find out what your community is doing to protect your water source and get involved. Work with schools, civic groups, and others to start a protection program. Safe drinking water is everyone's responsibility.

For more information, contact (Name) and (Contact information) Together, we can make a difference. This is a public service announcement brought to you by (Name of sponsoring organization).

Examples of Categories of Management Measures & Tools Used for Source Water Protection Planning

PUBLIC EDUCATION
- Newspaper Articles
- Radio
- Pamphlets
- Brochures
- Community Meetings
- Seminars –Slide Shows and Video
- Storm Drain Stencil Program

BEST MANAGEMENT PRACTICES
- Agricultural

Tillage Practices / Erosion Control Measures
Range & Pasture Management

- Forestry

Forest Revegetation
Logging & Road Construction Management
Streamside Area Management

- Urban

Buffer Zones / Setbacks
Primary & Secondary Containment
Storm Drain Maintenance

- Waterbody

River/Reservoir Management Program(s)
Shoreline Restoration

ZONING (Regulatory)
- Overlay/Protection District
- Prohibition of Various Land Use
- Special Permitting
- Large-Lot Zoning
- Transfer of Development Rights
- Growth Control
- Performance Standards

HEALTH REQUIREMENTS (Regulatory)
- Privately Owned Wastewater Treatment Plant
- Septic Cleaner Ban
- Septic System Upgrade
- Toxic & Hazardous Materials Handling Requirements
- Private Well Protection

LAND TRANSFER (Non-Regulatory/ Voluntary)
- Sale/Donation
- Conservation Easement
- Limited Development

LEGISLATIVE (Regulatory)
- Regional Source Water Protection Districts
- Land Banking

POINT SOURCE POLLUTION RESTRICTIONS
- Waste Processing Plants

LAND ACQUISITION (Non-Regulatory & Regulatory)

OTHER (Non-Regulatory)
- Increased Monitoring
- Hazardous Waste Collection

A Variety of Resources are Available

Wellhead Protection Signs

Water Sourcebooks Contain 324 Activities for Grades K-12

U.S. EPA STORM DRAIN STENCILING PROGRAMS

Planning tools such as ordinances, zoning decisions, regulations, and descriptions of BMP used to support your Source Water Protection Plan should be attached *(the Ordinance shown below is an example based on a Wellhead Protection Ordinance adopted by the City of Wilber, Saline County, Nebraska).*

ORDINANCE NO. __

AN ORDINANCE FOR THE CITY OF (NAME), (NAME) COUNTY, (NAME OF STATE) TO CREATE SECTION XXX OF THE MUNICIPAL CODE OF THE CITY OF (NAME), BY ADDING A NEW SECTION TO DESIGNATE A WELLHEAD PROTECTION AREA.

BE IT ORDAINED BY THE MAYOR AND COUNCIL OF THE CITY OF (NAME), STATE OF (NAME), as follows:

Section 1. Definition. Source Water Protection Area means the surface and subsurface area surrounding a water well or well field supplying a public water system through which contaminants are reasonably likely to move toward and reach such water or well field.

Section 2. The City of (Name) designates a Wellhead Protection Area for the purpose of protection of the public water supply system. The boundaries of the source Water Protection Area are delineated based upon a map prepared by the (Name) presented to the City of (Name) on (Date), which is on file at the office of the (Name) City/County Clerk, and is available for public inspection.

Section 3. Any other Ordinance or section passed and approved prior to the passage, approval, and publication of this Ordinance and in conflict herewith, is hereby repealed.

Section 4. This Ordinance shall take effect and be in full force from and after its passage, approval, and publication as required by law.

PASSED AND APPROVED THIS (Date)

_____
Mayor

ATTEST:

_____
City Clerk

(SEAL)

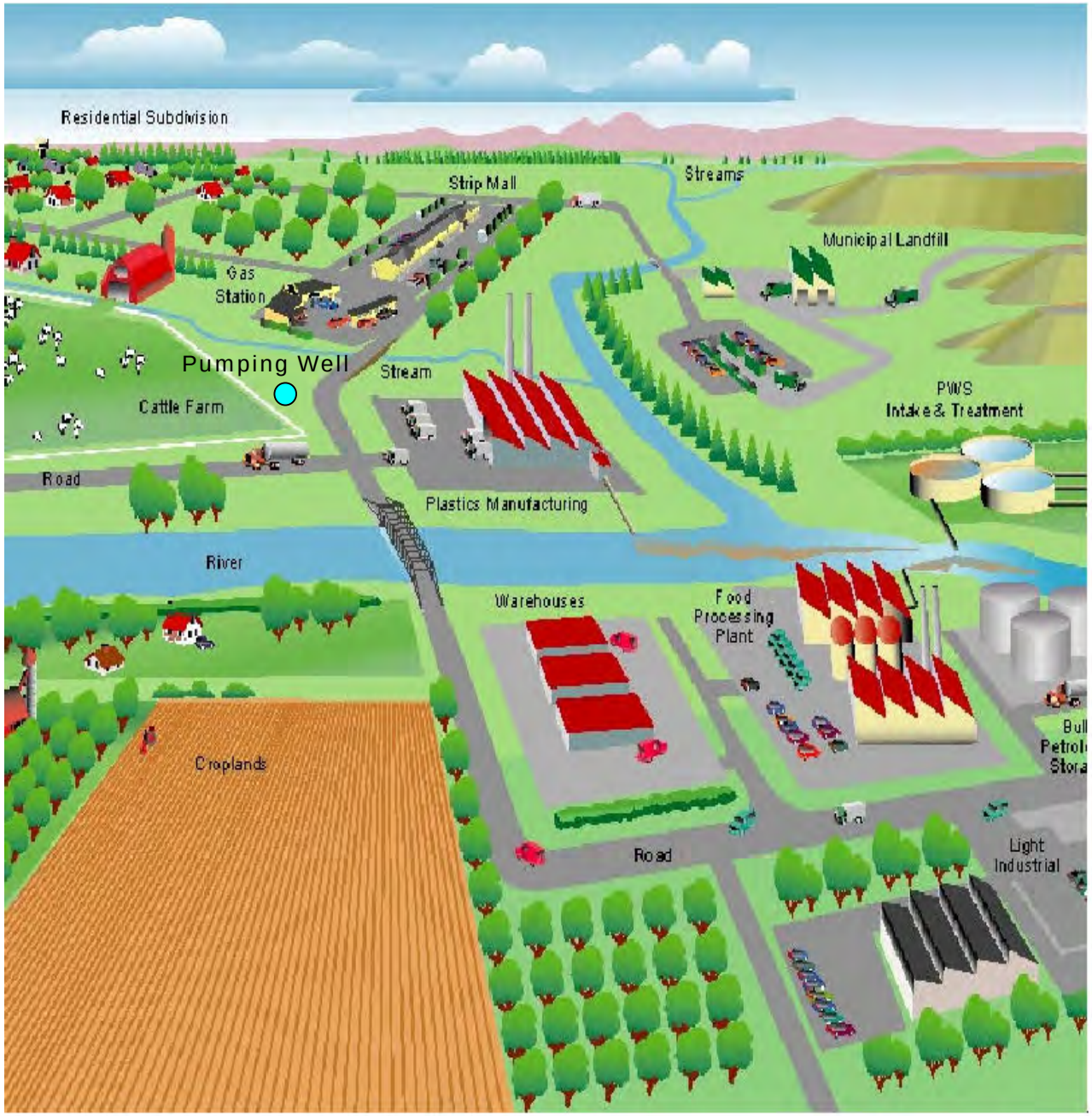
By completing the following exercise many of the tasks and goals of the source water protection planning team (team) should become more apparent.

For the exercise imagine that, as the "Pumping Well (center/ left in the graphic) pumps, contaminants are pulled toward the wellhead and eventually may enter the drinking water system. The team should complete the following: 1) Delineate the source water area as it may extend outward from the wellhead, 2) Identify actual (these are not pictured in the illustration) and potential sources of contamination and their potential impacts to your source water, 3) Identify management measures/tools that may be implemented to protect the water source, 4) Identify potential barriers (physical /economic /political) to implementing the measures, and 5) Identify solutions to the potential barriers.

[As an example, imagine the following: The Plastic Manufacturing Plant (plant) is within 1,00 feet of the pumping well. Although no actual contaminants have been detected in your utilities drinking water samples, potential contaminants from the plant include solvents, oils, organic/inorganic chemicals, acids, and bases, which are considered significant sources of contamination. The plant may or may not be adequately designed to prevent releases of theses chemicals into the environment/groundwater.

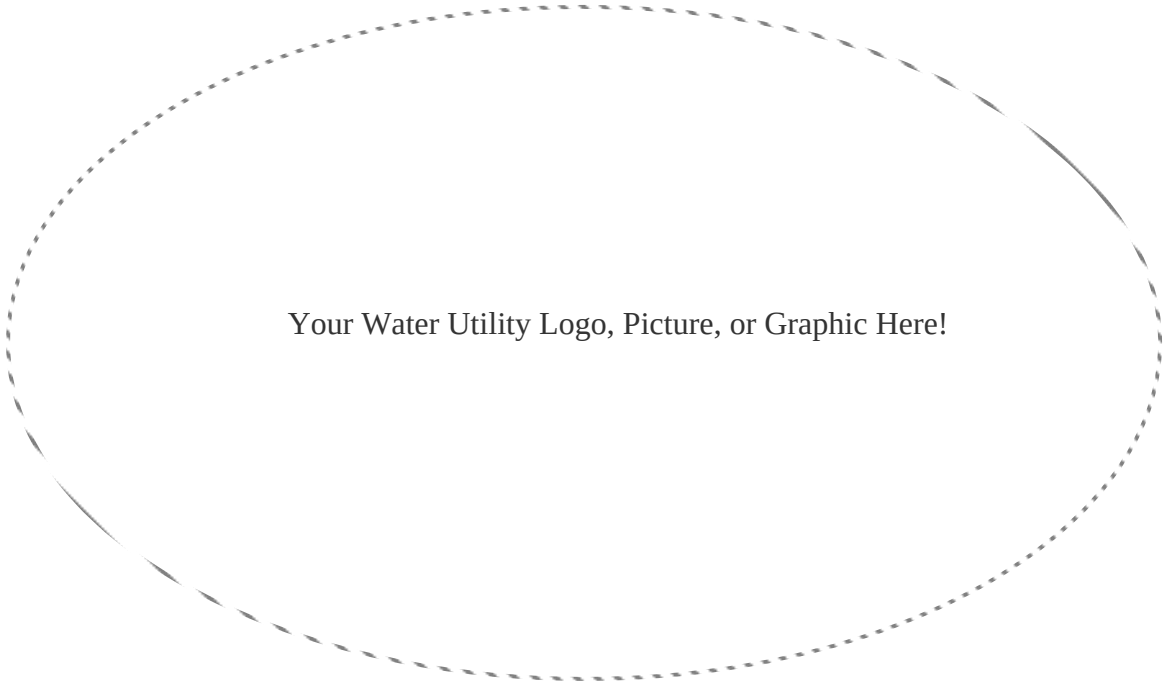
The team might begin by 1) notifying officials at the plant that the plant is located within a planned source water protection area, 2) Make arrangements with the officials to gather information, discuss concerns, 3) Seek information regarding potential protection measures, and 4) Develop management measures (i.e., BMPs) that may help prevent potential releases. The team should work with the plant officials to document any management measures implemented, select a time for updating the measure(s), properly inform the public of the **proactive** protective measure taken by the plant (any responses from the public should be reviewed and considered), enter the management measure in the Source Water Protection Plan].

Source Water Protection Planning Exercise



This Protection Plan Template lists the necessary elements of a Source Water Protection plan. You may complete this template and return it to NMED-DWB or create a template of your own design.

Source Water Protection Plan of the
Los Lunas Water System Water Utility
Public Water System # 25332
Date:



Prepared by
Los Lunas Water System Water Utility &
The New Mexico Environment Department Drinking Water Bureau
Funded under the Federal Safe Drinking Water Amendments of 1996

The Los Lunas Water System Water Utility
Address
Utility Administrator and Operator Contact Information
Number of Water Supply Sources (#)
Current Date
Scheduled Update by (Date)

On (Date) a *Source Water Assessment and Protection Plan* (SWAPP) was adopted by the Los Lunas Water System water utility. The SWAPP complies with the requirements for source water protection defined under the *Safe Drinking Water Act Amendments of 1996*. The Los Lunas Water System water utility has received special recognition for its contribution toward preventing adverse effects to human health and the environment, and for protection of the environmental integrity of the State of New Mexico's ground water resources (Certificate/Letter of Commendation will be attached once the SWAPP is finalized).

SOURCE WATER PROTECTION PLAN OF THE **LOS LUNAS WATER SYSTEM** WATER UTILITY

(The following information is required for NMED-DWB to approve your protection plan. Once a draft protection plan is prepared, and before public review, your utility must submit the plan to NMED-DWB for review and approval)[13]

STEP 1

1) List the names of the Community Planning team.

2) List the name(s) and provide signature(s) of the governing entity.

3) Describe the public's involvement/participation in the development and implementation of the Source Water Protection Plan. Attach copies of all relevant public notice(s).

4) Describe how the public will continue to participate in and/or be informed of Source Water Protection Plan issues (one example is to petition to have your Source Water Protection Plan on a weekly or monthly agenda, such as your town or city council meeting).

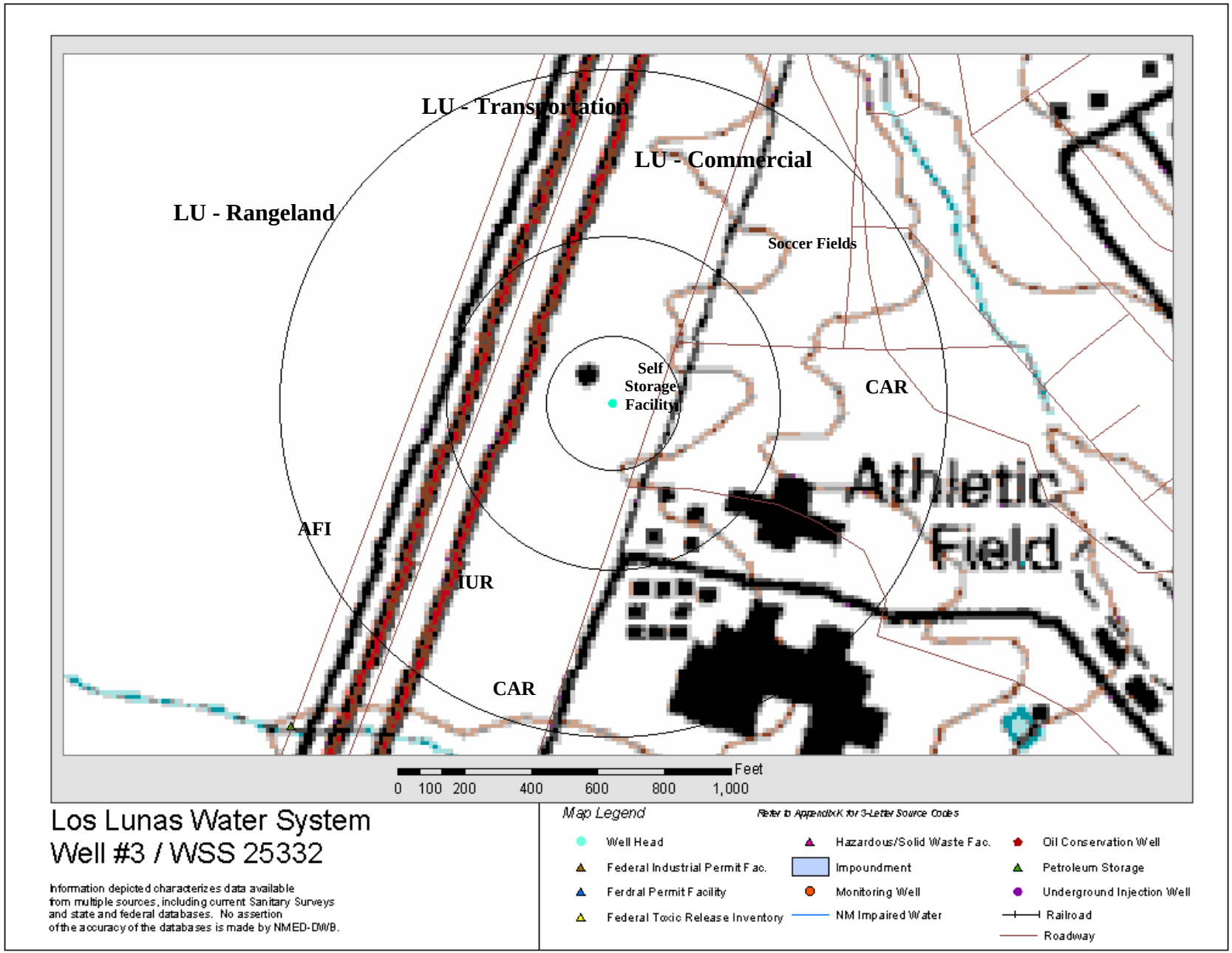
STEP 2

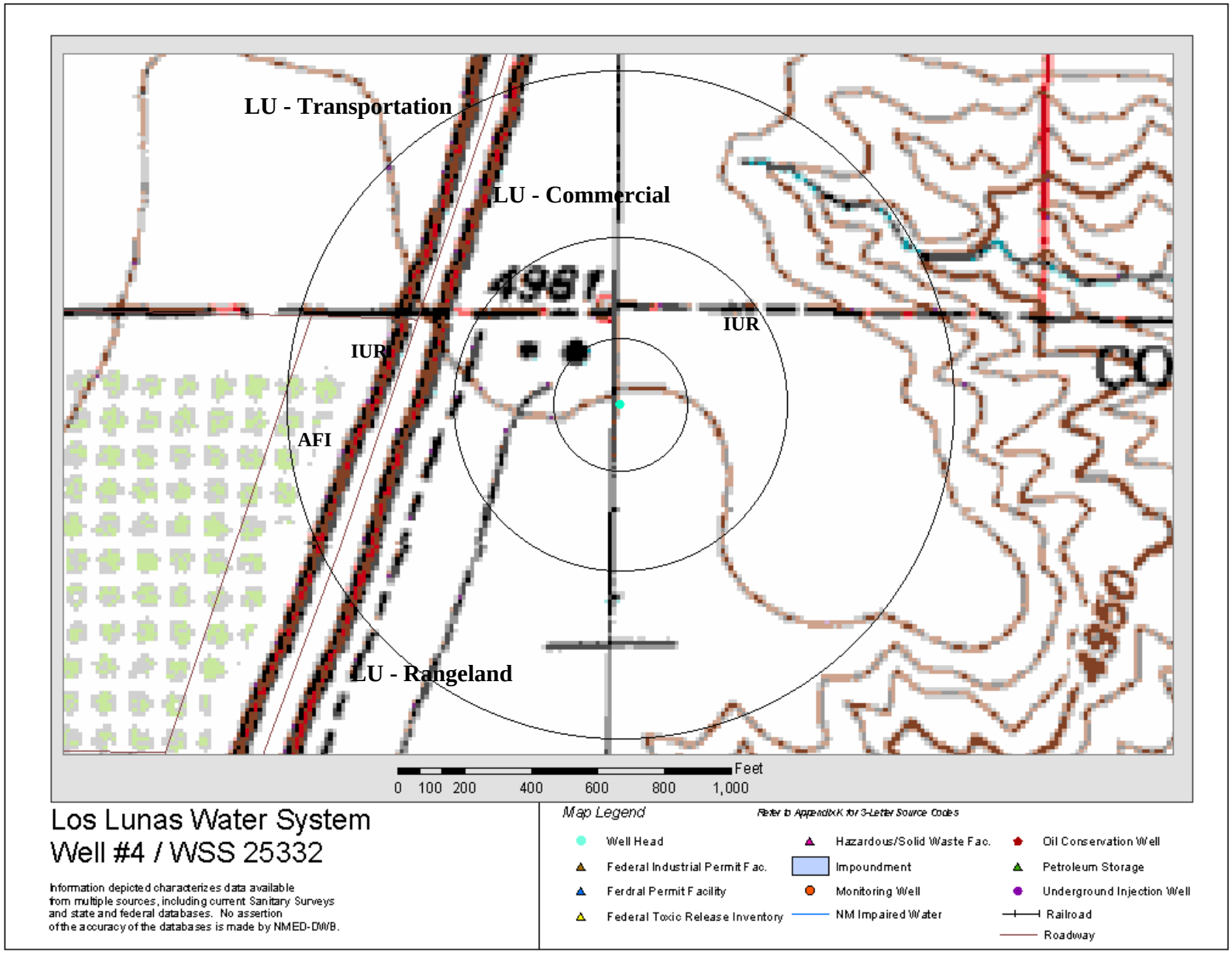
5) Describe the water supply system.

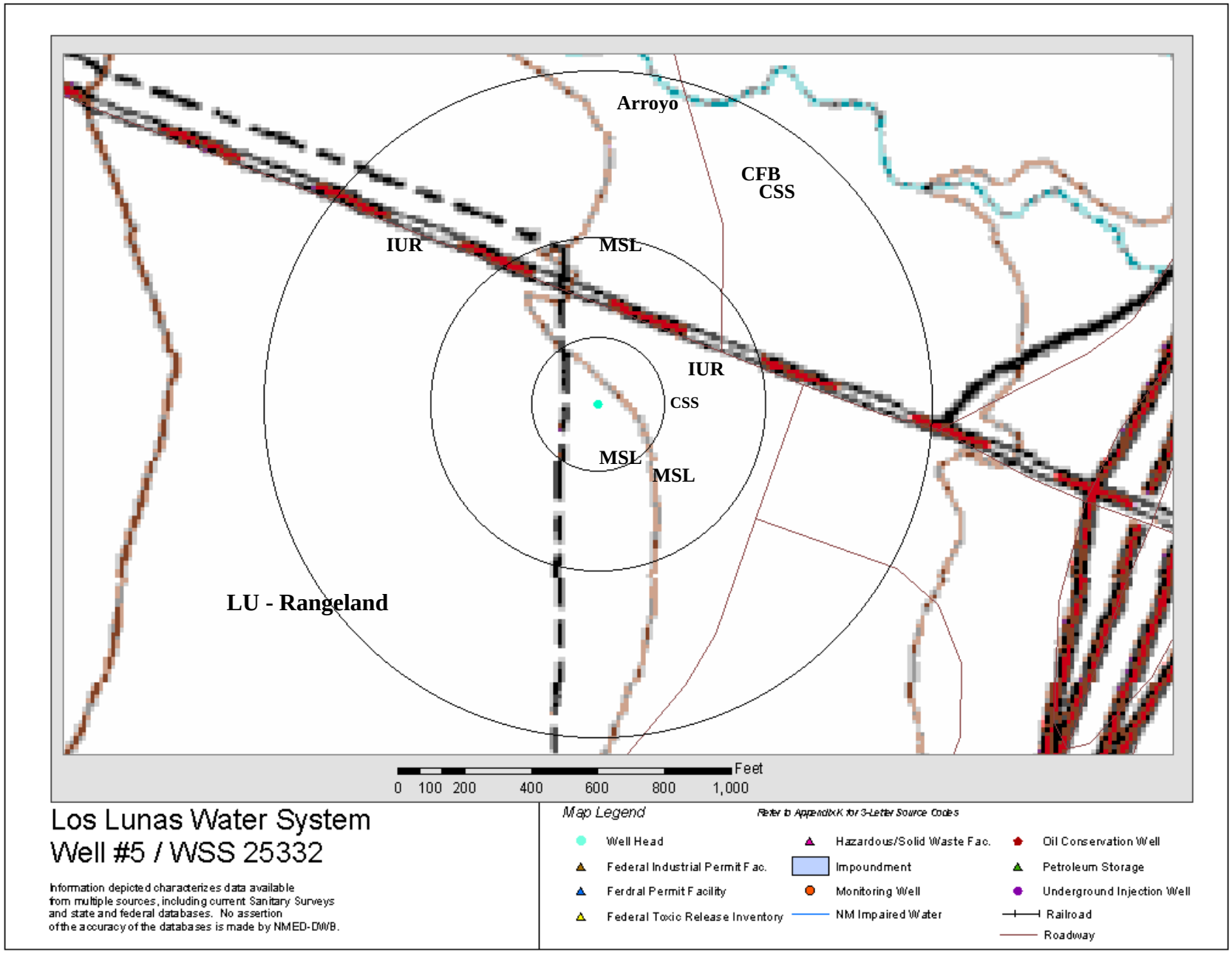
6) Describe the hydrogeology of the area.

7) Describe how the source water protection area(s) were determined (your answer may include topographic maps, ArcView Geographical Information Systems, Wellhead Analytical Element Model, Modflow, *etc*). Attach a copy of all source water maps (see example, Appendix A). ***NMED-DWB has inserted the Source Area Delineation Maps for your water utility. You may use these maps to satisfy this required element, or develop your own approach.***

[13] Please allow 45 days for the NMED-DWB approval process, once you have completed and submitted a SWAPP for review.


LU - Transportation
LU - Commercial
LU - Rangeland
Soccer Fields
Self Storage Facility
CAR
Athletic Field
AFI
IUR
CAR
Feet
0 100 200 400 600 800 1,000
Los Lunas Water System
Well #3 / WSS 25332
Information depicted characterizes data available from multiple sources, including current Sanitary Surveys and state and federal databases. No assertion of the accuracy of the databases is made by NMED-DWB.
Map Legend
Refer to Appendix K for 3-Letter Source Codes
Well Head
Federal Industrial Permit Fac.
Ferdral Permit Facility
Federal Toxic Release Inventory
Hazardous/Solid Waste Fac.
Impoundment
Monitoring Well
NM Impaired Water
Oil Conservation Well
Petroleum Storage
Underground Injection Well
Railroad
Roadway


LU - Transportation
LU - Commercial
IUR
IUR
AFI
LU - Rangeland
Feet
0 100 200 400 600 800 1,000
Los Lunas Water System
Well #4 / WSS 25332
Information depicted characterizes data available from multiple sources, including current Sanitary Surveys and state and federal databases. No assertion of the accuracy of the databases is made by NMED-DWB.
Map Legend
Refer to Appendix K for 3-Letter Source Codes
Well Head
Federal Industrial Permit Fac.
Ferdral Permit Facility
Federal Toxic Release Inventory
Hazardous/Solid Waste Fac.
Impoundment
Monitoring Well
NM Impaired Water
Oil Conservation Well
Petroleum Storage
Underground Injection Well
Railroad
Roadway


Arroyo
CFB
CSS
IUR
MSL
IUR
CSS
MSL
MSL
LU - Rangeland
Feet
0 100 200 400 600 800 1,000
Los Lunas Water System
Well #5 / WSS 25332
Information depicted characterizes data available from multiple sources, including current Sanitary Surveys and state and federal databases. No assertion of the accuracy of the databases is made by NMED-DWB.
Map Legend
Refer to Appendix K for 3-Letter Source Codes
Well Head
Federal Industrial Permit Fac.
Ferdral Permit Facility
Federal Toxic Release Inventory
Hazardous/Solid Waste Fac.
Impoundment
Monitoring Well
NM Impaired Water
Oil Conservation Well
Petroleum Storage
Underground Injection Well
Railroad
Roadway

8) Show and/or describe any potential changes to the source water protection area that might be considered. For instance, one might extend a boundary determined in the initial delineation in order to incorporate a particular parcel of land or existing or planned zoning area.

STEP 3

9) List the actual and potential sources of contamination identified during the inventory, identify the distances and/or zones of influence where they are located, and provide the date(s) the inventory was conducted (see example, Appendix B). ***NMED-DWB has inserted the Inventory of Actual and Potential Sources of Contamination for your water utility. You may use this inventory to satisfy this required element, or you may wish to customize the inventory.***

Well #3

PSOC Vulnerability Inventory and Ranking				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Appendix K	IUR	A	1+	High
Appendix K	AFI	C	0-4	Low
Appendix K	CAR	C	0-4	Low

Well #4

PSOC Vulnerability Inventory and Ranking				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Appendix K	AFI	C	0-4	Low
Appendix K	IUR	C	0-4	Low

Well #5

PSOC Vulnerability Inventory and Ranking				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Appendix K	MSL	A	1+	High
Appendix K	CSS	B	0-2	Low
Appendix K	IUR	B	0-2	Low
Appendix K	MSL	B	0-2	Low
Base Map	Arroyo	C	0-4	Low
Appendix K	CFB	C	0-4	Low
Appendix K	CSS	C	0-4	Low
Appendix K	IUR	C	0-4	Low

STEP 4

10) NMED-DWB has inserted a susceptibility analysis of your water utility, according to the U.S. EPA approved susceptibility guidelines under SWAPP, 2000.

Table 8	**SOURCE SUSCEPTIBILITY RANKING**				
SOURCE NAME	**Sensitivity Rank**	**Vulnerability Rank**	**Susceptibility Rank**	**Operational Exceptions**	**Final Rank**
WELL # 3	Moderately Low	High	Moderately High	LU – Rangeland LU – Transportation LU – Commercial	High
WELL # 4	Low	High	Moderately Low	LU – Rangeland	Moderate
WELL # 5	Moderately Low	High	Moderately High	LU – Rangeland LU – Transportation LU – Commercial >= 3 PSOC Categories / Zone	High

STEP 5

11) List the existing and proposed land use of the delineated source area(s) such as recreation, agriculture, forestry, commercial, and residential. If applicable, this should include current and proposed zoning.

12) Provide a management strategy (measures/tools) and schedule for ***each*** actual and/or potential contaminate (noted in the *Inventory of Actual and Potential Sources of Contamination). Although there may be a time-delay in the implementing specific management strategies, priority should be given to water sources identified as having the greatest s*usceptibility to contamination. **Your water utility is not required to develop a susceptibility analysis, and, NMED-DWB has completed and inserted an analysis for purposes of prioritizing protection planning, refer to Step 4, # 10).**

    In addition, state if, when, and how the management strategies will be updated (see example, Appendix D).

STEP 6

13) Develop a *contingency protocol and schedule* that addresses potential future events that may adversely impact your water supply system such as water outages, accidental leaks and/or spills, water conservation, and land acquisition for new sources of water supply. You should include when and how the plan will be updated (see example, Appendix E).

Map Code	Land Use	Description	Contaminants of Concern*
AGRICULTURAL LAND USE			
AAP	Animal Processing or Rendering Plants	Commercial Operations/Waste Storage/Disposal Facility	Nitrates, Pathogens, Organic/Inorganic Chemicals
ACS	Farm/Ranch Agrochemical Storage Facilities or Sites	Farm/Ranch Storage Site	Pesticides, Herbicides, Fertilizers
ADC	Drainage Canals, Ditches or Acequias-Unlined, Wells (Private, Stock wells, and Irrigation)	Runoff and Infiltration	Pesticides, Herbicides, Fertilizers, Nitrate, Pathogens
ADF	Livestock Production-Dairies	Livestock Wastes, Runoff and Infiltration	Nitrate, Phosphate, Chloride, Pathogens, Pharmaceuticals
AFI	Farming-Irrigated Croplands	Runoff and Infiltration	Nitrate, Ammonia, Chloride, Fertilizers, Pesticides, Herbicides
AFL	Confined Animal Feeding Operations	Runoff and Infiltration of Livestock Wastes	Nitrate, Phosphate, Chloride, Pathogens, Pharmaceuticals
AFM	Farm Machinery Storage or Maintenance Areas	Farm Machinery Maintenance Areas	Automotive Wastes, Welding Wastes, Fuels, Oils, Lubricants
AFN	Farming-Non-irrigated Croplands	Runoff and Infiltration Operations	Nitrate, Ammonia, Chloride, Fertilizers, Pesticides, Herbicides
AHC	Horticultural/Gardens/Nurseries/Greenhouses	Operations/Storage	Pesticides, Herbicides, Fertilizers
AHF	Hay/Feed and Veterinary Product Storage Sites	Farm/Ranch Storage Site	Fungicides, Pesticides, Nitrates, Pharmaceuticals
AMA	Manure or Livestock Waste-Land Application Areas	Land Application of Manure	Nitrate, Ammonia, Phosphate, Chloride, Pathogens, Pharmaceuticals
AMS	Manure or Livestock Waste-Storage Facilities or Sites	Lined and Unlined Manure Storage Facilities	Nitrate, Ammonia, Phosphate, Chloride, Pathogens, Pharmaceuticals
AOA	Livestock Production-Other Animal	Livestock Wastes	Nitrate, Ammonia, Phosphate, Chloride, Pathogens, Pharmaceuticals
APF	Livestock Production -Poultry	Poultry Sewage Wastes	Nitrate, Ammonia, Phosphate, Chloride, Pathogens, Pharmaceuticals
APP	Processing Plants or Mills- Hay, Grain, or Produce	Operations, Waste Storage and Disposal	Organic/Inorganic Chemicals, Lubricants, Machinery Wastes
ARL	Animal Rangeland	Rangeland and Pasturage	Nitrate, Ammonia, Phosphate, Chloride, Pesticides, Pathogens
ASC	Bulk Agrochemical Storage-Petroleum/Chemicals	Storage-500 gallons or more	Petroleum Products, Inorganic/Organic Chemicals
ASF	Bulk Agrochemical Storage-Fertilizers	Feed Mill, Agricultural Co-op	Fertilizers
ASG	Bulk Agricultural Product Storage-Grain or Produce	Grain Elevator, Warehouse or Storage Site	Fungicides, Oils, Lubricants, Machinery Wastes

Map Code	Land Use	Description	Contaminants of Concern*
ASH	Livestock Production -Sheep	Livestock Sewage Wastes	Nitrate, Ammonia, Phosphate, Chloride, Pathogens, Pharmaceuticals
ASP	Bulk Agrochemical Storage-Pesticides	Feed Mill, Agricultural Co-op	Pesticides
ASW	Livestock Production -Swine	Livestock Sewage Wastes	Nitrate, Ammonia, Phosphate, Chloride, Pathogens, Pharmaceuticals
COMMERCIAL LAND USE			
CAI	Airports (Active/Inactive)	Operations/Maintenance/Construction	Aircraft Fuels, Deicers, Batteries, Diesel Fuel, Chlorinated Solvents, Automobile Wastes, Heating Oil, Building Wastes, Sewage, Septage, Pathogens, Pesticides, Fertilizers
CAR	Automotive Repair Shops	Operations/Maintenance/Storage	Solvents, Metals, Automotive Waste, Oils, Gasoline
CAW	Abandoned/Improperly Closed Wells	Storage/Disposal	Organic/Inorganic Chemicals, Brines, Waste Oil, Treated Sewage Effluent, Storm Water Runoff, Process Waste Water, Metals, Pathogens, Nitrate
CBS	Automotive Body Shops	Operations/Maintenance	Paints, Solvents
CBY	Boat Yards/Marinas	Operations/Maintenance	Gasoline, Diesel Fuels, Septage, Wood Treatment Chemicals, Paints, Varnishes, Automotive Wastes, Solvents, Building Wastes
CCG	Camp Grounds - Unsewered	Untreated Domestic Wastewater	Septage, Gasoline, Pesticides, Organic/Inorganic Chemicals
CCE	Cemeteries	Operations/Maintenance	Leachate, Arsenic, Pesticides, Fertilizers
CCW	Car Washes	Unsewered, Without Total Recycling System	Soaps, Detergents, Waxes, Organic/Inorganic Chemicals
CCY	Construction/Demolition Yard/Staging Areas	Storage/Maintenance	Gasoline, Diesel Fuels, Wood Treatment Chemicals, Paints, Varnishes, Automotive Wastes, Solvents, Building Wastes, Explosives, Oil
CDC	Dry Cleaning Shops	Operations/Maintenance	Chlorinated Solvents, Organic/Inorganic Chemicals
CFA	Fuel Storage Tanks-Above Ground	Non-Service Station Tanks	Gasoline, Diesel Fuel, Organic/Inorganic Chemicals
CFB	Fuel Storage Tanks-Below Ground	Non-Service Station Tanks	Gasoline, Diesel Fuel, Organic/Inorganic Chemicals
CFC	Funeral Homes/Crematories	Operations	Biohazard Waste, Organic/Inorganic Chemicals, Septage
CFR	Furniture Repair/Refinishing	Operations	Paints, Solvents, Organic Chemicals
CGC	Golf Courses	Operations/Maintenance	Fertilizers, Pesticides, Gasoline, Automotive Wastes, Batteries, Septage
CHG	Historic Gasoline Service Stations	Above/Below Ground Storage Tanks/Operations	Gasoline, Oils, Solvents, Automotive Wastes, Septage

Map Code	Land Use	Description	Contaminants of Concern*
CHM	Home Manufacturing	Operations/Maintenance/Storage	Paints, Solvents, Organic/Inorganic Chemicals
CHN	Hospitals/Nursing Homes - Unsewered	Wastewater Discharge to Septic Tank/Leach Field	Biohazard Waste, Organic/Inorganic Chemicals, Septage, Radiological Waste
CHW	Hardware/Lumber/Parts Stores	Operations/Storage	Pesticides, Fertilizers, Organic/Inorganic Chemicals
CLD	Laundromats - Unsewered	Wastewater Discharge	Detergents, Soaps, Septage
CPP	Photo Processing Laboratories	Operations/Storage	Organic/Inorganic Chemicals
CPR	Printing Shops	Operations/Storage	Solvents, Inks, Dyes, Organic/Inorganic Chemicals
CPS	Paint Stores	Storage	Paint, Solvents
CRL	Research Laboratories	Operations/Maintenance/Storage	Biohazard Waste, Radiological Materials and Waste, Metals, Organic/Inorganic Chemicals
CRY	Railroad Yards and Tracks	Operations/Maintenance/Storage	Diesel Fuel, Pesticides, Organic/Inorganic Chemicals
CSS	Gasoline Service Stations	Above/Below Ground Storage Tanks/Operations	Gasoline, Oils, Solvents, Automotive Wastes, Septage
CST	Commercial Septic Tanks/Leachfields/Leachpits/Cesspools	Storage/Disposal	Septage, Septic Effluent, Pathogens, Nitrate, Ammonia, Chloride
CVS	Veterinary Facilities	Operations/Maintenance	Biohazard Waste, Organic/Inorganic Chemicals, Septage, Radiological Waste
INDUSTRIAL LAND USE			
IAS	Asphalt Plants	Production/Storage	Petroleum Derivatives
ICC	Cement/Concrete Plants	Operations/Maintenance/Storage	Organic/Inorganic Chemicals, Oils, Natural Gas, Propane,
ICE	Communications Equipment Manufacturers	Production/Maintenance/Storage	Solvents, Organic/Inorganic Chemicals, Oils, Waste Oils, Metals
ICL	Chemical Landfills	Storage/Disposal	Leachate of Organic/Inorganic Chemicals, Acids, Bases, Metals, Solvents, Gasoline, Diesel Fuel, Pesticides, PCB's
ICP	Chemical Production Plants	Production/Maintenance/Storage	Organic/Inorganic Chemicals, Solvents, Oils, Metals
IEE	Electronic/Electrical Equipment Manufacturers	Production/Maintenance/Storage	Solvents, Organic/Inorganic Chemicals, Oils, Waste Oils, Metals, Acids, Bases
IFM	Furniture and Fixture Manufacturers	Production/Maintenance/Storage	Paints, Solvents, Organic/Inorganic Chemicals

Map Code	Land Use	Description	Contaminants of Concern*
IFW	Foundry/Smelting Plants	Production/Maintenance/Storage	Organic/Inorganic Chemicals, Metals, Solvents, Acids, Bases, Oils
IGO	Gas/Oil Wells-Active/Abandoned/Test, Wells Geothermal and Industrial	Production	Oil, Natural Gas, Organic/Inorganic Chemicals, Acids, Bases, Drilling Wastes
IHD	Historic Dumps/Landfills	Storage/Disposal	Leachate of Organic/Inorganic Chemicals, Acids, Bases, Metals, Solvents, Gasoline, Diesel Fuel, Pesticides, PCB's, Automotive Wastes
IHM	Historic Mining Operations	Production Waste/Storage	Metals, Inorganic Chemicals, Acids, Bases, Radiological Materials
IMI	Primary Metal Industries	Steel/Metal Works, Rolling/Wire Mills	Metals, Inorganic Chemicals, Acids, Bases
IMO	Mining Operations (Surface And Subsurface)	Production Waste/Storage	Metals, Inorganic Chemicals, Acids, Bases, Radiological Materials
IMP	Metal Plating/Processing Facilities	Operations/Maintenance/Storage	Organic/Inorganic Chemicals, Acids, Bases, Metals
IMW	Machine/Metal Working Shops	Operations/Maintenance/Storage	Cutting Oils, Metals, Solvents, Organic/Inorganic Chemicals, Detergents
IOG	Oil/Gas Pipelines	Transport	Oils, Gasoline, Volatile Organic Chemicals, Natural Gas, Propane
IPL	Plastics Manufacturing/Molder	Operations/Maintenance/Storage	Solvents, Oils, Organic/Inorganic Chemicals, Acids, Bases
IPM	Paper Mills	Operations/Maintenance/Storage	Acids, Metals, Organic/Inorganic Chemicals
IPP	Petroleum Production/Refining/ Bulk Plants	Operations/Maintenance/Storage	Oils, Gasoline, Diesel Fuels, Organic Chemicals, Oil Drilling/Refining Wastes
IPU	Public Utilities	Power Generating Stations	PCB's, Solvents, Diesel Fuel, Propane, Natural Gas, Oil, Acids, Bases, Organic/Inorganic Chemicals, Metals
IRG	RCRA Waste Generators - Other	Storage/Disposal	Organic/Inorganic Chemicals, Solvents, Metals, PCB's, Acids, Bases, Radiological Materials
IRW	Radioactive Waste Disposal Sites	Storage/Disposal	High and Low Level Radiological Wastes
ISD	Sumps/Dry Wells	Storage/Disposal	Storm Water Runoff, Organic/Inorganic Chemicals, Solvents, Process Wastewater, Pesticides, Oils
ISF	Superfund Sites	Storage/Disposal	Organic/Inorganic Chemicals, Solvents, Metals, PCB's, Acids, Bases, Radiological Materials
ISM	Primary Wood Industries	Saw Mills, Planers, Wood Treatment	Organic/Inorganic Chemicals, Metals, Solvents
IST	Stone, Tile, Glass Manufacturing	Operations/Maintenance/Storage	Solvents, Oils, Metals, Organic/Inorganic Chemicals
ITS	Treatment/Storage/Disposal Ponds/Lagoons	Treatment/Storage	Organic/Inorganic Chemicals, Metals, Acids, Bases, Sewage

Map Code	Land Use	Description	Contaminants of Concern*
ITT	Transport/Distribution, Warehouses, Truck Terminals	Operations/Maintenance/Storage	Gasoline, Diesel Fuels, Automotive Wastes, Metals, Organic/Inorganic Chemicals, Acids, Bases
IUD	Unregulated Dumps/Excavated Sites, Snow Dumps	Storage/Collection/Disposal	Organic/Inorganic Chemicals, Automotive Wastes, Oil, Gasoline, Runoff from Adjacent Sites
IUI	Underground Injection (UIC) Wells	Storage/Disposal	Organic/Inorganic Chemicals, Brines, Waste Oil, Treated Sewage Effluent, Storm Water Runoff, Process Wastewater, Metals, Pathogens, Nitrate
IUR	Utility/Transportation Right of Ways, major transportation corridor	Power Lines, Gas/Oil Pipelines	Pesticides, Gasoline, Diesel Fuels, Automotive Wastes, Organic/Inorganic Chemicals, PCB's, Sewage, Metals, Storm water Runoff, Pathogens
MUNICIPAL/RESIDENTIAL LAND USE			
MHM	Highway/Road Maintenance Yards	Operations/Maintenance/Storage	Gasoline, Diesel Fuels, Solvents, Road Salt, Asphalt, Pesticides, Automotive Wastes,
MHR	Highway Rest Areas	Operations/Maintenance/Storage/Disposal	Automotive Wastes, Septage, Gasoline, Diesel Fuels, Pesticides
MIN	Incinerators - Commercial or Municipal	Operations/Disposal	Metals, Organic/Inorganic Chemicals
MLF	Municipal Waste Landfills	Storage/Disposal	Leachate, Organic/Inorganic Chemicals, Pesticides, Metals, Oils
MMF	Military Facilities	Operations/Maintenance/Storage/Disposal	Gasoline, Aircraft Fuels, Diesel Fuels, Automotive Wastes, Metals, Organic/Inorganic Chemicals, Explosives, Radiological Materials, Pesticides, Sewage/Septage, Oils, Solvents, Fertilizers, Batteries, Deicers
MMP	Motor Pools	Operations/Maintenance/Storage/Disposal	Gasoline, Diesel Fuel, Oils, Waste Oils, Automotive Waste, Batteries, Metals
MPS	Sewage Pump Stations	Operations/Storage	Sewage, Pathogens, Nitrate, Metals, Organic/Inorganic Chemicals
MPW	Polluted Surface Water Sources	Naturally Occurring/Anthropogenic	Sewage, Pathogens, Nitrate, Metals, Acids, Bases, Organic/Inorganic Chemicals
MRF	Recycling Facilities	Operations/Storage/Disposal	Metals, Organic/Inorganic Chemicals, Pesticides, Automotive Wastes, Oils
MSC	Schools – Unsewered	Wastewater Discharge to Septic Tank/Leach Field	Septage, Septic Effluent, Pathogens, Nitrate, Ammonia, Chloride
MSD	Storm Drainage Collection Areas or Outlets-Unlined	Storage/Disposal	Runoff, Pesticides, Fertilizer, Pathogens, Nitrate, Phosphate, Oil
MSL	Sewer Lines	Transport	Sewage, Pathogens, Nitrate, Metals, Organic/Inorganic Chemicals
MSP	Wastewater Seepage/Retention Ponds (Unlined/Lined)	Storage/Disposal	Sewage Effluent, Nitrate, Ammonia, Pathogens, Organic/Inorganic Chemicals, Pesticides
MSS	Sewage Effluent/Sludge Land Application Areas	Storage/Disposal	Sewage/Sewage Sludge, Nitrate, Pathogens, Organic/Inorganic Chemicals, Metals
MST	Sewage Treatment Plants	Operations/Maintenance/Storage/Disposal	Sewage, Sewage Sludge, Metals, Pathogens, Organic/Inorganic Chemicals

Map Code	Land Use	Description	Contaminants of Concern*
MSW	Solid Waste Transfer Stations	Storage/Disposal	Metals, Organic/Inorganic Chemicals, Pesticides, Automotive Wastes, Oils
MWP	Water Treatment Plants and Water Supply Wells	Operations/Maintenance/Storage/Disposal	Organic/Inorganic Chemicals, Chlorine
RSF	Single Family Residences - Unsewered	Wastewater Discharge to Septic Tank/Leach Field or Cesspool	Septage, Pathogens, Nitrate, Ammonia, Chloride, Heavy Metals, Household Pesticides, Herbicides, Cleaning Agents and Solvents, Fuels
* Contaminants of Concern include substances that are commonly, but not always, associated with the Contaminant Source listed in column 2			

Name of Contaminant	MCL *	Potential Contaminant Source (by Contaminant Code)***	Health Effects
VOLATILE ORGANIC CHEMICALS			
Benzene	0.005	AAP, APP, CAI, CAR, CBS, CBY, CCY, CDC, CHW, CHM, CHN, CSY, CPP, CPR, CPS, CRL, CRY, CUS, CVS, ICC, ICE, ICL, ICP, IEE, IFW, IFM, IHD, ILS, IMI, IMW, IMP, IPL, IPM, IPP, IPU, IRG, ISD, ISF, ISM, IST, ITS, ITT, IUD, IUI, IUR, MMF, MMP, MSW	Anemia; decrease in blood platelets; nervous system disorders; immune system depression; increased risk of cancer
Carbon Tetrachloride	0.005	AAP, APP, CAI, CDC, CHM, CHN, CHW, CPP, CPR, CRL, CUS, CVS, ICE, ICL, ICP, IEE, IHD, ILS, IMI, IMP, IMW, IPL, IPM, IPP, IPU, IRG, ISD, ISF, ISM, IST, ITS, ITT+, IUD, MLF, MMF, MMP, MSC, MSW	Liver problems; kidney, lung damage; increased risk of cancer
Ortho-Dichlorobenzene	0.6	CAR, CBS, CBY, CCY, CDC, CFR, CHM, CHW, CPP, CPR, CPS, CRL, CRY, CUS, ICE, ICP, ICL, IEE, IFM, IHD, ILS, IMI, IMP, IMW, IPL, IPM, IPP, IPU, IRG, ISD, ISF, ISM, IST, ITS, ITT, IUD, MHM, MMF, MMP, MSC	Liver, kidney, nervous system or circulatory problems
Para-Dichlorobenzene	0.075	ACS, AFI, AFN, AHC, AHF, ASC, ASP, CAR, CDC, CPP, CHW, CPP, CPR, CPS, CRL, CRY, CUS, ICL, ICP, ILS, IMP, IMW, IPL, IPP, IPU, IRG, ISF, ITS, ITT, MMF, MMP, MSC	Eye, respiratory, gastrointestinal tract irritation; anemia; skin lesions; liver, kidney, spleen damage; blood changes
1, 2-Dichloroethane	0.005	ACS, AFI, AFN, AHC, AHF, ASC, ASG, ASP, CFR, CHN, CPP, CPR, CRL, CUS, CVS, ICL, ICP, IEE, IFM, ILS, ITT, IMW, IPL, IPP, IRG, ISD, ISF, IUD, MMF, MSC	Nervous system disorders; lung, kidney, liver, circulatory, gastrointestinal effects; increased risk of cancer
1,1-Dichloroethene	0.007	CPP, CPR, CRL, CUS, ICP, ICL, IHD, ILS, IMW, IPL, IPM, IPU, IRG, ISD, ISF, ISM, ITS, ITT, IUD, MSC	Liver, kidney damage; increased risk of cancer; fetal toxicity
Cis-1, 2-Dichloroethene	0.07	AAP, CAI, CAR, CBS, CCY, CFR, CHG, CHM, CPP, CPR, CPS, CRL, CRY, CSS, CSY, ICP, ICL, IEE, IFM, IHD, ILS, IMI, IMP, IMW, IPL, IPM, IPP, IPU, IRG, ISD, ISF, ISM, ITS, ITT, IUD, IUI, MMF, MMP, MSP, MST	Nervous system disorders; liver, circulatory system damage
Trans-1, 2-Dichloroethene	0.1	AAP, CAI, CAR, CBS, CCY, CFR, CHG, CHM, CPP, CPR, CPS, CRL, CRY, CSS, CSY, IEE, IFM, ICP, ICL, IHD, ILS, IMI, IMP, IMW, IPL, IPM, IPP, IPU, IRG, ISD, ISF, ISM, ITS, ITT, IUD, IUI, MMF, MMP, MSP, MST	Nervous system disorders; liver, circulatory system damage
Dichloromethane	0.005	AAP, APP, ACS, AFI, AFN, AHC, AHF, ASC, ASG, ASP, CAI, CAR, CBS, CBY, CCE, CCY, CFC, CFR, CHN, CHW, CHM, CPP, CPR, CPS, CRY, CRL, CSS, CUS, CVS, ICC, ICE, ICP, ICL, IEE, IFM, IHD, ILS, IMI, IMP, IMW, IPL, IPM, IPP, IPU, IRG, ISD, ISF, ISM, IST, ITS, ITT, IUD, MHM, MMF, MMP, MSC, MSP, MSW	Nervous system, liver, blood damage; increased risk of cancer

Name of Contaminant	MCL *	Potential Contaminant Source (by Contaminant Code)***	Health Effects
1,2-Dichloropropane	0.1	ACS, AFI, AFN, AHC, AHF, ASC, ASG, ASP, CAW, CPP, CPR, CRL, CUS, ICL, ICP, IHD, ILS, IPM, IPP, IRG, ISD, ISF, ISM, ITT, IUD, IUI, MLF, MSP	Liver, kidney, adrenal glands, bladder, gastrointestinal tract, respiratory tract damage; increased risk of cancer
Ethylbenzene	0.1	CAI, CFR, CHM, CRL, CUS, ICC, ICP, ICL, IEE, IFM, IHD, ILS, IMI, IMP, IMW, IPL, IPM, IPP, IRG, ISD, ISF, ISM, ITS, ITT, IUD, IUI, MSC, MSP	Eye, liver, kidney, central nervous system damage; respiratory irritation
Chlorobenzene	0.005	CAR, CBS, CDC, CHW, CHM, CPP, CPR, CRL, CUS, ICP, ICL, IEE, IHD, ILS, IMI, IMP, IMW, IPL, IPP, IPU, IRG, ISD, ISF, ITS, ITT, IUD, IUI, MMF, MSC, MSP	Liver, kidney, central nervous system damage
Styrene	1	CHM, CPP, CPR, CRL, CUS, ICC, ICP, ICL, IEE, IHD, ILS, IMI, IMP, IMW, IPL, IPM, IPP, IRG, ISD, ISF, ISM, ITS, ITT, IUD, IUI, MSP	Liver, kidney, circulatory problems; nerve damage; increased risk of cancer
Tetrachloroethene	0.005	AAP, APP, CAI, CAR, CBS, CCY, CDC, CHM, CHN, CHW, CPP, CPR, CRL, CRY, CSS, CSY, CUS, CVS, ICC, ICL, ICP, IEE, IHD, ILS, IMI, IMO, IMP, IMW, IPL, IPM, IPP, IPU, IRG, ISD, ISF, ISM, ITS, ITT, IUD, IUI, MMF, MMP, MSC, MSP, MWP	Liver, kidney, circulatory problems; nerve damage; increased risk of cancer
Toluene	1	AAP, APP, CFR, CHW, CHM, CHN, CPP, CPR, CRL, CUS, CVS, ICC, ICP, ICL, IEE, IFM, IHD, ILS, IMI, IMP, IMW, IPL, IPM, IPP, IPU, IRG, ISD, ISF, ISM, ITS, ITT, IUD, MMF, MSC, MSP, MWP	Nervous system, liver, kidney damage
1,2,4-Trichlorobenzene	0.07	CRL, CUS, ICL, ICP, IHD, ILS, IPM, IPP, IRG, ISD, ISF, ISM, ITS, IUD	Liver, kidney, adrenal gland changes
1,1,1-Trichloroethane	0.2	AAP, APP, CAR, CAI, CBS, CBY, CCY, CDC, CFR, CHM, CHN, CHW, CPP, CPR, CRL, CUS, CVS, ICP, ICL, IEE, IFM, IHD, IHM, ILS, IMI, IMO, IMP, IMW, IPM, IPP, IRG, ISD, ISF, ISM, ITS, ITT, IUD, MHM, MMF, MMP, MSC, MSP, MWP	Liver, nervous system, circulatory problems
1,1,2-Trichloroethane	0.005	AAP, CDC, CPP, CPR, CRL, CUS, ICP, ICL, IEE, IFW, IHD, ILS, IMI, IMP, IMW, IPL, IPP, IRG, ISD, ISF, ITS, IUD, MSP	Liver, kidney, gastrointestinal tract, immune system problems; lung damage; increased risk of cancer
Trichloroethene	0.005	AAP, AFM, APP, CAI, CAR, CBS, CBY, CFR, CHG, CHM, CHW, CPP, CPR, CRL, CRY, CSY, CUS, ICE, ICL, ICP, IEE, IFM, IHD, ILS, IMI, IMP, IMW, IPL, IPM, IPP, IPU, IRG, ISD, ISF, ISM, ITS, ITT, IUD, IUI, MHM, MMF, MMP, MSC, MSP	Liver damage; increased risk of cancer

Name of Contaminant	MCL *	Potential Contaminant Source (by Contaminant Code)***	Health Effects
Vinyl Chloride	0.002	CRL, ICP, ICL, IEE, IHD, IMI, IMP, IMW, IPL, IPP, IRG, ISF, IST, ITT, IUD,	Liver, nervous system damage; increased risk of cancer
Xylenes (Total)	10	AAP, APP, ASC, CAI, CAR, CBS, CBY, CCY, CFR, CHM, CHN, CHW, CPP, CPR, CPS, CRL, CUS, CVS, IAS, ICC, ICL, ICP, IEE, IFM, IHD, ILS, IMI, IMP, IMW, IPL, IPM, IPP, IPU, IRG, ISD, ISF, ISM, IST, ITT, IUD, MHM, MMF, MSC, MSP	Central nervous system, liver, kidney damage
SYNTHETIC ORGANIC CHEMICALS: PESTICIDES			
Alachlor	0.002	ACS, ADC, AFI, AFN, AHC, ARL, ASC, ASP, CCE, CCG, CGC, CHW, CRL, CRY, CUS, ICL, ICP, IHD, ILS, IPP, IRG, ISD, ISF, ITS, ITT, IUD, IUI, IUR, MHM, MHR, MMF, MPR, MSC, MSD, MSP	Eye, skin irritation; liver, kidney, spleen, nose, eye damage; increased risk of cancer
Aldicarb	0.003	ACS, ADC, AFI, AFN, AHC, ASC, ASP, CAW, CGC, CHW, CRL, CUS, ICL, ICP, IHD, ILS, IPP, IRG, ISD, ISF, ITS, ITT, IUD, MPR, MPW, MSC, MSP	Gastrointestinal, central nervous system, eye problems
Aldicarb Sulfone	0.003	ACS, ADC, AFI, AFN, AHC, ASC, ASP, CAW, CGC, CHW, CRL, CUS, ICL, ICP, IHD, ILS, IPP, IRG, ISD, ISF, ITS, ITT, IUD, MPR, MPW, MSC, MSP	Gastrointestinal, central nervous system, eye problems
Aldicarb Sulfoxide	0.003	ACS, ADC, AFI, AFN, AHC, ASC, ASP, CAW, CGC, CHW, CRL, CUS, ICL, ICP, IHD, ILS, IPP, IRG, ISD, ISF, ITS, ITT, IUD, MPR, MPW, MSC, MSP	Gastrointestinal, central nervous system, eye problems
Atrazine	0.003	ACS, ADC, AFI, AFN, AHC, ARL, ASC, ASP, CAI, CAW, CCG, CCE, CFC, CGC, CHW, CRL, CRY, CUS, ICL, ICP, IHD, ILS, IPP, IPU, IRG, ISD, ISF, ITS, ITT, IUD, IUI, IUR, MHD, MHM, MLF, MMF, MPR, MPW, MSC, MSD, MSP, RMS	Cardiovascular system, kidney, adrenal gland damage; increased risk of cancer
Carbofuran	0.04	ACS, ADC, AFI, AFN, AHC, ASC, ASP, CAI, CAW, CCE, CCG, CGC, CHW, CPL, CRL, CST, CUS, ICL, ICP, IHD, ILS, IPP, IPU, IRG, ISD, ISF, ITS, ITT, IUD, IUI, IUR, MHR, MLF, MMF, MPR, MSC, MSD, MSP, RMS	Central nervous system, reproductive system damage
Chlordane	0.002	ACS, ADC, AFI, AFN, AHC, ASC, ASP, CAI, CAW, CBY, CCY, CRL, CST, CUS, ICP, ICL, IHD, ILS, IPP, IPU, IRG, ISD, ISF, ITS, ITT, IUD, IUR, MHM, MLF, MMF, MPR, MRF, MSC, MSD, MSP, RMS	Central nervous system, blood disorders; liver, kidney, heart, lung, spleen, adrenal gland damage; increased risk of cancer

Name of Contaminant	MCL *	Potential Contaminant Source (by Contaminant Code)***	Health Effects
2, 4-Dichlorophenoxyacetic acid (2,4-D)	0.07	ACS, ADC, AFI, AFN, AHC, ARL, ASC, ASP, CAI, CAW, CCE, CCG, CCY, CGC, CHW, CRL, CRY, CST, CUS, ICL, ICP, IHD, ILS, IPP, IPU, IRG, ISD, ISF, ITS, ITT, IUD, IUR, MHM, MHR, MLF, MMF, MPR, MPW, MSC, MSD, MSP	Nervous system, kidney, liver damage
Dalapon	0.2	ACS, ADC, AFI, AFN, AHC, ARL, ASC, ASP, CAI, CAW, CCE, CCG, CCY, CGC, CHW, CRL, CRY, CSY, CUS, ICL, ICP, IHD, ILS, IPP, IPU, IRG, ISD, ISF, ITS, ITT, IUD, IUI, IUR, MHD, MHM, MHR, MLF, MMF, MPR, MPW, MSC, MSD, MSP, RMS	Kidney changes
Dibromochloropropane	0.0002	ACS, ADC, AFI, AFN, AHC, ASC, ASP, CAI, CAW, CCE, CGC, CHW, CRL, CUS, ICL, ICP, IHD, ILS, IPP, IPU, IRG, ISD, ISF, ITS, ITT, IUD, IUR, MHM, MMF, MSC, MSD, MSP	Kidney, liver, reproductive system damage; increased risk of cancer
Dinoseb	0.007	ACS, ADC, AFI, AFN, AHC, ARL, ASC, ASP, CHW, CRL, ICL, ICP, IHD, IRG, ISD, ISF, ITT, IUD	Reproductive system problems
Diquat	0.02	ACS, ADC, AFI, AFN, AHC, AHF, ARL, ASC, ASG, ASP, CAW, CGC, CRL, CUS, ICL, ICP, IHD, ILS, IPP, IPU, ISD, ISF, ITS, ITT, IUD, IUR, MHM, MMF, MPW, MSD, MSP	Cataracts
Endothall	0.1	ACS, ADC, AFI, AFN, AHC, AHF, ARL, ASC, ASG, ASP, CAI, CAW, CBY, CCE, CCG, CCY, CGC, CHW, CPL, CRL, CRY, CST, CUS, ICL, ICP, IHD, ILS, IPP, IPU, IRG, ISD, ISF, ITS, ITT, IUD, IUR, MHM, MHR, MLF, MMF, MPR, MPW, MSC, MSD, MSP	Stomach, intestinal problems
Endrin	0.002	ACS, ADC, AFI, AFN, AHC, AHF, ARL, ASC, ASG, ASP, CAW, CRL, CRV, CRY, CST, CUS, ICL, ICP, IHD, ILS, IPP, IPU, IRG, ISD, ISF, ITS, ITT, IUD, IUR, MHM, MMF	Central nervous system problems; liver damage
Ethylene Dibromide (EDB)	0.00005	ACS, ADC, AHC, APP, ASC, ASG, ASP, CAI, CAW, CFR, CHW, CPP, CPR, CPS, CRL, CUS, ICL, ICP, IFM, IHD, ILS, IPL, IPP, IRG, ISD, ISF, ITS, ITT, IUD, MMF, MSP	Liver, stomach, adrenal gland, reproductive system, respiratory, nervous system, heart, kidney damage; increased risk of cancer
Glyphosate	0.7	ACS, ADC, AFI, AFN, AHC, AHF, AHF, ARL, ASC, ASP, CAI, CAW, CCE, CCG, CCY, CGC, CHW, CPL, CRL, CRY, CUS, ICL, ICP, IHD, ILS, IPP, IPU, IRG, ISD, ISF, ITS, IUD, IUI, IUR, MHM, MHR, MLF, MMF, MPR, MPW, MSC, MSD, MSP, RMS	Respiratory problems; kidney, reproductive system damage
Heptachlor	0.0004	CAI, CCY, CGC, CPL, CRL, CRV, CRY, ICE, ICL, ICP, IHD, IPP, IPU, ISF, ITT, IUD, IUR, MHM, MMF, MSC	Central nervous system, liver damage; increased risk of cancer

Name of Contaminant	MCL *	Potential Contaminant Source (by Contaminant Code)***	Health Effects
Heptachlor Epoxide	0.0002	CAI, CCY, CGC, CPL, CRL, CRV, CRY, ICE, ICL, ICP, IHD, IPP, IPU, ISF, ITT, IUD, IUR, MHM, MMF, MSC	Central nervous system, liver damage; increased risk of cancer
Hexachlorobenzene	0.001	ACS, ADC, ASC, ASG, ASP, CPP, CPR, CRL, CUS, ICL, ICP, IHD, ILS, IMW, IPL, IPP, IRG, ISF, ITS, ITT, IUD, MMF	Skin lesions; nerve, liver, kidney damage; reproductive system problems; endocrine gland tumors; increased risk of cancer
Hexachlorocylopentadiene	0.05	CRL, CUS, ICL, ICP, IHD, ILS, IPL, IPP, IRG, ISF, ITS, ITT, IUD	Gastrointestinal problems; liver, kidney, heart damage
Lindane	0.0002	ACS, ADC, ADF, AFI, AFL, AFN, AHC, ARL, ASC, ASP, CCY, CHW, CPP, CPR, CRL, CVS, ICL, ICP, IHD, IPM, IPP, IRG, ISF, ISM, ITS, ITT, IUD, MHM, MMF, MSC, MSP	Liver, kidney damage; pulmonary problems
Methoxychlor	0.04	ACS, ADC, ADF, AFI, AFL, AFN, AHC, AHF, ASC, ASG, ASH, ASP, ASW, CBY, CCG, CGC, CHW, CRL, CUS, ICL, ICP, IHD, ILS, IPP, IPU, IRG, ISD, ISF, ITS, ITT, IUD, IUR, MHD, MHR, MMF, MPR, MSC, MSD	Central nervous system, gastrointestinal tract problems; liver, kidney, heart damage
Oxamyl (Vydate)	0.2	ACS, ADC, AFI, AFN, AHC, ASC, ASP, CAW, CCE, CGC, CHW, CRL, ICL, ICP, IHD, IPP, IPU, IRG, ISD, ISF, ITS, ITT, IUD, IUI, IUR, MHM, MLF, MMF, MSC, MSP	Central nervous system problems
Pentachlorophenol	0.001	ACS, ADC, AFI, AFN, AHC, ASC, ASP, CBY, CCY, CFR, CHW, CRL, CRY, ICL, ICP, IFM, IHD, IPM, IPP, IPU, IRG, ISF, ISM, ITT, IUD, MHM, MLF, MMF	Central nervous system damage, liver, kidney, reproductive system damage; increased risk of cancer
Picloram	0.5	ACS, ADC, AFI, AFN, AHC, ARL, ASC, ASP, CAI, CAW, CCE, CCG, CCY, CGC, CHW, CPL, CRL, CRY, ICL, ICP, IHD, IPP, IPU, IRG, ISD, ISF, ITS, ITT, IUD, IUI, IUR, MHD, MHM, MHR, MLF, MMF, MPR, MSC, MSD, MSP, RMS	Central nervous system, liver damage
Simazine	0.004	ACS, ADC, AFI, AFN, AHC, ARL, ASC, ASP, CAI, CAW, CBY, CCG, CCE, CCY, CGC, CHW, CPL, CRL, CRY, CSY, ICL, ICP, IHD, IPP, IPU, IRG, ISD, ISF, ITS, ITT, IUD, IUI, IUR, MHD, MHM, MHR, MLF, MMF, MPR, MPW, MSC, MSD, MSP	Reproductive system, blood, kidney, liver, thyroid damage; gene mutation; increased risk of cancer
2,3,7,8-TCDD (Dioxin)	3x10-8	CAI, CRL, ICL, ICP, IEE, IHD, IPP, IPU, ISF, IUD, IUR, MIN, MMF, MSW	Reproductive system problems; birth defects; increased risk of cancer

Name of Contaminant	MCL *	Potential Contaminant Source (by Contaminant Code)***	Health Effects
Toxaphene	0.003	ACS, ADC, AFI, AFL, AFN, APF, ARL, ASC, ASP, CRL, ICL, ICP, IHD, IPP, ISF, IUD	Central nervous system, thyroid problems; liver, kidney degeneration; increased risk of cancer
2,4,5-TP (Silvex)	0.05	ACS, ADC, ARL, ASC, ASP, CBY, CCE, CGC, CRL, CRY, ICL, ICP, IHD, IPP, IPU, ISF, ITT, IUD, IUR, MHM, MLF, MMF	Liver, kidney damage; central nervous system problems
Benzo (a) pyrene	0.0002	AFM, CAI, CAR, CBS, CCY, CFC, CRL, CRY, IAS, ICC, ICL, ICP, IFW, IHD, IMI, IMP, IPL, IPP, IPU, IRG, ISF, IST, ITT, MFS, MHM, MIN, MLF, MMF, MMP, MSC	Anemia; immune system depression; reproductive, developmental problems; increased risk of cancer
Di (2-ethylhexyl) adipate	0.4	AAP, CAI, CAR, CBY, CCY, CHW, CPS, CRL, CST, ICL, ICP, IHD, IMI, IMP, IMW, IPL, IPP, IPU, IRG, ISF, ITS, ITT, IUD, MIN, MLF, MMF, MMP, MSL, MSP, MSS, MST	Liver, reproductive system damage; increased risk of cancer
Di (2-ethylhexyl) phthalate	0.006	AAP, APP, CHM, CHW, CPP, CPR, CRL, CSY, ICE, ICL, ICP, IEE, IHD, IMP, IMW, IPL, IPP, IRG, ISF, IST, ITT, IUD, MHM, MIN, MLF, MMF, MRF, MSW	Liver, reproductive system damage; increased risk of cancer
Polychlorinated Biphenyls (PCB's)	0.0005	ACS, ASC, CAI, CCY, CHM, CRL, CRY, CST, CSY, ICL, ICP, IEE, IHD, IMI, IMP, IMW, IPL, IPM, IPP, IPU, IRG, ISF, ISM, ITS, IUD, IUR, MHM, MIN, MLF, MMF, MSS, MST, MSW	Skin problems, thymus gland, reproductive system, immune system problems; liver function changes; increased risk of cancer
INORGANIC CHEMICALS			
Antimony	0.006	CRL, CSY, ICL, ICP, IEE, IFW, IHD, IMI, IMP, IPL, IPP, IRG, ISF, IST, IUD, MIN, MLF, MSW	Blood changes; increased risk of cancer
Arsenic	0.05	AAP, ACS, ADC, AFI, AFN, AHC, APP, ASC, ASP, CAI, CAR, CBS, CCE, CCY, CFC, CGC, CHM, CHN, CPP, CPR, CRL, CRV, CSY, CVS, ICL, ICP, IEE, IHD, IMI, IMP, IMW, IPM, IPP, IRG, ISF, ISM, IUD, IPU, MLF, MMF, MSC, MSW	Skin damage; circulatory problems; increased risk of cancer
Asbestos	7 MLF (million fibers/Liter)	CAI, CAR, CBS, CBY, CCY, CHM, CHN, CHW, CRL, CRV, CRY, CSY, ICC, ICL, ICP, IHD, IHM, IMI, IMO, IMW, IPU, IRG, ISF, IST, ITT, IUD, MHD, MHM, MIN, MLF, MMF, MMP, MSC, MSW, MWP	Lung disease, increased risk of cancer

Name of Contaminant	MCL *	Potential Contaminant Source (by Contaminant Code)***	Health Effects
Barium	2	CAI, CAR, CAW, CBS, CCY, CFR, CHM, CHN, CHW, CPP, CPR, CRL, CRV, CRY, CSY, CVS, ICC, ICL, ICP, IEE, IFW, IFM, IGO, IHD, IHM, IMI, IPL, IPM, IPP, IPU, IRG, ISF, ISM, IST, ITT, IUD, IUI, IUR, MHM, MIN, MLF, MMF, MMP, MSC, MSW	Gastrointestinal problems; high blood pressure
Beryllium	0.004	CRL, CSY, ICL, ICP, IEE, IFW, IHD, IHM, IMI, IMO, IMP, IMW, IPP, IPU, IRG, IRW, ISF, IST, IUD, MIN, MLF, MMF, MSW	Lung, bone damage; increased risk of cancer
Cadmium	0.005	AAP, APP, CAI, CAR, CBS, CBY, CCY, CHG, CHM, CHW, CPP, CPR, CPS, CRL, CRY, CSS, CSY, ICC, ICE, ICL, ICP, IEE, IFW, IHD, IHM, IMI, IMO, IMP, IMW, IPL, IPM, IPP, IPU, IRG, ISF, ISM, IST, ITT, IUD, IUR, MHM, MIN, MLF, MMF, MMP, MSC, MSP, MSS, MST, MSW, MWP	Gastrointestinal problems; kidney, liver, bone, blood damage
Chromium	0.1	CPP, CPR, CRL, CSY, ICC, ICL, ICP, IEE, IFW, IHD, IHM, IMI, IMO, IMP, IMW, IPP, IPU, IRG, ISF, IST, ITS, ITT, IUD, MIN, MLF, MMF, MPW, MSC, MSP, MSS, MST	Skin problems; liver, kidney, circulatory, nerve damage.
Copper	1.3 TT** Action Level	AAP, ACS, ADC, AHC, APF, APP, ASC, ASP, CAR, CBS, CCY, CHM, CHN, CHW, CPP, CPR, CRL, CRY, CST, CSY, CVS, ICL, ICP, IEE, IFM, IFW, IHD, IHM, IMI, IMO, IMP, IMW, IPL, IPM, IPP, IPU, IRG, ISF, ISM, IST, ITS, ITT, IUD, MIN, MLF, MMF, MSP, MSS, MST, MSW	Gastrointestinal problems; liver, kidney damage; anemia
Cyanide	0.2	ACS, ADC, AFI, AFN, AHC, ASC, ASP, CCY, CHN, CHW, CPP, CPR, CPS, CRL, CST, CUS, CVS, ICL, ICP, IEE, IFW, IHD, ILS, IMI, IMP, IMW, IPL, IPM, IPP, IPU, IRG, ISD, ISF, ISM, IST, ITS, ITT, IUD, MHM, MLF, MMF, MPW, MSC, MSS, MST	Thyroid problems; nerve damage
Fluoride	4	ACS, ADC, ASC, ASF, CCY, ICC, ICL, ICP, IFW, IHM, IMI, IMO, IMP, IST, IUD, MWP	Tooth mottling; bone disease
Lead	0.015 TT**	CAI, CAR, CBS, CBY, CCY, CFR, CHG, CHM, CHN, CHW, CPP, CPR, CPS, CRL, CRY, CSY, ICC, ICL, ICP, IEE, IFM, IFW, IHD, IHM, IMI, IMO, IMP, IMW, IPL, IPM, IPP, IPU, IRG, ISF, ISM, IST, ITS, ITT, IUD, IUR, MHD, MHM, MIN, MLF, MMF, MMP, MRF, MSC, MSP, MSS, MST, MSW, MWP, RMS	Blood, neurological development problems; kidney disease; stroke; increased risk of cancer
Mercury	0.002	AAP, ACS, ADC, AFI, AFN, AHC, APP, ASC, ASP, CAI, CAR, CBS, CBY, CCY, CFR, CHM, CHN, CHW, CPP, CPR, CRL, CRV, CRY, CST, CSY, CUS, CVS, ICE, ICL, ICP, IEE, IFM, IFW, IHD, IHM, ILS, IMI, IMO, IMP, IMW, IPL, IPM, IPP, IPU, IRG, ISF, ISM, IST, ITS, ITT, IUD, IUR, MHM, MIN, MLF, MMF, MPW, MRF, MSC, MSP, MSS, MST, MSW	Kidney damage
Nickel	0.1	CAI, CAR, CBS, CBY, CCY, CPP, CPR, CRL, CST, CSY, CUS, ICE, ICL, ICP, IEE, IFW, IHD, IHM, ILS, IMI, IMO, IMP, IMW, IPL, IPM, IPP, IPU, IRG, ISF, IST, ITS, ITT, IUD, MHM, MIN, MLF, MMF, MMP, MPW, MRF, MSC, MSP, MSS, MST, MSW	Gastrointestinal irritation; nerve, liver, kidney, reproductive system damage

Name of Contaminant	MCL *	Potential Contaminant Source (by Contaminant Code)***	Health Effects
Nitrate	10	AAP, ACS, ADC, ADF, AFI, AFL, AFN, AHC, AMA, AMS, AOA, APF, APP, ARL, ASC, ASF, ASH, ASW, CAI, CAW, CBB, CBY, CCE, CCG, CCW, CCY, CFC, CGC, CHG, CHN, CPL, CPP, CPR, CRL, CST, CVS, ICL, ICP, IHD, IHM, IMI, IMO, IMP, IMW, IPL, IPM, IPP, IPU, ISD, ISF, ISM, ITS, ITT, IUD, IUR, MHD, MHM, MLF, MMF, MPR, MPS, MPW, MSC, MSD, MSL, MSP, MSS, MST, MSW, MWP, RMS	Methemoglobinemia; spleen damage
Nitrite	1	AAP, ACS, ADC, ADF, AFI, AFL, AFN, AHC, AMA, AMS, AOA, APF, APP, ARL, ASC, ASF, ASH, ASW, CAI, CAW, CBB, CBY, CCG, CCE, CCW, CCY, CFC, CGC, CHG, CHN, CPL, CPP, CPR, CRL, CST, CVS, ICL, ICP, IHD, IHM, IMI, IMO, IMP, IMW, IPL, IPM, IPP, IPU, ISD, ISF, ISM, ITS, ITT, IUD, IUR, MHD, MHM, MLF, MMF, MPR, MPS, MPW, MSC, MSD, MSL, MSP, MSS, MST, MSW, MWP, RMS	Methemoglobinemia; spleen damage
Selenium	0.05	ADC, AFI, AFN, ARL, CPP, CPR, CRL, ICC, ICL, ICP, IEE, IFW, IHD, IHM, IMI, IMO, IMP, IMW, IPL, IPM, IPP, IPU, IRG, ISF, IST, IUD, MHM, MIN, MLF, MMF, MPW, MSC, MSS, MST, MSW	Peripheral nervous system, kidney, liver, circulatory system damage
Thallium	0.002	CHN, CPP, CRL, ICC, ICE, ICL, ICP, IEE, IFW, IHD, IHM, IMI, IMO, IMP, IPL, IPP, IPU, IRG, ISF, IUD, IUR, MIN, MLF, MMF, MSS, MST, MSW	Blood chemistry changes; nerve, liver, kidney, intestinal, reproductive system damage
RADIONUCLIDES			
Beta Particles and Photon Emitters	4 Millirems per year	CAW, CHN, CRL, IGO, IHM, IMO, IRG, IRW, ISF, MMF, MWP	Increased risk of cancer
Gross Alpha Particle Activity	15 Picocuries per Liter	CAW, CHN, CRL, IGO, IHM, IMO, IRG, IRW, ISF, MMF, MWP	Increased risk of cancer
Radium 226 and Radium 228 (Combined)	5 Picocuries per year	CAW, CHN, CRL, IGO, IHM, IMO, IRG, IRW, ISF, MMF, MWP	Increased risk of cancer
MICROBIOLOGICAL (Pathogenic organisms)			
Crytosporidium parvum		AAP, ADC, ADF, AFL, AMA, AMS, AOA, APF, APP, ARL, ASH, ASW, CAW, CBY, CCG, CFC, CHN, CPL, CRV, CSS, CST, CVS, ISD, ITS, IUI, IUR, MHD, MHR, MMF, MPR, MPS, MPW, MSC, MSD, MSL, MSP, MSS, MST, MWP, RMS	Cryptosporidiosis (a gastroenteric disease)
Giardia lambia	TT**	AAP, ADC, ADF, AFL, AMA, AMS, AOA, APF, APP, ARL, ASH, ASW, CAW, CBY, CCG, CFC, CHN, CPL, CRV, CSS, CST, CVS, ISD, ITS, IUI, IUR, MHD, MHR, MMF, MPR, MPS, MPW, MSC, MSD, MSL, MSP, MSS, MST, MWP, RMS	Giardiasis (a gastroenteric disease)

Name of Contaminant	MCL *	Potential Contaminant Source (by Contaminant Code)***	Health Effects
Legionella sp.	TT**	ADC, CBY, ITS, MPW, MSD, MSP, MWP	Legionnaire's Disease; pneumonia
Total Coliforms (Including	5 Percent (See NOTE 1)	AAP, ADC, ADF, AFL, AMA, AMS, AOA, APF, APP, ARL, ASH, ASW, CAW, CBY, CCG, CFC, CHN, CPL, CRV, CSS, CST, CVS, ISD, ITS, IUI, IUR, MHD, MHR, MMF, MPR, MPS, MPW, MSC, MSD, MSL, MSP, MSS, MST, MWP, RMS	Used as an indicator that other potentially harmful bacteria may be present (see NOTE 2)
Fecal Coliform & E. coli)			
Turbidity	TT**	ADC, CBY, CCG, CCW, CCY, CGC, CPL, CRV, CRY, ICC, IHD, IHM, IMO, IPM, IUD, IUR, MHD, MHM, MHR, MIN, MLF, MMF, MPR, MPW, MRF, MSC, MSD, MSL, MSP, MSS, MST, MSW, RMS	Turbidity has no health effects but can interfere with disinfection and provide a medium for bacterial growth. It may indicate the presence of microbes
Viruses (Enteric)	TT**	AAP, ADC, ADF, AFL, AMA, AMS, AOA, APF, APP, ARL, ASH, ASW, CAW, CBY, CCG, CFC, CHN, CPL, CRV, CSS, CST, CVS, ISD, ITS, IUI, IUR, MHD, MHR, MMF, MPR, MPS, MPW, MSC, MSD, MSL, MSP, MSS, MST, MWP, RMS	Gastroenteric disease

Conservative Values were used to complete the DRASTIC Index under the Sensitivity Analysis when adequate and/or complete information was not available (one or more of the conservative values may have been used):

1. Where DRASTIC Index = D_R x D_W + R_R x R_W + A_R x A_W + S_R x S_W + T_R x T_W + I_R x I_W + C_R x C_W

- D (depth to ground water) – Use 10 (10 x 5[weight] = 50)
- R (recharge) - If the well is near a stream bed or is receiving mountain front recharge, use 9 (9 x 4[weight] = 36 as the "Most conservative". Otherwise use 6(6 x 4[weight] = 24
- A (aquifer media) – Use 10 (10 x 3[weight] = 30)
- S (soil media) – Use 10 (10 x 2[weight] = 20)
- T (Topography/slope) – Use 10 (10 x 1[weight] = 10)
- I (Impacts of the Vadose Zone) – If the well is in a limestone area, use 10 (10 x 5[weight] = 50). If the well is not in a limestone area, use 8 (8 x 5[weight] = 40.
- C (Hydraulic Conductivity) – Use 10 (10 x 4[weight] = 40

The equation:
DRASTIC (conservative) = (10 x 5) + (9 x 4) + (10 x 3) + (10 x 2) + (10 x 1) + (10 x 5) + (10 x 4) = 236
(If the lower values for R and I are used the result will be 214. Both of these results fall in the "High" range).

The Pesticide Index equation was used when calculating a DRASTIC Index for a well located in an area where crops and/or orchards were the predominant land use or when pesticide use was known.

2. Where DRASTIC Pesticide Index = D_R x D_W + R_R x R_W + A_R x A_W + S_R x S_W + T_R x T_W + I_R x I_W + C_R x C_W

- D (depth to ground water) – Use 10 (10 x 5[weight] = 50)
- R (recharge) - If the well is near a stream bed or is receiving mountain front recharge, use 9 (9 x 4[weight] = 36 as the "Most conservative". Otherwise use 6(6 x 4[weight] = 24
- A (aquifer media) – Use 10 (10 x 3[weight] = 30)
- S (soil media) – Use 10 (10 x 5[weight] = 50)
- T (Topography/slope) – Use 10 (10 x 3[weight] = 30)
- I (Impacts of the Vadose Zone) – If the well is in a limestone area, use 10 (10 x 4[weight] = 40). If the well is not in a limestone area, use 8 (8 x 4[weight] = 32
- C (Hydraulic Conductivity) – Use 10 (10 x 4[weight] = 40

The equation:
(10 x 5) + (9 x 4) + (10 x 3) + (10 x 5) + (10 x 3) + (10 x 4) + (10 x 4) = 276
(If the lower values for R and I are used the result will be 260. Both of these results fall in the "High" range).

If a screened interval is needed the conservative value used was <100 feet.

ROADS AND RELATED FEATURES

Roads on Provisional edition maps are not classified as primary, secondary, or light duty. They are all symbolized as light duty roads.

- Primary highway
- Secondary highway
- Light duty road
- Unimproved road
- Trail
- Dual highway
- Dual highway with median strip
- Road under construction
- Underpass; overpass
- Bridge
- Drawbridge
- Tunnel

VEGETATION

- Woods
- Scrub
- Orchard
- Vineyard
- Mangrove

CONTOURS

Topographic

- Intermediate
- Index
- Supplementary
- Depression
- Cut; fill

Bathymetric

- Intermediate
- Index
- Primary
- Index Primary
- Supplementary

BUILDINGS AND RELATED FEATURES

- Building
- School; church
- Built-up Area
- Racetrack
- Airport
- Landing strip
- Well (other than water); windmill
- Tanks
- Covered reservoir
- Gaging station
- Landmark object (feature as labeled)
- Campground; picnic area
- Cemetery: small; large

RAILROADS AND RELATED FEATURES

- Standard gauge single track; station
- Standard gauge multiple track
- Abandoned
- Under construction
- Narrow gauge single track
- Narrow gauge multiple track
- Railroad in street
- Juxtaposition
- Roundhouse and turntable

LAND SURVEY SYSTEMS

U.S. Public Land Survey System

- Township or range line
- Location doubtful
- Section line
- Location doubtful
- Found section corner; found closing corner
- Witness corner; meander corner

Other land surveys

- Township or range line
- Section line
- Land grant or mining claim; monument
- Fence line

RIVERS, LAKES, AND CANALS

- Intermittent stream
- Intermittent river
- Disappearing stream
- Perennial stream
- Perennial river
- Small falls; small rapids
- Large falls; large rapids
- Masonry dam
- Dam with lock
- Dam carrying road
- Perennial lake; Intermittent lake or pond
- Dry lake
- Narrow wash
- Wide wash
- Canal, flume, or aqueduct with lock
- Elevated aqueduct, flume, or conduit
- Aqueduct tunnel
- Well or spring; spring or seep

MINES AND CAVES

- Quarry or open pit mine
- Gravel, sand, clay, or borrow pit
- Mine tunnel or cave entrance
- Prospect; mine shaft
- Mine dump
- Tailings

DARIES

- ional
- e or territorial
- nty or equivalent
- l township or equivalent
- rporated city or equivalent
- k, reservation, or monument
- Small park

Appendix B

Water System Condition Table

Table 3-5. Summary of Present Condition and Deficiencies at Tank, Well, Booster Pump, and PRV Facilities.

Description	Size, Capacity & Description		Present Condition and Deficiencies
Tank 3 Site	0.5 MG steel tank located on the east side of I25 adjacent to Well #3. Tank built in 1969, refurbished in 1997. Booster pumps; 3-40 HP pumps; deliver water from Tank 3 to upper pressure zone or Tanks 5/6; main SCADA facility is on site		Chlorination-booster pump bldg. is sheet metal construction and shows evidence of rust and wear. Also, space is limited with inadequate room for maintenance and repairs. Tank overflow/drainage line causes leakage and damage to adjacent private property. Motor control centers are old and sometimes unreliable. Booster pumps are also old and inefficient. Two gate valves on discharge of boosters difficult to operate. Site needs detailed survey as basis for complete rehab.
Tank 4 Site	1.0 MG steel tank on east side of I25 adjacent to Well 4. Tank built in 1987, scheduled for interior painting soon; tank supplies water by gravity to lower pressure zone by gravity. PRV 6 on site in above ground fiberglass enclosure		Overall condition is good, though paint on well house exterior wall is peeling. 2010 inspection showed need for rehab and recoating of tank interior, exterior touch up coating, new cathodic protection system, locking security door on exterior ladder, and repair of cracks in concrete ring wall.
Tank 5/6 Site	Tank 5 is 1.0 MG steel; Tank 6 is 1.5 MG; built in 1994 and 2003, respectively; new building completed in 2007 has four-125 HP vertical turbine booster pumps to deliver water to Tank 7; also has Clortec hypochlorite generator and disinfection facitlity; tanks normally supply the upper pressure zone by gravity, but can also feed Tank 4 and middle zone if needed. Owing to slow development of Huning Ranch area, booster system has been operated much below capacity.		Inspection in 2010 showed need for rehab and recoating of tank interior, exterior touch up coating, replacement of concrete pad under freeze box on inlet/outlet pipe, sealing of roof penetrations, and adding security shroud on tank vent. Masonry building with overhead crane has good room for all facilities. Overall building condition is good.
Tank 7 Site	1.5 MG steel tank built in 2007; supplies a portion of the Huning Ranch pressure zone via PRV 9. Tank operated only 1/3 full because of low demand and need to avoid water age problems.		Overall condition is good. No major issues identified.
Well 3 -- at Tank 3 site: drilled 1969 to 605'; 75-HP submersible pump; TDH = 320'; 14" casing, 750 gpm capacity	Disinfection: Regal gas chlorinator; 4-150 lb gas cylinders (2 active, 2 standby); digital scale	Tonka Arsenic Removal System*	Pumps water to Tank 3. See comments for Tank 3 site above. Well 3 and all other wells need a water level measurement program to document static (winter) and drawdown water levels at beginning and end of high demand summer season.
Well 4 -- at Tank 4 site; drilled 1987 to 590'; 100HP submersible pump; TDH = 305'; 14" casing; 1055 gpm capacity.	Disinfection: Regal gas chlorinator; 4-150 lb gas cylinders (2 active, 2 standby); manual scale	Tonka Arsenic Removal System*	Pumps water to Tank 4 which supplies lower pressure zone. Insufficient pressure at times to run the backwash cycle of arsenic removal facilities. See comments for Tank 4 site above.
Well 5 -- at Tanks 5/6 site; drilled in 1996 to 700'; 300 HP lineshaft turbine pump; 1500 gpm capacity; feeds tanks 5/6 and upper pressure zone west of I25	Disinfection: Regal gas chlorinator; 4-150 lb gas cylinders (2 active, 2 standby); manual scale; includes standby generator to operate scrubber for gas chlorinator room.	Tonka Arsenic Removal System*	Overall condition is good, although on-site generator and gas scrubber is inoperative. Consider switching to hypochlorite generation system because of close proximity to nearby businesses.
Well 6 --south end of town just east of I25; drilled in 2003 to 660'; 150 HP; 150 HP submersible pump; TDH = 275'; 1400 gpm capacity.	Disinfection: ClorTec hypochlorite generation facility; 500 gal sodium hypochlorite tank with feed pump.	Tonka Arsenic Removal System*; booster pumps which are fed by 30,000 gal 'nurse' tank (2008 date) on site. Boosters are 2-150 HP horizontal split case, 252' TDH, 1500 gpm, that pump water to Tanks 5/6.	Masonry building has adequate room for all facilities. Overall condition is good. No major issues identified.
Pressure Reducing Station 1	Near Tank 3 in above ground enclosure. Downstream pressure = 58 psi		Good condition; check insulation, light and heat. Connect to SCADA system.
Pressure Reducing Station 2	Was on Main St. west of PRV 3; out of service		Abandoned
Pressure Reducing Station 3	At Main St. and High Line Canal in below-grade vault. Downstream pressure = 58 psi.		Difficult access and poor working room; needs to be rebuilt. Connect to SCADA system.
Pressure Reducing Station 4	West of I 25, north of and across from Well 6 in above ground enclosure. Downstream pressure = 60 psi.		Good condition; check insulation, light and heat. Connect to SCADA system.
Pressure Reducing Station 5	East of I 25 between Tanks 3 and 4 in above ground enclosure. Downstream pressure = 55 psi		Good condition; check insulation, light and heat. Connect to SCADA system.
Pressure Reducing Station 6	At Tank 4 site in above ground enclosure. Downstream pressure = 15 psi		Good condition; check insulation, light and heat. Connect to SCADA system.
Pressure Reducing Station 7	Just north of Huning Ranch Loop West in below-grade vault. Downstream pressure = 50 psi		Good access and good condition. Connect to SCADA system.
Pressure Reducing Station 8	South of Well 6 at 90 degree ben in 18" oin in below grade vault. Downstream pressure = 45 psi		Good condition; check insulation, light and heat. Connect to SCADA system.
Pressure Reducing Station 9	On 18" line below Tank 7 in below-grade vault. Downstream pressure = 28 psi.		Good access and good condition. Connect to SCADA system.

Appendix C

Sanitary Survey

State of New Mexico
ENVIRONMENT DEPARTMENT
1216 Mechem Drive, Suite 2
Ruidoso, New Mexico 88345
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SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

RYAN FLYNN
Cabinet Secretary

BUTCH TONGATE
Deputy Secretary

November 18, 2015

Ray Vigil– Administrative Contact
Los Lunas Water System
PO Box 1209
Los Lunas, NM 87031

RE: 2015 Sanitary Survey Report

Ray Vigil:

Enclosed is the Sanitary Survey Report for the Los Lunas water system, conducted October 20 & 21, 2015 by John Pijawka from the New Mexico Environment Department Drinking Water Bureau (DWB).

During the survey, no significant deficiencies were identified and 7 notes/recommendations were cited/observed.

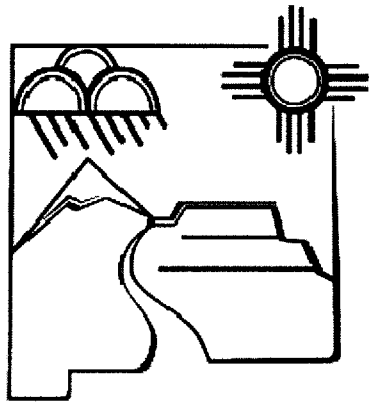
If you have any questions or need additional clarification concerning this report please call 575-258-3272 or e-mail john.pijawka@state.nm.us.

Respectfully,

John E. Pijawka
Compliance Officer, Ruidoso Area Office
Water Protection Division

Enclosures: Sanitary Survey Report
xc- Ruidoso Area Office file
Magneto system file

NMED
New Mexico Environment Department



SANITARY SURVEY REPORT

For

Los Lunas Water System
#253-32

Este informe contiene información importante acerca de su agua potable.
Haga que alguien lo traduzca para usted, o hable con alguien que lo entienda.

Prepared by:

New Mexico Environment Department
1216 Mechem Drive, Suite 2
Ruidoso NM 88345
575-258-3272

October 20 & 21, 2015

State of New Mexico
Environment Department
Drinking Water Bureau
1216 Mechem Drive, Suite 2
Ruidoso, New Mexico 88345

RECORD OF INSPECTION

This Sanitary Survey Report fulfills the requirements of NMAC 20.7.10.100 incorporating 40 C.F.R. 141.21(d) (ii) (2) and 142.16(o) (2) for completing a State approved survey. The information and data was prepared by John Pijawka, Compliance Officer.

NMED APPROVING AUTHORITY: _____ _____ Date: __October 20 & 21, 2015

Introduction

A sanitary survey enables the NMED Drinking Water Bureau Water (DWB) to provide a comprehensive and accurate review of the components of a water system, to assess the operating condition and adequacy of the water system, and to determine if past recommendations have been implemented effectively. The purpose of the sanitary survey is to evaluate and document the capabilities of the water system's sources, treatment, storage, distribution network, operation and maintenance, and overall management to ensure the provision of safe water. In addition, a sanitary survey provides an opportunity for the DWB to visit the water system and educate operators about proper monitoring and sampling procedures and to offer technical assistance. As part of a sanitary survey the (DWB) conducted a site inspection of the Los Lunas water system. The inspection was conducted by Compliance officer John Pijawka and Water Superintendent Ray Vigil and Operators Scott White and Charlie Owens. MEC TECH Project Coordinator Shelby Mangin and Compliance Nicole Mangin were also in attendance.

System Description

The Los Lunas water system is classified as a community water system according to the New Mexico Drinking Water Regulations 20.7.10 NMAC with a population of approximately 14,284 residents through 6205 connections and consists of 4 wells, 6 storage tanks, 3 Microchlor hypochlorination generating units, one gas chlorination unit, 2 booster pump stations and distribution. The 4 wells are capable of producing a total of approximately 5000 gallons total per minute. The storage tanks are bolted steel with a total capacity of 5,530,000 gallons. The storage tanks are plumbed both direct and to "float" on the system. The distribution network consists of a mix of ductile iron, asbestos and C 900 PVC piping.

Survey Findings

Sanitary surveys serve as a proactive public health measure and can provide important information on a water system's design and operations can identify minor and significant deficiencies for correction before they become major problems, and can improve overall system compliance. The following significant deficiency and recommendations were identified during the sanitary survey.

Significant Deficiencies:

A significant deficiency is defined as any deficiency that is causing, or has the potential to cause a threat to public health. NMAC 20.7.10.100 Incorporating 40 C.F.R. § 141.403(a) (4). Water systems must consult with the DWB within 30 days and take corrective action for any significant deficiencies found during the sanitary survey no later than 120 days after receiving written notification of such deficiencies, or be in compliance with a DWB-approved schedule and plan for correcting these deficiencies within the same 120 day period. NMAC 20.7.10.100 incorporating 40 C.F.R. § 141.403(a) (4) incorporating 40 C.F.R. §§ 141.403(a) (4), (a) (5) (i)-(ii). Failure to remedy any significant deficiency will result in a treatment technique violation of NMAC 20.7.10.100 incorporating 40 C.F.R. 141 Subpart S.

No significant deficiencies were identified at the Los Lunas Water System during the survey.

The following are violations/deficiencies/notes which DWB recommends be corrected before the next sanitary survey to ensure the deficiencies do not become significant.

1. It was noted and recommended that the current Operation & Maintenance and Emergency Response plans be updated as needed to include the Microclor generating hypochlorination systems, bacti sampling ports, sample sites and other updates since the 2012 survey.

2. It was noted that the Los Lunas water system started QUARTERY Arsenic sampling the 2nd QTR 2014. It is recommended that staff start recording the Running Annual Average (RAA) to determine when the arsenic sampling schedule could be put on TRIANNUAL and to verify with DWB.
3. It was noted that the Consumer Confidence Report (CCR) for 2016 will be due on MAY 18, 2016 due to the fact that Lead & Copper and Stage 2 DIBP violations were issued on May 18th & June 9th 2015 respectively. (Tier 3 violations – 365 days to post)
4. It is recommended that the Ground Water Source Tap (GWR) be down turned in the vault at well 3.
5. It is recommended at the well 5 arsenic treatment plant that the HCL gasket at the injector site near the static mixer be replaced since it has a leak.
6. The GWR sampling tap at well 6 is broken/missing. If a sample were needed to be taken, it could be compromised.
7. It is recommended that the overflows at storage tanks 5 & 6 be uncovered, they are partially buried.

CONCLUSION

The sanitary survey for the Los Lunas water system was completed on October 21, 2015. Based upon the onsite inspection and review of various operational and managerial documents and of DWB compliance files, no significant deficiencies were identified.

If you have any questions or need additional clarification concerning this report please call 575-258-3272 or e-mail john.pijawka@state.nm.us.

Appendix D

NMED List of Potential Sources of Contamination

APPENDIX D: POTENTIAL SOURCES OF CONTAMINATION

Map Code	Land Use	Description	Contaminants of Concern*
AGRICULTURAL LAND USE			
AAP	Animal Processing or Rendering Plants	Commercial Operations/Waste Storage/Disposal Facility	Nitrates, Pathogens, Organic/Inorganic Chemicals
ACS	Farm/Ranch Agrochemical Storage Facilities or Sites	Farm/Ranch Storage Site	Pesticides, Herbicides, Fertilizers
ADC	Drainage Canals, Ditches or Acequias-Unlined, Wells (Private, Stock wells, and Irrigation)	Runoff and Infiltration	Pesticides, Herbicides, Fertilizers, Nitrate, Pathogens
ADF	Livestock Production-Dairies	Livestock Wastes, Runoff and Infiltration	Nitrate, Phosphate, Chloride, Pathogens, Pharmaceuticals
AFI	Farming-Irrigated Croplands	Runoff and Infiltration	Nitrate, Ammonia, Chloride, Fertilizers, Pesticides, Herbicides
AFL	Confined Animal Feeding Operations	Runoff and Infiltration of Livestock Wastes	Nitrate, Phosphate, Chloride, Pathogens, Pharmaceuticals
AFM	Farm Machinery Storage or Maintenance Areas	Farm Machinery Maintenance Areas	Automotive Wastes, Welding Wastes, Fuels, Oils, Lubricants
AFN	Farming-Non-irrigated Croplands	Runoff and Infiltration Operations	Nitrate, Ammonia, Chloride, Fertilizers, Pesticides, Herbicides
AHC	Horticultural/Gardens/Nurseries/Greenhouses	Operations/Storage	Pesticides, Herbicides, Fertilizers
AHF	Hay/Feed and Veterinary Product Storage Sites	Farm/Ranch Storage Site	Fungicides, Pesticides, Nitrates, Pharmaceuticals
AMA	Manure or Livestock Waste-Land Application Areas	Land Application of Manure	Nitrate, Ammonia, Phosphate, Chloride, Pathogens, Pharmaceuticals
AMS	Manure or Livestock Waste-Storage Facilities or Sites	Lined and Unlined Manure Storage Facilities	Nitrate, Ammonia, Phosphate, Chloride, Pathogens, Pharmaceuticals
AOA	Livestock Production-Other Animal	Livestock Wastes	Nitrate, Ammonia, Phosphate, Chloride, Pathogens, Pharmaceuticals
APF	Livestock Production -Poultry	Poultry Sewage Wastes	Nitrate, Ammonia, Phosphate, Chloride, Pathogens, Pharmaceuticals
APP	Processing Plants or Mills- Hay, Grain, or Produce	Operations, Waste Storage and Disposal	Organic/Inorganic Chemicals, Lubricants, Machinery Wastes
ARL	Animal Rangeland	Rangeland and Pasturage	Nitrate, Ammonia, Phosphate, Chloride, Pesticides, Pathogens
ASC	Bulk Agrochemical Storage-Petroleum/Chemicals	Storage-500 gallons or more	Petroleum Products, Inorganic/Organic Chemicals
ASF	Bulk Agrochemical Storage-Fertilizers	Feed Mill, Agricultural Co-op	Fertilizers
ASG	Bulk Agricultural Product Storage-Grain or Produce	Grain Elevator, Warehouse or Storage Site	Fungicides, Oils, Lubricants, Machinery Wastes
ASH	Livestock Production -Sheep	Livestock Sewage Wastes	Nitrate, Ammonia, Phosphate, Chloride, Pathogens, Pharmaceuticals

APPENDIX D: POTENTIAL SOURCES OF CONTAMINATION

Map Code	Land Use	Description	Contaminants of Concern*
ASP	Bulk Agrochemical Storage-Pesticides	Feed Mill, Agricultural Co-op	Pesticides
ASW	Livestock Production -Swine	Livestock Sewage Wastes	Nitrate, Ammonia, Phosphate, Chloride, Pathogens, Pharmaceuticals
COMMERCIAL LAND USE			
CAI	Airports (Active/Inactive)	Operations/Maintenance/Construction	Aircraft Fuels, Deicers, Batteries, Diesel Fuel, Chlorinated Solvents, Automobile Wastes, Heating Oil, Building Wastes, Sewage, Septage, Pathogens, Pesticides, Fertilizers
CAR	Automotive Repair Shops	Operations/Maintenance/Storage	Solvents, Metals, Automotive Waste, Oils, Gasoline
CAW	Abandoned/Improperly Closed Wells	Storage/Disposal	Organic/Inorganic Chemicals, Brines, Waste Oil, Treated Sewage Effluent, Storm Water Runoff, Process Waste Water, Metals, Pathogens, Nitrate
CBS	Automotive Body Shops	Operations/Maintenance	Paints, Solvents
CBY	Boat Yards/Marinas	Operations/Maintenance	Gasoline, Diesel Fuels, Septage, Wood Treatment Chemicals, Paints, Varnishes, Automotive Wastes, Solvents, Building Wastes
CCG	Camp Grounds - Unsewered	Untreated Domestic Wastewater	Septage, Gasoline, Pesticides, Organic/Inorganic Chemicals
CCE	Cemeteries	Operations/Maintenance	Leachate, Arsenic, Pesticides, Fertilizers
CCW	Car Washes	Unsewered, Without Total Recycling System	Soaps, Detergents, Waxes, Organic/Inorganic Chemicals
CCY	Construction/Demolition Yard/Staging Areas	Storage/Maintenance	Gasoline, Diesel Fuels, Wood Treatment Chemicals, Paints, Varnishes, Automotive Wastes, Solvents, Building Wastes, Explosives, Oil
CDC	Dry Cleaning Shops	Operations/Maintenance	Chlorinated Solvents, Organic/Inorganic Chemicals
CFA	Fuel Storage Tanks-Above Ground	Non-Service Station Tanks	Gasoline, Diesel Fuel, Organic/Inorganic Chemicals
CFB	Fuel Storage Tanks-Below Ground	Non-Service Station Tanks	Gasoline, Diesel Fuel, Organic/Inorganic Chemicals
CFC	Funeral Homes/Crematories	Operations	Biohazard Waste, Organic/Inorganic Chemicals, Septage
CFR	Furniture Repair/Refinishing	Operations	Paints, Solvents, Organic Chemicals
CGC	Golf Courses	Operations/Maintenance	Fertilizers, Pesticides, Gasoline, Automotive Wastes, Batteries, Septage
CHG	Historic Gasoline Service Stations	Above/Below Ground Storage Tanks/Operations	Gasoline, Oils, Solvents, Automotive Wastes, Septage
CHM	Home Manufacturing	Operations/Maintenance/Storage	Paints, Solvents, Organic/Inorganic Chemicals

APPENDIX D: POTENTIAL SOURCES OF CONTAMINATION

Map Code	Land Use	Description	Contaminants of Concern*
CHN	Hospitals/Nursing Homes - Unsewered	Wastewater Discharge to Septic Tank/Leach Field	Biohazard Waste, Organic/Inorganic Chemicals, Septage, Radiological Waste
CHW	Hardware/Lumber/Parts Stores	Operations/Storage	Pesticides, Fertilizers, Organic/Inorganic Chemicals
CLD	Laundromats - Unsewered	Wastewater Discharge	Detergents, Soaps, Septage
CPP	Photo Processing Laboratories	Operations/Storage	Organic/Inorganic Chemicals
CPR	Printing Shops	Operations/Storage	Solvents, Inks, Dyes, Organic/Inorganic Chemicals
CPS	Paint Stores	Storage	Paint, Solvents
CRL	Research Laboratories	Operations/Maintenance/Storage	Biohazard Waste, Radiological Materials and Waste, Metals, Organic/Inorganic Chemicals
CRY	Railroad Yards and Tracks	Operations/Maintenance/Storage	Diesel Fuel, Pesticides, Organic/Inorganic Chemicals
CSS	Gasoline Service Stations	Above/Below Ground Storage Tanks/Operations	Gasoline, Oils, Solvents, Automotive Wastes, Septage
CST	Commercial Septic Tanks/Leachfields/Leachpits/Cesspools	Storage/Disposal	Septage, Septic Effluent, Pathogens, Nitrate, Ammonia, Chloride
CVS	Veterinary Facilities	Operations/Maintenance	Biohazard Waste, Organic/Inorganic Chemicals, Septage, Radiological Waste
INDUSTRIAL LAND USE			
IAS	Asphalt Plants	Production/Storage	Petroleum Derivatives
ICC	Cement/Concrete Plants	Operations/Maintenance/Storage	Organic/Inorganic Chemicals, Oils, Natural Gas, Propane,
ICE	Communications Equipment Manufacturers	Production/Maintenance/Storage	Solvents, Organic/Inorganic Chemicals, Oils, Waste Oils, Metals
ICL	Chemical Landfills	Storage/Disposal	Leachate of Organic/Inorganic Chemicals, Acids, Bases, Metals, Solvents, Gasoline, Diesel Fuel, Pesticides, PCB's
ICP	Chemical Production Plants	Production/Maintenance/Storage	Organic/Inorganic Chemicals, Solvents, Oils, Metals
IEE	Electronic/Electrical Equipment Manufacturers	Production/Maintenance/Storage	Solvents, Organic/Inorganic Chemicals, Oils, Waste Oils, Metals, Acids, Bases
IFM	Furniture and Fixture Manufacturers	Production/Maintenance/Storage	Paints, Solvents, Organic/Inorganic Chemicals
IFW	Foundry/Smelting Plants	Production/Maintenance/Storage	Organic/Inorganic Chemicals, Metals, Solvents, Acids, Bases, Oils

APPENDIX D: POTENTIAL SOURCES OF CONTAMINATION

Map Code	Land Use	Description	Contaminants of Concern*
IGO	Gas/Oil Wells-Active/Abandoned/Test, Wells Geothermal and Industrial	Production	Oil, Natural Gas, Organic/Inorganic Chemicals, Acids, Bases, Drilling Wastes
IHD	Historic Dumps/Landfills	Storage/Disposal	Leachate of Organic/Inorganic Chemicals, Acids, Bases, Metals, Solvents, Gasoline, Diesel Fuel, Pesticides, PCB's, Automotive Wastes
IHM	Historic Mining Operations	Production Waste/Storage	Metals, Inorganic Chemicals, Acids, Bases, Radiological Materials
IMI	Primary Metal Industries	Steel/Metal Works, Rolling/Wire Mills	Metals, Inorganic Chemicals, Acids, Bases
IMO	Mining Operations (Surface And Subsurface)	Production Waste/Storage	Metals, Inorganic Chemicals, Acids, Bases, Radiological Materials
IMP	Metal Plating/Processing Facilities	Operations/Maintenance/Storage	Organic/Inorganic Chemicals, Acids, Bases, Metals
IMW	Machine/Metal Working Shops	Operations/Maintenance/Storage	Cutting Oils, Metals, Solvents, Organic/Inorganic Chemicals, Detergents
IOG	Oil/Gas Pipelines	Transport	Oils, Gasoline, Volatile Organic Chemicals, Natural Gas, Propane
IPL	Plastics Manufacturing/Molder	Operations/Maintenance/Storage	Solvents, Oils, Organic/Inorganic Chemicals, Acids, Bases
IPM	Paper Mills	Operations/Maintenance/Storage	Acids, Metals, Organic/Inorganic Chemicals
IPP	Petroleum Production/Refining/ Bulk Plants	Operations/Maintenance/Storage	Oils, Gasoline, Diesel Fuels, Organic Chemicals, Oil Drilling/Refining Wastes
IPU	Public Utilities	Power Generating Stations	PCB's, Solvents, Diesel Fuel, Propane, Natural Gas, Oil, Acids, Bases, Organic/Inorganic Chemicals, Metals
IRG	RCRA Waste Generators - Other	Storage/Disposal	Organic/Inorganic Chemicals, Solvents, Metals, PCB's, Acids, Bases, Radiological Materials
IRW	Radioactive Waste Disposal Sites	Storage/Disposal	High and Low Level Radiological Wastes
ISD	Sumps/Dry Wells	Storage/Disposal	Storm Water Runoff, Organic/Inorganic Chemicals, Solvents, Process Wastewater, Pesticides, Oils
ISF	Superfund Sites	Storage/Disposal	Organic/Inorganic Chemicals, Solvents, Metals, PCB's, Acids, Bases, Radiological Materials
ISM	Primary Wood Industries	Saw Mills, Planers, Wood Treatment	Organic/Inorganic Chemicals, Metals, Solvents
IST	Stone, Tile, Glass Manufacturing	Operations/Maintenance/Storage	Solvents, Oils, Metals, Organic/Inorganic Chemicals
ITS	Treatment/Storage/Disposal Ponds/Lagoons	Treatment/Storage	Organic/Inorganic Chemicals, Metals, Acids, Bases, Sewage
ITT	Transport/Distribution, Warehouses, Truck Terminals	Operations/Maintenance/Storage	Gasoline, Diesel Fuels, Automotive Wastes, Metals, Organic/Inorganic Chemicals, Acids, Bases
IUD	Unregulated Dumps/Excavated Sites, Snow Dumps	Storage/Collection/Disposal	Organic/Inorganic Chemicals, Automotive Wastes, Oil, Gasoline, Runoff from Adjacent Sites

APPENDIX D: POTENTIAL SOURCES OF CONTAMINATION

Map Code	Land Use	Description	Contaminants of Concern*
IUI	Underground Injection (UIC) Wells	Storage/Disposal	Organic/Inorganic Chemicals, Brines, Waste Oil, Treated Sewage Effluent, Storm Water Runoff, Process Wastewater, Metals, Pathogens, Nitrate
IUR	Utility/Transportation Right of Ways, major transportation corridor	Power Lines, Gas/Oil Pipelines	Pesticides, Gasoline, Diesel Fuels, Automotive Wastes, Organic/Inorganic Chemicals, PCB's, Sewage, Metals, Storm water Runoff, Pathogens
MUNICIPAL/RESIDENTIAL LAND USE			
MHM	Highway/Road Maintenance Yards	Operations/Maintenance/Storage	Gasoline, Diesel Fuels, Solvents, Road Salt, Asphalt, Pesticides, Automotive Wastes,
MHR	Highway Rest Areas	Operations/Maintenance/Storage/Disposal	Automotive Wastes, Septage, Gasoline, Diesel Fuels, Pesticides
MIN	Incinerators - Commercial or Municipal	Operations/Disposal	Metals, Organic/Inorganic Chemicals
MLF	Municipal Waste Landfills	Storage/Disposal	Leachate, Organic/Inorganic Chemicals, Pesticides, Metals, Oils
MMF	Military Facilities	Operations/Maintenance/Storage/Disposal	Gasoline, Aircraft Fuels, Diesel Fuels, Automotive Wastes, Metals, Organic/Inorganic Chemicals, Explosives, Radiological Materials, Pesticides, Sewage/Septage, Oils, Solvents, Fertilizers, Batteries, Deicers
MMP	Motor Pools	Operations/Maintenance/Storage/Disposal	Gasoline, Diesel Fuel, Oils, Waste Oils, Automotive Waste, Batteries, Metals
MPS	Sewage Pump Stations	Operations/Storage	Sewage, Pathogens, Nitrate, Metals, Organic/Inorganic Chemicals
MPW	Polluted Surface Water Sources	Naturally Occurring/Anthropogenic	Sewage, Pathogens, Nitrate, Metals, Acids, Bases, Organic/Inorganic Chemicals
MRF	Recycling Facilities	Operations/Storage/Disposal	Metals, Organic/Inorganic Chemicals, Pesticides, Automotive Wastes, Oils
MSC	Schools – Unsewered	Wastewater Discharge to Septic Tank/Leach Field	Septage, Septic Effluent, Pathogens, Nitrate, Ammonia, Chloride
MSD	Storm Drainage Collection Areas or Outlets-Unlined	Storage/Disposal	Runoff, Pesticides, Fertilizer, Pathogens, Nitrate, Phosphate, Oil
MSL	Sewer Lines	Transport	Sewage, Pathogens, Nitrate, Metals, Organic/Inorganic Chemicals
MSP	Wastewater Seepage/Retention Ponds (Unlined/Lined)	Storage/Disposal	Sewage Effluent, Nitrate, Ammonia, Pathogens, Organic/Inorganic Chemicals, Pesticides
MSS	Sewage Effluent/Sludge Land Application Areas	Storage/Disposal	Sewage/Sewage Sludge, Nitrate, Pathogens, Organic/Inorganic Chemicals, Metals
MST	Sewage Treatment Plants	Operations/Maintenance/Storage/Disposal	Sewage, Sewage Sludge, Metals, Pathogens, Organic/Inorganic Chemicals
MSW	Solid Waste Transfer Stations	Storage/Disposal	Metals, Organic/Inorganic Chemicals, Pesticides, Automotive Wastes, Oils
MWP	Water Treatment Plants and Water Supply Wells	Operations/Maintenance/Storage/Disposal	Organic/Inorganic Chemicals, Chlorine

APPENDIX D: POTENTIAL SOURCES OF CONTAMINATION

Map Code	Land Use	Description	Contaminants of Concern*
RSF	Single Family Residences - Unsewered	Wastewater Discharge to Septic Tank/Leach Field or Cesspool	Septage, Pathogens, Nitrate, Ammonia, Chloride, Heavy Metals, Household Pesticides, Herbicides, Cleaning Agents and Solvents, Fuels
* Contaminants of Concern include substances that are commonly, but not always, associated with the Contaminant Source listed in column 2			

Appendix E

Sampling Schedules

New Mexico Environment Department	UOCP Operator Lookup	Drinking Water Program
County Map of NM	Water System Search	Help

Water System Detail Information

Water System No.:	NM3525332	Federal Type:	C
Water System Name:	LOS LUNAS WATER SYSTEM	Federal Source:	GW
Principal County Served:	VALENCIA	System Status:	A
Principal City Served:	LOS LUNAS	Activity Date:	06-01-1977

Expanded Sample Schedules / FANLs / Plans

Routine TCR Sample Schedules

Begin/End Date	Seasonal Period	Requirements
07-01-2009 - Continuous	1/1 - 12/31	15 RT/MN
01-01-1991 - 06-30-2009	1/1 - 12/31	10 RT/MN

RP TCR Schedules From [ ] **To** [ ] SEARCH

Repeat TCR Sample Schedules

Begin Date	End Date	Requirements	Original Sample ID/Date

GWR Triggered Source Sample Schedules (Last 6 Months)

Facility	Schedule	Begin Date	End Date	Initial MP Begin Date

GWR Follow-up Triggered Source Sample Schedules (Last 6 Months)

Facility	Schedule	Begin Date	End Date

Group Non-TCR Sample Schedules

Facility	Begin End Date	Seas.	Init. MP Begin Dt	Req's	Analyte Group
25332000	10-01-2013 Continuous	10/1 10/31	10-01-2013	4 RT/QT	DBP2 - DBP STAGE 2
25332000	01-01-2008 Continuous	6/1 9/30	01-01-2008	20 RT/3Y	PBCU - LEAD AND COPPER
25332003	01-01-2014 12-31-2016		01-01-2014	1 RT/3Y	HM - HEAVY METALS
25332003	01-01-2017 Continuous		01-01-2017	1 RT/3Y	HM - HEAVY METALS
25332003	01-01-2008 Continuous		01-01-2008	1 RT/6Y	NRAD - NEW RAD RULE
25332003	01-01-2020 Continuous		01-01-2020	2 RT/3Y	RSOC - REGULATED SOCS

25332003	01-01-2014 12-31-2016		01-01-2014	1 RT/3Y	RSOC - REGULATED SOCS
25332003	01-01-2002 Continuous		01-01-2002	1 RT/3Y	VOC1 - VOLATILE ORGANICS
25332004	01-01-2017 Continuous		01-01-2017	1 RT/3Y	HM - HEAVY METALS
25332004	01-01-2014 12-31-2016		01-01-2014	1 RT/3Y	HM - HEAVY METALS
25332004	01-01-2008 Continuous		01-01-2008	1 RT/6Y	NRAD - NEW RAD RULE
25332004	01-01-2014 12-31-2019		01-01-2014	1 RT/3Y	RSOC - REGULATED SOCS
25332004	01-01-2020 Continuous		01-01-2020	2 RT/3Y	RSOC - REGULATED SOCS
25332004	01-01-2002 Continuous		01-01-2002	1 RT/3Y	VOC1 - VOLATILE ORGANICS
25332005	01-01-2017 Continuous		01-01-2017	1 RT/3Y	HM - HEAVY METALS
25332005	01-01-2011 12-31-2016		01-01-2011	1 RT/3Y	HM - HEAVY METALS
25332005	01-01-2008 Continuous		01-01-2008	1 RT/6Y	NRAD - NEW RAD RULE
25332005	01-01-2020 Continuous		01-01-2020	2 RT/3Y	RSOC - REGULATED SOCS
25332005	01-01-2014 12-31-2019		01-01-2014	1 RT/3Y	RSOC - REGULATED SOCS
25332005	01-01-2002 Continuous		01-01-2002	1 RT/3Y	VOC1 - VOLATILE ORGANICS
25332009	01-01-2011 Continuous		01-01-2011	1 RT/3Y	HM - HEAVY METALS
25332009	01-01-2008 Continuous		01-01-2008	1 RT/6Y	NRAD - NEW RAD RULE
25332009	01-01-2014 12-31-2019		01-01-2014	1 RT/3Y	RSOC - REGULATED SOCS
25332009	01-01-2020 Continuous		01-01-2020	2 RT/3Y	RSOC - REGULATED SOCS
25332009	01-01-2005 Continuous		01-01-2008	1 RT/3Y	VOC1 - VOLATILE ORGANICS

Individual Non-TCR Sample Schedules

Facility	Begin End Date	Seas	Init MP Begin Dt	Req.	Analyte
25332003	01-01-2002 Continuous		01-01-2002	1 RT/3Y	1024-CYANIDE
25332003	01-01-2002 Continuous		01-01-2002	1 RT/3Y	1025-FLUORIDE
25332003	01-01-2002 Continuous		01-01-2002	1 RT/YR	1038-NITRATE-NITRITE
25332004	01-01-2002 Continuous		01-01-2002	1 RT/3Y	1024-CYANIDE
	01-01-2002				

25332004	Continuous		01-01-2002	1 RT/3Y	1025-FLUORIDE
25332004	01-01-2002 Continuous		01-01-2002	1 RT/YR	1038-NITRATE-NITRITE
25332005	01-01-2002 Continuous		01-01-2002	1 RT/3Y	1024-CYANIDE
25332005	01-01-2002 Continuous		01-01-2002	1 RT/3Y	1025-FLUORIDE
25332005	01-01-2002 Continuous		01-01-2002	1 RT/YR	1038-NITRATE-NITRITE
25332009	01-01-2002 Continuous		01-01-2002	1 RT/3Y	1024-CYANIDE
25332009	01-01-2002 Continuous		01-01-2002	1 RT/3Y	1025-FLUORIDE
25332009	01-01-2004 Continuous		01-01-2004	1 RT/YR	1038-NITRATE-NITRITE

Facility Analyte Levels(FANLS)

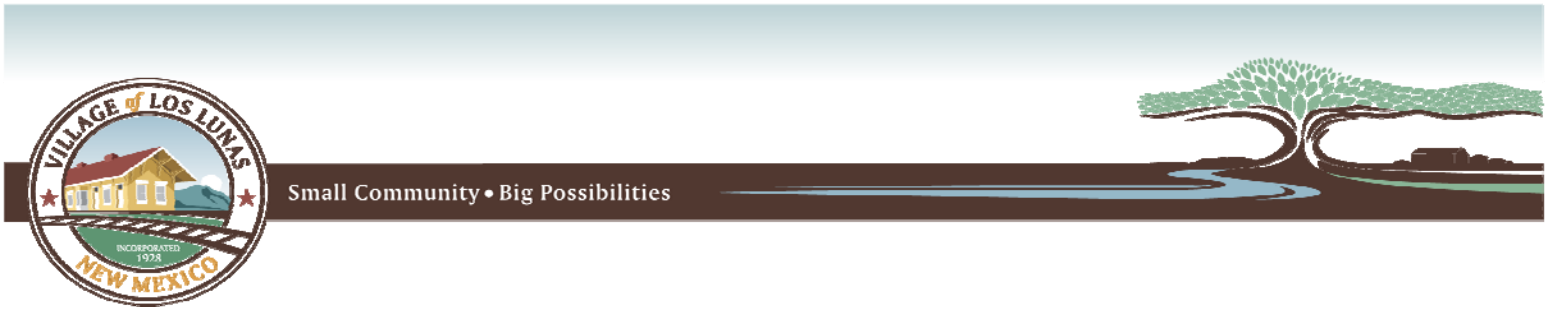
Site	Analyte	Level Type	Value	Units	Days/Month	Samples/Day	Begin Date	End Date	MDBP Type
25332000	0999	MAX	4.0	MG/L	0	0	01-01-2011	Continuous	MRDL

Sample Plans

Rule	Analyte/Analyte Group	Eff. Begin	Eff. End	App. Date	For Comp.

Appendix F

Emergency Response Plan



VILLAGE OF LOS LUNAS

Potable Water System Emergency Response Plan

CIRCULATION

The following persons are to receive copies of this Plan and all amendments:

Organization	Name	Position
Village of Los Lunas	Michael Jaramillo	Public Works Director
Village of Los Lunas	Ray R Vigil	Water/Sewer Superintendent
Village of Los Lunas		Water/Sewer Supervisor
Village of Los Lunas	Janice Byrnes	Utility Division Billing Supervisor
Molzen-Corbin & Associates	Clayton Ten Eyck, P.E.	Vice President - Water Resources Engineer
Mec-Tec Services	Nicole Mangin	Village's Consultant
New Mexico Environment	John Pijawka	Compliance Officer
Village of Los Lunas	Gregory Martin	Village Administrator

AMENDMENTS

Date	Section # Amended	Revision #	Reason for Amendment	Amended by (Initials)	Amendment Circulated Date

TABLE OF CONTENTS

APPENDICES

1.0 INTRODUCTION

Plan Background

Operating and maintaining the water supply, treatment and distribution system is a responsibility that involves consideration for routine functions, planning and responding to emergency situations. The purpose of this plan is to assist the Village of Los Lunas in preparing for and responding to emergency situations within their potable water system. For the purposes of this plan, an emergency is defined as *the occurrence of any event that causes the water system to pose a threat to public health and safety or to the environment.*

This document contains contacts, procedures, a water system map, and other information required to effectively respond to a set of pre-identified emergencies. The emergencies have been grouped into common categories. All questions or comments regarding this plan should be directed to the Public Works Director.

Emergency procedures have been prepared for 14 potential situations. These situations cover most emergencies that will be encountered. In situations where other emergencies arise, the general approach and principals illustrated here within should be adapted to address the situation.

As with any other emergency document, this plan's effectiveness can only be measured in a simulated emergency response. Therefore, each procedure should be reviewed and, if possible, tested on a yearly basis and revisions made as necessary.

Water System Background

Appendix A contains a schematic of the distribution system and a schematic of the water treatment process.

Ground Water Supply System

The Los Lunas Water System consists of wells that pump to ground storage tanks, which supply water to the system by gravity. The tanks are connected to users throughout the service area through a network of pipes ranging in size from 6 inches to 20 inches in diameter.

Three pressure zones exist within the service area. Areas west of Interstate 25 are in the upper pressure zone. Areas east of Interstate 25 to the valley floor (Hwy 314) are included in the middle pressure zone and the valley floor represent the lower pressure zone. There are seven pressure reducing valves (PRVs) in the system that define the three pressure zones and also control pressure in specific areas within a pressure zone. While the PRVs control pressure, the system has been constructed so that water stored in the ground storage tanks can flow by gravity to serve areas in lower elevations or be pumped to serve areas in higher elevations. For instance, water from the Tiger Tank, which is located in the middle pressure zone, can be pumped through the adjacent booster station to fill Tanks 5 and 6 that are located in the upper pressure zone

Treatment and Distribution System

The Village of Los Lunas has Four Arsenic Treatment plants, which includes coagulation, filtration, chlorine disinfection and granular activated carbon filtration. Raw water, filtered water and finished water are regularly tested in the treatment plant for pH, chlorine residual, Arsenic, and Iron.

Well 3, with a capacity of 875 gpm, pumps into Tank 3, which is located adjacent to the well. Tank 3, known locally as the Tiger Tank, is a 500,000 gallon tank which feeds the middle and lower pressure zones by gravity. The booster pump station adjacent to the tank pumps water from Tank 3 to Tanks 5 and 6 in the upper pressure zone. A pressure reducing station, located on the Well 3 site, allows water from the upper pressure zone to feed the middle pressure zone.

Well 4, is located east of 1-25 has a capacity of 1,190 gpm and supplies Tank 4 located adjacent to the well. Tank 4 is a 1,000,000 gallon tank located in the middle pressure zone that supplies much of the northern part of the Village by gravity.

Well 5, feeds directly to the upper pressure zone in the system. Well 5 is the greatest capacity well in the system with a capacity of 1,528 gpm. Well 5 pumps directly into the system and supplies Tanks 5 and 6.

Well 6 has a capacity of 1,400 gpm and supplies a 30,000-gallon storage tank at the Well 6 site. A booster pump station pumps water from this small tank directly to the upper pressure zone in the distribution system. Well 6 is considered a direct supply to the system.

Tanks 5 and 6 are connected directly to the distribution system. Tank 5 is a 1,000,000 gallon tank and Tank 6 has a capacity of 1,500,000 gallons. These two tanks are adjacent to each other and are used for storage, emergency water, and fire protection, and they can supply the Well 4 service area via the North Water Loop, which may be done if Well 4 is taken out of service. The tanks fill or empty depending on the tank levels and on the distribution system pressure.

Tank 7, with a storage capacity of 1,500,000 gallons, is the newest storage tank in the system. It was constructed in 2007, and is supplied with water from a new booster station taking water from Tanks 5 & 6. Tank 7 supplies the upper pressure zone.

Monthly distribution sampling and analysis, conducted at fifteen locations throughout the Village, ensures compliance with the *Drinking Water Protection Act*.

Components of Emergency Response

There are several components that make up an emergency response: gaining an understanding of the emergency, emergency response, contacting appropriate parties and the follow up action. Every Water/Sewer employee should be aware of these components, given that anyone may be the first to be notified or come upon an emergency situation. Being familiar with an organized approach may save precious time.

Gaining an Understanding of the Emergency

The Village will most likely be made aware of a potential emergency situation through phone calls from concerned citizens or from Village staff during routine maintenance checks. The Water/Sewer staff member who becomes aware of a potential emergency should make a primary assessment of the situation. The assessment is not to determine a remedy, but rather to determine the magnitude of the problem. A decision can then be made as to whether an emergency response or routine maintenance is required.

Emergency Response

Once an emergency has been triggered, the emergency plan for the specific situation should be implemented. All personnel should be familiar with their responsibilities and required actions during an emergency.

Contact Appropriate Parties

One of the first steps, should an emergency event occur, is to re-affirm the roles and establish clear lines of communication. In an emergency various people and organizations need to be contacted. Appendix B includes emergency contact information.

Follow Up Actions

Following control of the emergency, the clean up or repair may begin. Because the possible causes and thus remedies of an emergency are numerous, it is beyond the scope of the manual to describe specific repair procedures. It is likely that most repair procedures required of Water/Sewer staff will be within the scope of their regular training. Depending on the cause and extent of the emergency, advice and direction from the Water/Sewer Superintendent should be obtained.

There are, however, important actions that should be taken that are dependent on the type of emergency event. These actions may involve:

- conducting appropriate reporting to the Village and in some occurrences to regulatory agencies;
- updating maintenance records;
- Determining cause of failure and taking steps to preclude a similar emergency from happening.

2.0 EMERGENCY SITUATIONS AND ACTION PLANS

A: Water Supply

Emergency Event:	**A1 REDUCTION OR LOSS OF WATER SOURCE**
Emergency Triggers:	• Pump malfunction • Booster pump malfunction • Loss of system pressure
Risks:	• Fire flow supply • Public inconvenience

Actions Required:

- Investigate cause(s) of emergency event
- Contact Water/Sewer Superintendent and obtain confirmation of next steps
- Advise other mandatory contacts

Discretionary Actions:

- Lock out well
- Well 4 open north loop
- Well 5 turn on boosters at well 3
- Well 6 turn on boosters at well 3
- Well 3 open valve to fill tank with Well 4

Mandatory Contacts:

- Water/Sewer Superintendent
- Water/Sewer Supervisor
- Distribution Maintenance Operator
- Production Maintenance Operator
- Public Works Director
- Utility Billing Division

Optional Contacts:

- John E. Pijawka Compliance Officer New Mexico Environment Department

Follow Up Actions Required:

- Written report (internal to Village)

Emergency Event:	A2 MAJOR FIRE FLOW CONDITION
Emergency Trigger:	• Loss of system pressure • Low reservoir alarm • Communications from Fire Department
Risks:	• Fire flow supply • Public inconvenience • Potential backflow contamination

Actions Required:

- Advise Water/Sewer Superintendent of situation
- Contact Fire Department regarding estimated usage and expected duration

Discretionary Actions:

- Acknowledge alarms
- Starting pumps as per standard procedures
- Redirect water to affected area

Mandatory Contacts:

- Water/Sewer Superintendent
- Water/Sewer Supervisor
- Distribution Maintenance Operator
- Production Maintenance Operator
- Fire Department

Optional Contacts:

- Public Works Director
- Utility Billing Division
- Affected Users

Follow Up Actions Required:

- Written report (internal to Village)

Emergency Event:	A3 DISTRIBUTION WATER MAIN BREAK
Emergency Trigger:	• Any distribution water main break
Risks:	• Contamination / Health • Fire flow supply • Environmental / Property Damage • Public inconvenience

Actions Required:

- Isolate break
- Contain water discharge
- Advise Fire Department and Water/Sewer Superintendent
- Notify affected users and priority customers of service interruption
- Make necessary repairs utilizing approved methods and procedures
- Ensure adequate chlorine residuals after completion of repairs prior to returning to service

Discretionary Actions:

- Arrange alternate source of water if necessary: temporary connections, bottled water, water haul truck, etc.

Mandatory Contacts:

- Water/Sewer Superintendent
- Water/Sewer Supervisor
- Distribution Maintenance Operator
- Production Maintenance Operator
- Affected Users
- Fire Department

Optional Contacts:

- Public Works Director
- Utility Billing Division

Follow Up Actions Required:

- Flush repaired main until flow runs clear (minimum 3 water changes).
- Take water sample downstream of break after repairs are completed.
- Update maintenance records with details of the water main break (sample repair form contained in Appendix E).
- Written report (internal to Village).
- Written report to NMED, if necessary.

B: Water Quality

Emergency Event:	**B1 FAILED WATER TEST**
Emergency Trigger:	• Water quality tests for Total Coliform
Risks:	• Contamination / Health

Actions Required:

- Advise mandatory contacts
- Retakes one upstream one downstream and original site
- Notify NMED

Discretionary Actions:

- Re-sample water to ensure accurate results
- Flush suspected mains. Isolate mains to ensure uni-directional flush.
- Re-sample after flushing

Mandatory Contacts:

- Water/Sewer Superintendent
- Water/Sewer Supervisor
- Distribution Maintenance Operator
- Production Maintenance Operator
- Public Works Director

Optional Contacts:

- Utility Billing Division

Follow Up Actions Required:

- Increased water quality testing in area if needed
- Investigate cause of failed water test
- Written report (internal to Village)

Eme	B2 SUSPECTED CONTAMINATED WATER DISTRIBUTION SYSTEM
Emer	Any system component failure that gives suspicion of possible water system contamination or cross connection Vandalism or unauthorized access into reservoir Water main break where surrounding substances may have entered into the water system Notification that contamination may have occurred
Risks	Contamination / Health

Actions Required:

- Advise Water/Sewer Superintendent of situation to determine appropriate response
- Contact NMED to determine if public notification should be given
- Notify Village staff and advise of situation
- Advise other mandatory contacts
- Investigate contamination source and attempt to mitigate
- If location of Suspected Contaminated Water is within the City distribution system:
  - Flush suspected main and/or service connection. Isolate main to ensure directional flush.
  - Take water samples at nearest downstream sampling station and at closest cold water service. When water is sampled from the service, ensure that the tap has run long enough for sampling of water within the main. Test for residual chlorine.
  - If water tests fail then follow Failed Water Test procedure (B1)
- If location of Suspected Contaminated Water is within reservoir or pump station:
  - Take one sample from the reservoir and at least two within the distribution system. Send off for laboratory analysis for the suspected parameters.
  - Isolate reservoir or shut down the pump station until the results are received.
  - If water tests fail then follow Failed Water Test procedure (B1).

Discretionary Actions:

Contact Mec Tec services for sampling

Mandatory Contacts:

- Water/Sewer Superintendent
- Water/Sewer Supervisor
- Distribution Maintenance Operator
- Production Maintenance Operator
- Public Works Director

Cont'd on next page. . .

Optional Contacts: • Affected Users Fire Department
Follow Up Actions Required: • Detailed written report (internal to Village) • Written report to external agencies (NMED)

Emergency Event:	**B3 VANDALISM OF WATER SYSTEM**
Emergency Trigger:	• Any vandalism to any component of the water system
Risks:	• Contamination / Health

Actions Required: • Determine if contamination may have contaminated water system • If potential contamination, follow Suspected Contaminated Water Procedures B2
Discretionary Actions: • If criminal activity is suspected, contact LLPD
Mandatory Contacts: • Water/Sewer Superintendent • Water/Sewer Supervisor • Distribution Maintenance Operator • Production Maintenance Operator • Public Works Director • Utility Billing Staff
Optional Contacts: • NMED • Fire Department
Follow Up Actions Required: • Written report (internal to Village) • Written report to external agencies (NMED) if required

Emergency Event:	B4 Chemical Spill/Chlorine Release
Emergency Trigger:	• Any waste spill in the vicinity of any portion of the water system
Risks:	• Contamination / Health • Environmental

Actions Required:

- Immediately notify Municipal staff and Water/Sewer Superintendent
- Determine if spill may have contaminated water system
- If potential contamination, follow Suspected Contaminated Water Procedures B2

Discretionary Actions:

- Contact Affected Users around site

Mandatory Contacts:

- Water/Sewer Superintendent
- Water/Sewer Supervisor
- Distribution Maintenance Operator
- Production Maintenance Operator
- Public Works Director
- Utility Billing Staff
- Fire Department
- NMED

Optional Contacts:

- Village Administrator

Follow Up Actions Required:

- Written report (internal to Village)
- Written report to external agencies (NMED)

C: Equipment Failure

Emergency Event:	**C1 SUPPLY PUMPING FAILURE**
Emergency Trigger:	• Electrical loss or malfunction • Damage to pump house (fire, vehicular accident) • Equipment failure
Risks:	• Fire flow supply • Public inconvenience • Reduced raw water storage capacity • Reduced raw water pumping capacity

Actions Required:

- Investigate cause(s) of emergency event
- Contact Water/Sewer Superintendent and obtain confirmation of next steps
- Investigate failure, determine cause and appropriate repairs required
- Arrange for necessary repair works

Discretionary Actions:

- Lock out well
- Well 4 open north loop
- Well 5 turn on boosters at well 3
- Well 6 turn on boosters at well 3
- Well 3 open valve to fill tank with Well 4

Mandatory Contacts:

- Water/Sewer Superintendent
- Water/Sewer Supervisor
- Distribution Maintenance Operator
- Production Maintenance Operator
- Public Works Director
- Utility Billing Division

Optional Contacts:

- John E. Pijawka Compliance Officer New Mexico Environment Department

Follow Up Actions Required:

- Written report (internal to Village)

Emergency Event:	C2 LOSS ARSENIC TREATMENT CAPACITY
Emergency Trigger:	• Equipment failure • Tank structural failure • SCADA Alarm
Risks:	• Public inconvenience • Fire flow supply • Loss of treated water supply

Actions Required:

- Advise Water/Sewer Superintendent of situation to determine appropriate response
- Contact Fire Department regarding reduced fire flow supply
- If equipment / structural failure impacts the delivery of safe drinking water or safe plant operation:
  - Shut down water treatment plant
  - Initiate repair work request on a high priority basis
  - If possible, obtain cost estimate on repair prior to authorizing work
  - If suspected contamination of the water supply has occurred then follow the Suspected Contaminated Water Procedure (B3)
  - Restart plant once repairs are complete
- If failure does not impact the delivery of safe drinking water then:
  - Obtain quotation on repair work necessary and have necessary work completed

Discretionary Actions:

- Lock out well
- Well 4 open north loop
- Well 5 turn on boosters at well 3
- Well 6 turn on boosters at well 3
- Well 3 open valve to fill tank with Well 4

Mandatory Contacts:

- Water/Sewer Superintendent
- Water/Sewer Supervisor
- Distribution Maintenance Operator
- Production Maintenance Operator
- Public Works Director
- Utility Billing Division

Optional Contacts:

- John E. Pijawka Compliance Officer New Mexico Environment Department

Follow Up Actions Required:

- Written report (internal to Village)

Emergency Event:	C3 INACCESSIBLE ARSENIC TREATMENT PLANT
Emergency Trigger:	• Chemical leak inside water treatment plant • Any incident which prevents safe access to treatment plant
Risks:	• Public inconvenience • Health / Contamination

Actions Required:

- Evacuate arsenic treatment plant
- Advise Water/Sewer Superintendent of situation to determine appropriate response

Discretionary Actions:

- Remotely control water treatment plant from SCADA

Mandatory Contacts:

- Water/Sewer Superintendent
- Water/Sewer Supervisor
- Distribution Maintenance Operator
- Production Maintenance Operator

Optional Contacts:

- Public Works Director
- Utility Billing Division
- John E. Pijawka Compliance Officer New Mexico Environment Department
- Fire Department

Follow Up Actions Required:

- Written report (internal to Village)
- Written report to external agency (NMED)

Emergency Event:	C4 DISTRIBUTION PUMPING FAILURE (BOOSTER)
Emergency Trigger:	• Electrical loss or malfunction • Damage to pump house (fire, vehicular accident) • Equipment failure
Risks:	• Fire flow supply • Public inconvenience • Reduced treated water pumping capacity • Backflow contamination

Actions Required:

- Advise Water/Sewer Superintendent of situation to determine appropriate response
- Investigate failure, determine cause and appropriate repairs required
- Arrange for necessary repair works

Discretionary Actions:

- Contact a PNM
- Secure back-up power supply.
- If potential contamination, follow Suspected Contaminated Water Procedure B3

Mandatory Contacts:

- Water/Sewer Superintendent
- Water/Sewer Supervisor
- Distribution Maintenance Operator
- Production Maintenance Operator

Optional Contacts:

- Public Works Director
- Utility Billing Division

Follow Up Actions Required:

- Written report (internal to Village)

Emergency Event:	C5 WATER DISTRIBUTION RESERVOIR STRUCTURAL FAILURE
Emergency Trigger:	• Low level alarm at reservoir • Visible evidence of leaking water or structural damage
Risks:	• Environmental / Property Damage • Public inconvenience • Health / Contamination • Fire flow supply • Reduce treated water storage capacity • Partial loss of treated water supply

Actions Required:

- Advise Water/Sewer Superintendent of situation to determine appropriate response
- Contact Fire Department regarding reduced Fire Flow supply
- Investigate failure and determine cause
- Contact the Molzen Corbin Engineering to obtain confirmation on next steps

Discretionary Actions:

- If structural damage has occurred and draining the reservoir is required then:
  - Isolate the reservoir
  - drain the reservoir through the drain line and discharge as per specific operating procedures

Mandatory Contacts:

- Water/Sewer Superintendent
- Water/Sewer Supervisor
- Distribution Maintenance Operator
- Production Maintenance Operator
- Public Works Director

Optional Contacts:

- Utility Billing Division
- John E. Pijawka Compliance Officer New Mexico Environment Department

Follow Up Actions Required:

- Written report (internal to Village)

Emergency Event:	C6 SYSTEM POWER FAILURE
Emergency Trigger:	• Utility Alarms via SCADA system
Risks:	• Fire flow supply / Public inconvenience

Actions Required:

- Assess situation and determine magnitude of interruption
- Contact Water/Sewer Superintendent
- Contact PNM

Discretionary Actions:

- Notify Fire Department
- Notify Affected Users
- Secure other back-up power supplies

Mandatory Contacts:

- Water/Sewer Superintendent
- Water/Sewer Supervisor
- Distribution Maintenance Operator
- Production Maintenance Operator
- Public Works Director

Optional Contacts:

- Fire Department
- Affected Users
- Utility Billing Division

Follow Up Actions Required:

- Written report (internal to Village)

Emergency Event:	C7 SCADA System Failure
Emergency Trigger:	• Alarm indicating loss of SCADA communications
Risks:	• Fire flow supply • Public inconvenience

Actions Required:

- Contact Water/Sewer Superintendent
- Determine nature of failure (i.e.: communication or power failure)
- Determine magnitude of failure, specifically if the pump stations have been affected
- Implement schedule of manually checking operations at treatment plant, pump stations, and reservoirs (at least every 4 hours)
- Conduct necessary repairs

Discretionary Actions:

- Contact SCADA provider

Mandatory Contacts:

- Water/Sewer Superintendent
- Water/Sewer Supervisor
- Distribution Maintenance Operator
- Production Maintenance Operator
- Public Works Director

Optional Contacts:

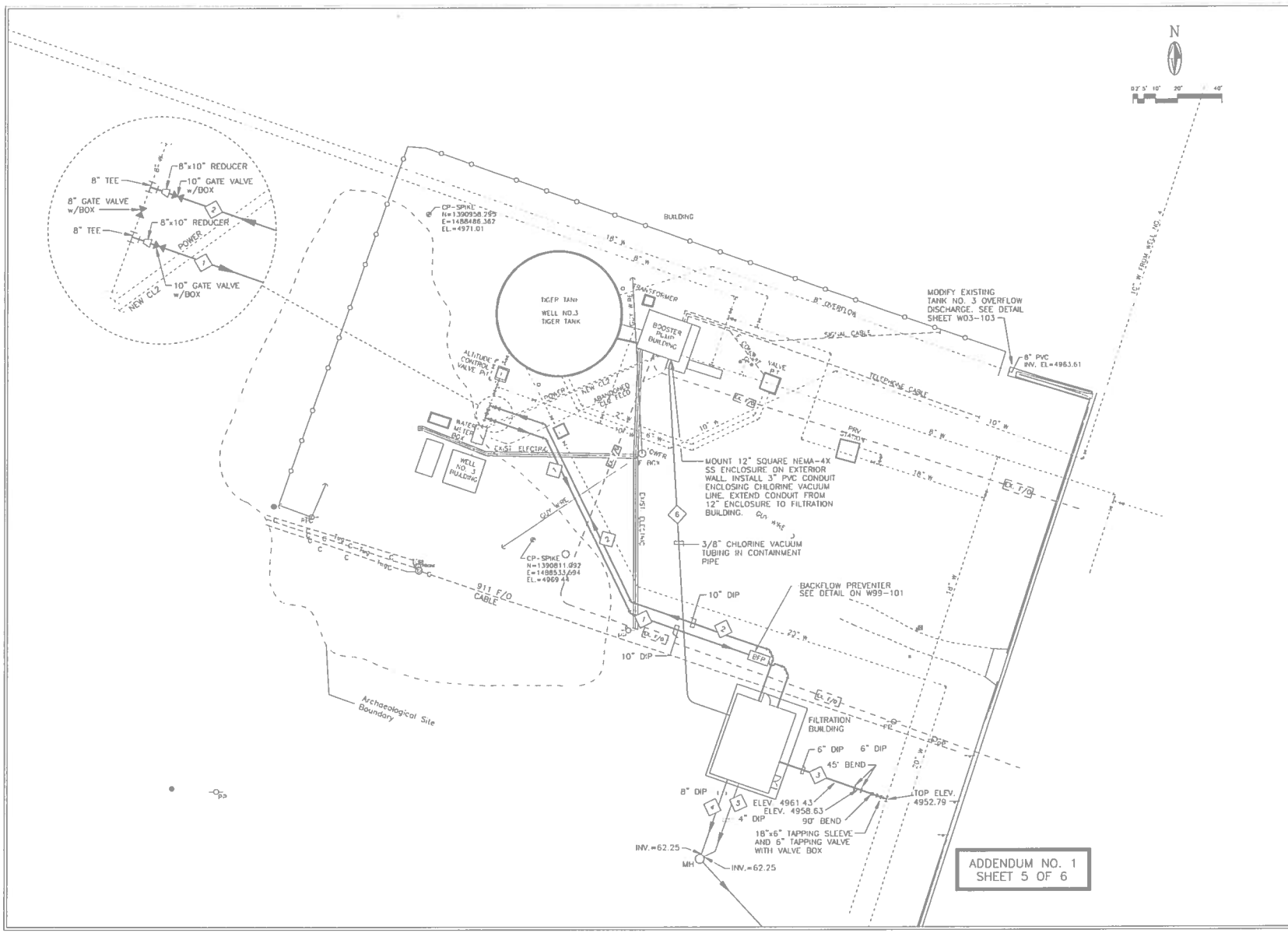
- Fire Department (in the event of limited or loss of fire flow supply)
- Utility Billing Division
- John E. Pijawka Compliance Officer New Mexico Environment Department

Follow Up Actions Required:

- Written report (internal to Village)

APPENDIX A

WATER SYSTEM SCHEMATIC AND TREATMENT PROCESS



Molzen-Corbin & Associates

RECORD DRAWING
DATE: 08/2010
DRAWN BY: MOLZEN-CORBIN

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED AND FURNISHED BY OTHERS. MOLZEN-CORBIN AND ASSOCIATES WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THIS DOCUMENT AS A RESULT.

REV. NO.	REV. DATE	DESCRIPTION

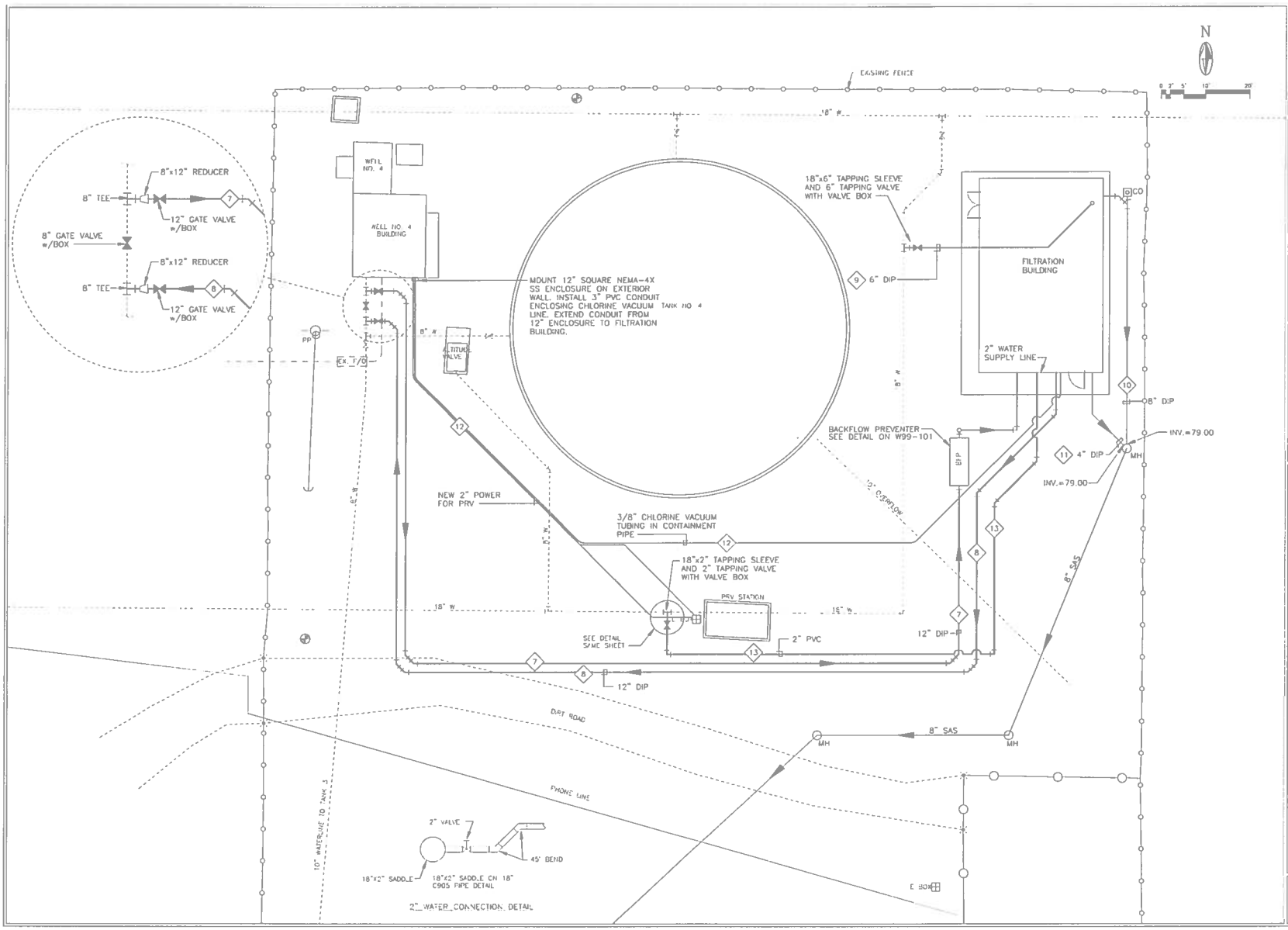
PROJECT NUMBER: LL081-11
DESIGNED BY: AL
DRAWN BY: AL
CHECKED BY: C. TEN EYCK
PROJECT ENGINEER: C. TEN EYCK
PROJECT DATE: MAY 2009

WELL NO. 3
SITE PLAN

ARSENIC TREATMENT SYSTEMS
VILLAGE OF LOS LUNAS
LOS LUNAS, NEW MEXICO

W03-100
SHEET

W03-100 9/30/10 1:1



Molzen-Corbin & Associates

RECORD DRAWING

DATE: 08/2010

DRAWN BY: MOLZEN-CORBIN

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED AND FURNISHED BY OTHERS. MOLZEN-CORBIN AND ASSOCIATES WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THIS DOCUMENT AS A RESULT.

REV NO.	REV DATE	DESCRIPTION
PROJECT NUMBER:		LL081-11
DESIGNED BY:		A.L.
DRAWN BY:		A.L.
CHECKED BY:		C. TEN EYCK
PROJECT ENGINEER		C. TEN EYCK
PROJECT DATE:		MAY 2009

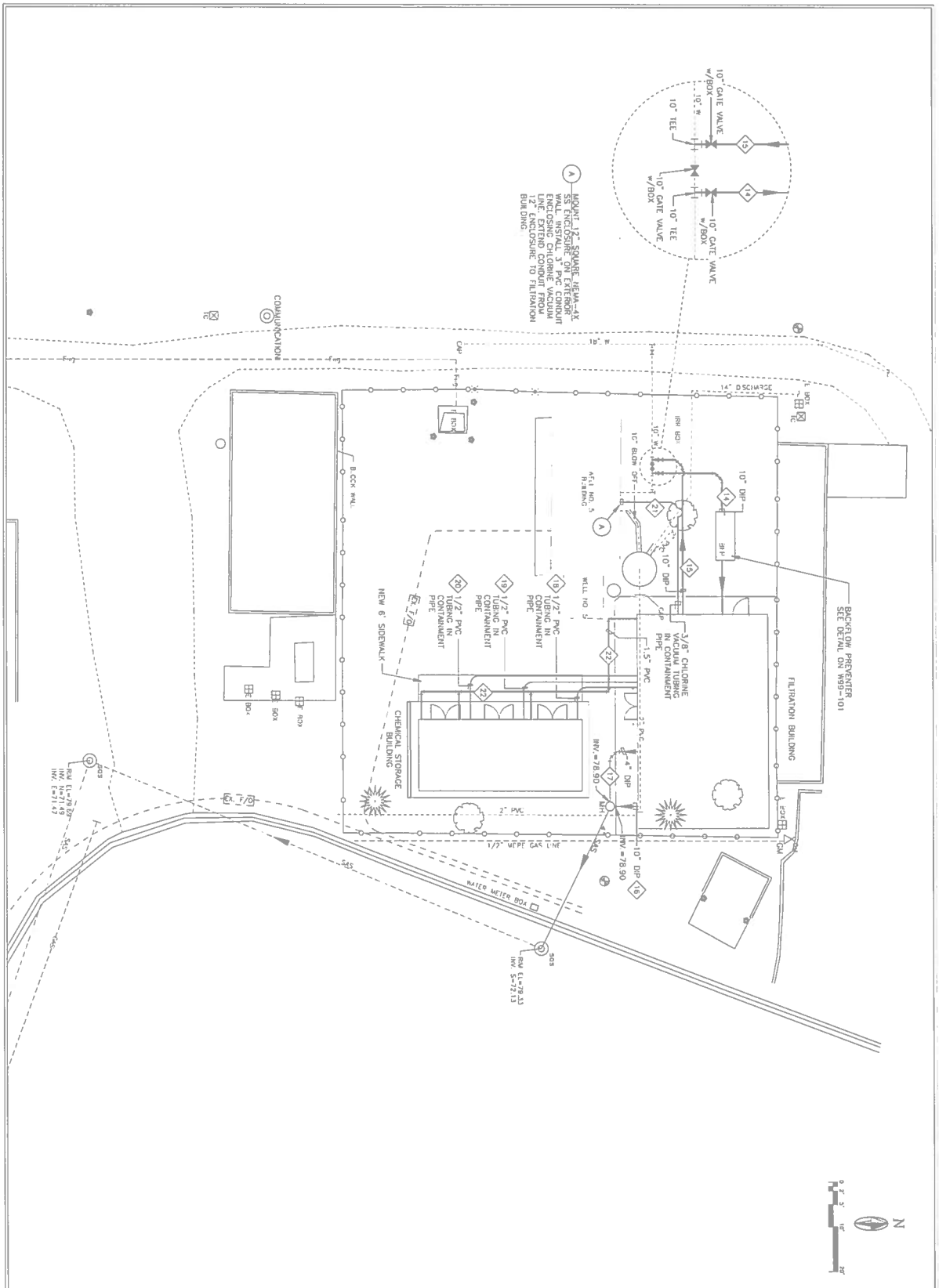
WELL NO. 4
SITE PLAN

ARSENIC TREATMENT SYSTEMS
VILLAGE OF LOS LUNAS
LOS LUNAS, NEW MEXICO

W04-100

SHEET

W04-100 9/30/10 1:1



WELL NO. 5
SITE PLAN

ARSENIC TREATMENT SYSTEMS
VILLAGE OF LOS LUNAS
LOS LUNAS, NEW MEXICO

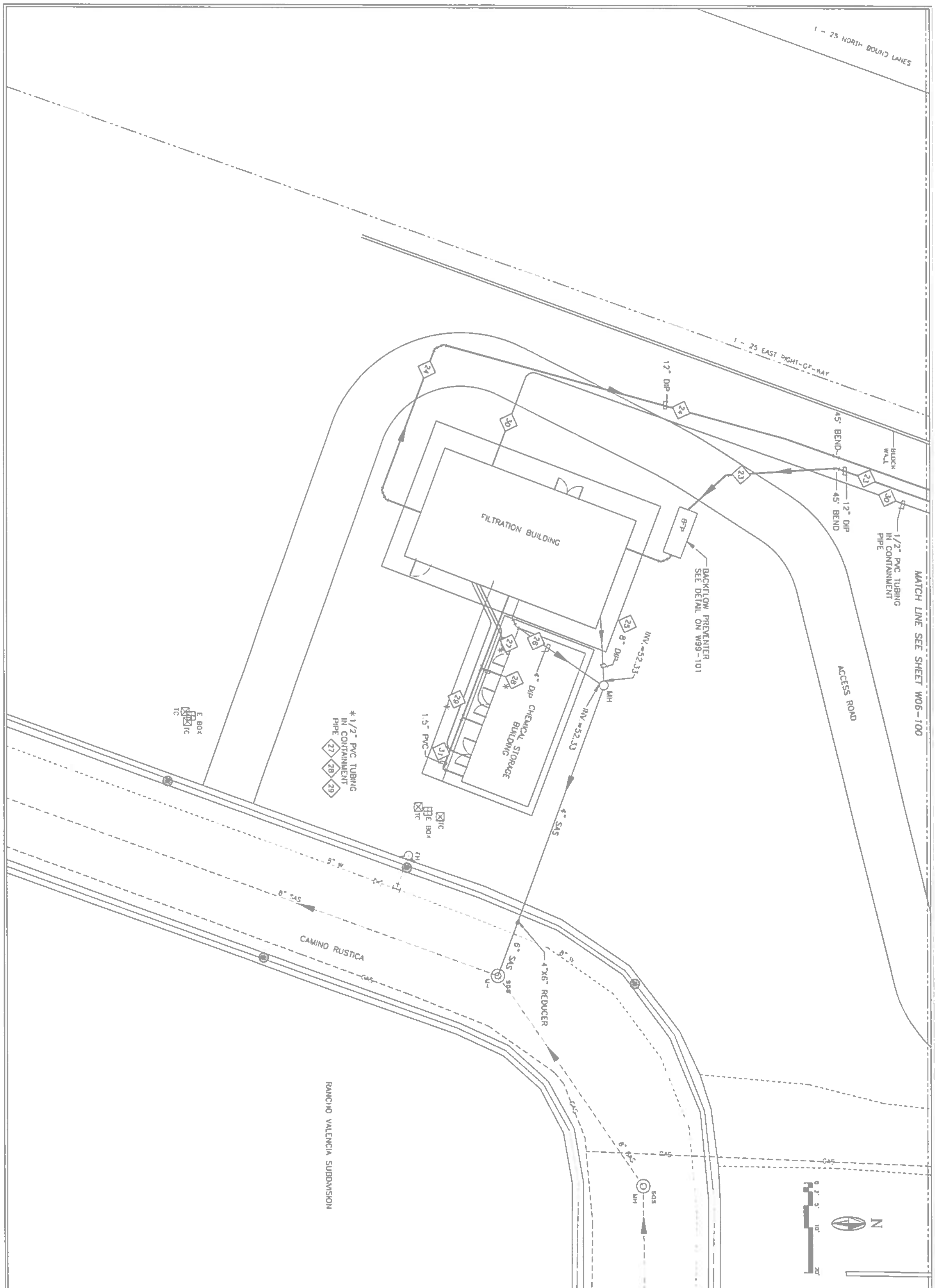
REV NO	REV DATE	DESCRIPTION

PROJECT NUMBER:	LL081-11
DESIGNED BY:	A.L.
DRAWN BY:	A.L.
CHECKED BY:	C. TEN EYCK
PROJECT ENGINEER	C. TEN EYCK
PROJECT DATE	MAY 2009

RECORD DRAWING
DATE 06/2010
DRAWN BY: MOLZEN-CORBIN

Molzen-Corbin & Associates
2701 Miles Road S.E.
Albuquerque, New Mexico 87106
voice (505) 242-3700
fax (505) 242-0673

SHEET W05-100



REV NO	REV DATE	DESCRIPTION

PROJECT NUMBER:	LL081-11
DESIGNED BY:	A.L.
DRAWN BY:	A.L.
CHECKED BY:	C. TEN EYCK
PROJECT ENGINEER	C. TEN EYCK
PROJECT DATE	MAY 2009

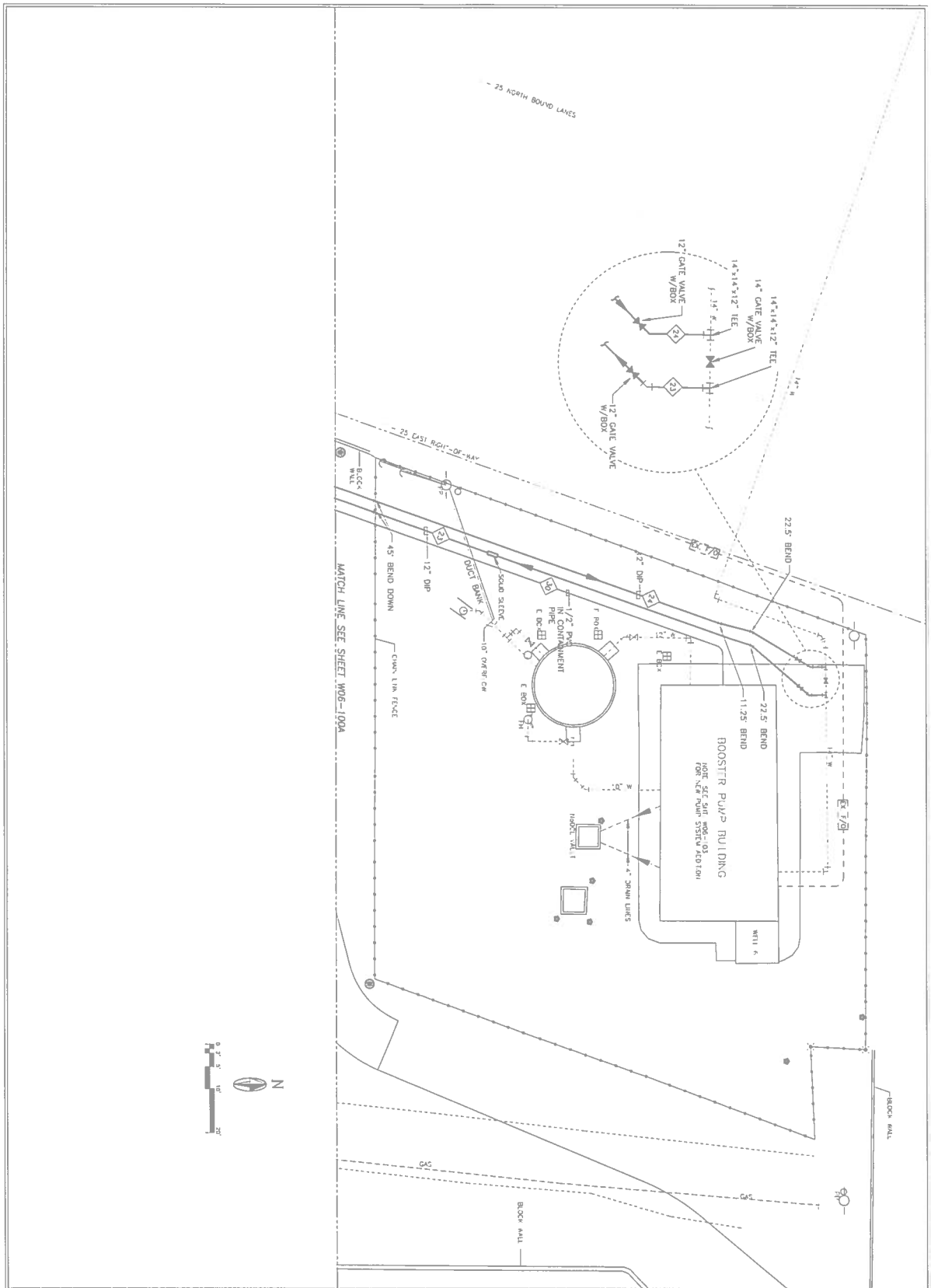
RECORD DRAWING
DATE: 08/2010
DRAWN BY:

WELL NO. 6
SITE PLAN

ARSENIC TREATMENT SYSTEMS
VILLAGE OF LOS LUNAS
LOS LUNAS, NEW MEXICO

SHEET W06-100A

Molzen-Corbin & Associates
2701 Miles Road S.E.
Albuquerque, New Mexico 87106
voice (505) 242-5700
fax (505) 242-0673



WELL NO. 6
SITE PLAN

ARSENIC TREATMENT SYSTEMS
VILLAGE OF LOS LUNAS
LOS LUNAS, NEW MEXICO

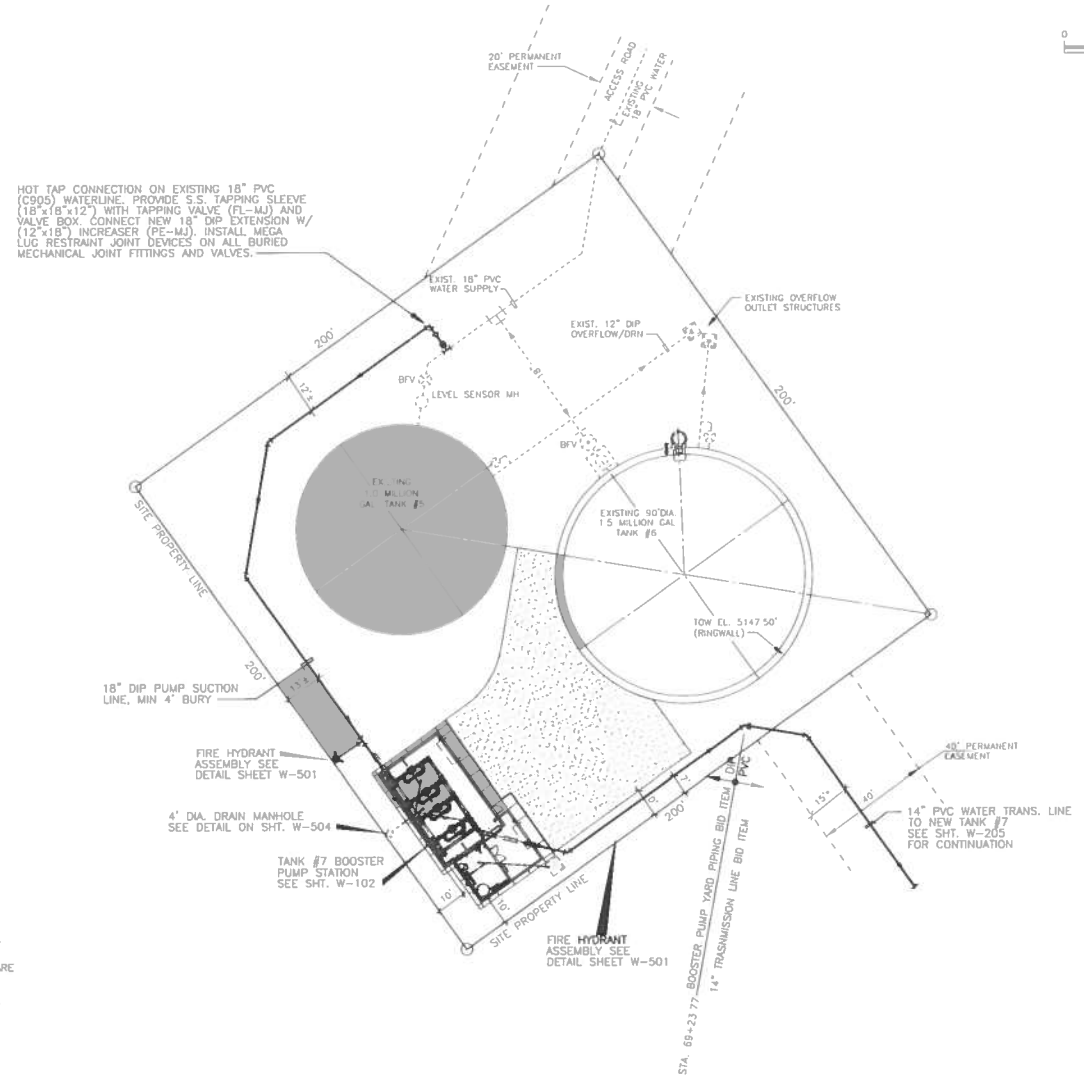
REV NO	REV DATE	DESCRIPTION

PROJECT NUMBER:	LL081-11
DESIGNED BY:	A.L.
DRAWN BY:	A.L.
CHECKED BY:	C. TEN EYCK
PROJECT ENGINEER	C. TEN EYCK
PROJECT DATE	MAY 2009

RECORD DRAWING
DATE 10/2010
DRAWN BY: [illegible]

Molzen-Corbin & Associates
2701 Miles Road S.E.
Albuquerque, New Mexico 87106
voice (505) 242-5700
fax (505) 242-8873

SHEET W06-100



GENERAL NOTES:

1. ALL AREAS WITHIN THE TANK 6 SITE BOUNDARY AND ALONG THE TANK SITE ENTRANCE ROADWAY SHOULDER THAT ARE DISTURBED DURING CONSTRUCTION, THAT HAVE NO OTHER GROUND TREATMENT, SHALL RECEIVE RECLAMATION SEEDING IN ACCORDANCE WITH SPECIFICATION SECTION 02938.

2. INSTALL MEGA LUG RESTRAINT JOINT DEVICES ON ALL BURIED MECHANICAL JOINT END PIPING FITTINGS AND VALVES.

Molzen-Corbin & Associates
2701 Miles Road S.E.
Albuquerque, New Mexico 87190
(505) 318-7199
Fax (505) 332-0673

RECORD DRAWING
DATE: 12/03/07
DRAWN BY: JLB
THESE RECORD DRAWINGS WERE WITH PROVIDED, IN PART OR IN THE BASIS ON INFORMATION COMPILED AND FURNISHED BY OTHERS. MOLZEN-CORBIN AND ASSOCIATES WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED INTO THIS DOCUMENT AS A RESULT.

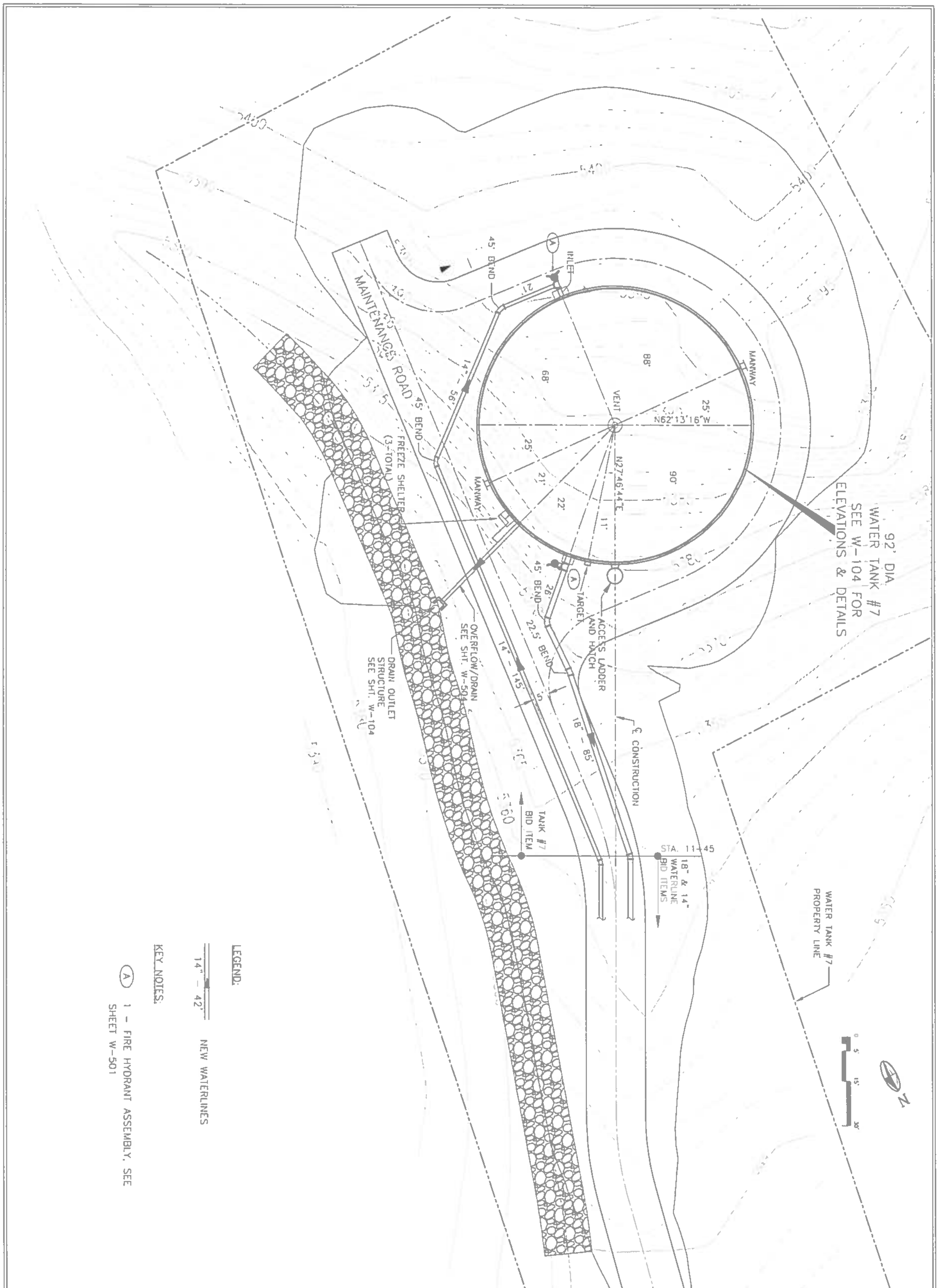
REV. NO.	REV. DATE	DESCRIPTION
PROJECT NUMBER:		1001-11
DESIGNED BY:		MC/ STAFF
DRAWN BY:		C. SPIELLD
CHECKED BY:		C. CAMPOS
PROJECT ENGINEER:		A. ARCHULETA
PROJECT DATE:		JUNE 2006

TANK #7 BOOSTER PUMP BUILDING
YARD PIPING AND SITE PLAN

TANK #7 AND BOOSTER PUMP
VILLAGE OF LOS LUNAS
LOS LUNAS, NEW MEXICO

W-101
SHEET 24 of 51

WLL-101 03-30-06 1:1



WATER TANK ORIENTATION
SITE PIPING PLAN

TANK #7 AND BOOSTER PUMP
VILLAGE OF LOS LUNAS
LOS LUNAS, NEW MEXICO

REV NO	REV DATE	DESCRIPTION

PROJECT NUMBER:	LL061-11
DESIGNED BY:	VV
DRAWN BY:	VV
CHECKED BY:	KE
PROJ ENGINEER:	Kevin Eades, PE
PROJECT DATE:	JUNE 2006

RECORD DRAWING
DATE: 12/03/07 DRAWN BY: AB

Molzen-Corbin & Associates
2701 Miles Road S.E.
Albuquerque, New Mexico 87106
voice (505) 242-5700
fax (505) 242-0673

C-301
SHEET 08 of 51

APPENDIX B

EMERGENCY CONTACT INFORMATION

EMERGENCY CONTACT INFORMATION

Organization	Name	Position
Village of Los Lunas	Michael Jaramillo	Public Works Director (505) 975-9131 jaramillom@loslunasnm.gov
Village of Los Lunas	Ray R Vigil	Water/Sewer Superintendent (505) 363-0847 vigilr@loslunasnm.gov
Village of Los Lunas		Water/Sewer Supervisor
Village of Los Lunas	Janice Byrnes	Utility Division Billing Supervisor (505) 839-3841 byrnesj@loslunasnm.gov
Molzen-Corbin & Associates	Clayton Ten Eyck, P.E.	Vice President - Water Resources Engineer (505)440-1745 cteneyck@molzencorbin.com
Mec-Tec Services	Nicole Mangin	Village's Consultant (505) 459-6832 nikimangin@cableone.net
New Mexico Environment	John Pijawka	Compliance Officer (575) 973-0642 john.pijawka@state.nm.us
Village of Los Lunas	Gregory Martin	Village Administrator (505) 238-4453 marting@loslunasnm.gov
Village of Los Lunas	John Gabaldon	Fire Chief (505) 991-2343 jgabaldon@loslunasnm.gov
Village of Los Lunas	Tommy Madrid	Asst. Fire Chief (505) 991-5623 tmadrid@loslunasnm.gov
Village of Los Lunas	Jason Gonzales	Fire Marshal (505) 991-6229 gonzalesj@loslunasnm.gov

APPENDIX C

WATER NOTICES SAMPLES, PROCEDURES AND SIGNS

WATER QUALITY ADVISORY

Issued pursuant to **[and Order OR a Request]** of a Drinking Water Officer under Section 14 of the *Drinking Water Protection Act*

WATER SUPPLY SYSTEM COVERED BY THIS ADVISORY

This Water Quality Advisory applies to the following water supply system:

[DESCRIPTION OF SYSTEM], Operating permit number _____

and should be considered by all persons using water from the system.

REASON FOR THIS ADVISORY

This Advisory is being issued because:

[Include:

- A description of the drinking water threat that occurred, including the potential health effects
- The population at risk
- What the water system is doing to correct the problem]

RECOMMENDATIONS

The Drinking Water Officer, in consultation with the NMED, recommends the following steps be taken to minimize the risks associated with this water system.

[Set out proposed steps including use of alternate water supplies, avoiding consumption by vulnerable groups etc.]

OBLIGATIONS OF OWNERS OF PUBLIC PREMISES

Owners of public premises served by this water system must:

(a) notify the public that the water is not potable water by posting a sign at every sink or drinking water fountain accessible to the public;

(b) if normal business practices provide an opportunity, verbally advise any person who may use the water system for domestic purposes that the water is not potable.

(See Drinking Water Protection Regulation, s. 10)

DURATION OF THIS ADVISORY

This Advisory remains in effect unless and until another public notice is issued upon the [Request Or Order] of NMED advising that the Advisory has been amended or may be rescinded.

WHAT IS A WATER QUALITY ADVISORY

A Water Quality Advisory is one of three types of public notices commonly used by Drinking Water Officers. The decision whether to request or order issuance of one of these notices rests with the discretion of the Drinking Water Officer, but in general, they are used under the following circumstances:

Water Quality Advisory	Used in situations in which the public health threat posed by the water system is modest, and actions can be taken to reduce the risks through means other than requiring a Boil Water Notice or Do Not Use Water Notice.
Boil Water Notice	Used in situations in which the public health threat posed by the water supply system is significant and the nature of the threat is one that can be effectively addressed through the boiling of water.
Do Not Use Water Notice	Used in situations where a significant public health threat exists in relation to the water supply system and the threat cannot be adequately addressed through a Water Quality Advisory or a Boil Water Notice.

QUESTIONS

If you have any questions concerning this advisory, please contact:

Village Of Los Lunas, Owner or Operator of the water supply system at (505) 839-3840

[SELECT ONE OR MORE OF THE FOLLOWING, AS APPROPRIATE FOR THE CIRCUMSTANCES AND THE OFFICE/HEALTH AUTHORITY IN QUESTION]

_____, Public Works Director, at [TELEPHONE],
_____, Water/Sewer Superintendent, at [TELEPHONE],
_____, Water/Sewer Supervisor, at [TELEPHONE],
_____, Production Maintenance Operator, at [TELEPHONE],
_____, Distribution Maintenance Operator, at [TELEPHONE],

BOIL WATER NOTICE

Issued pursuant to **[and Order OR a Request]** of a Drinking Water Officer under section 14 of the *Drinking Water Protection Act*

WATER SUPPLY SYSTEM COVERED BY THIS NOTICE

This Boil Water Notice applies to the following water supply system:
[DESCRIPTION OF SYSTEM], operating permit number ____
and should be considered by all persons using water from the system.

REASON FOR THIS NOTICE

This Notice is being issued because:

Include:

- A description of the drinking water threat that occurred, including the potential health effects
- The population at risk
- What the water system is doing to correct the problem]

RECOMMENDATIONS

The Drinking Water Officer, in consultation with the Medical Health Officer, recommends the following steps be taken to minimize the risks associated with this water system.

[Set out proposed steps including use of alternate water supplies, avoiding consumption by vulnerable groups etc.]

OBLIGATIONS OF OWNERS OF PUBLIC PREMISES

Owners of public premises served by this water system must:

A. Notify the public that the water is not potable water by posting a sign at every sink or drinking water fountain accessible to the public.
B. If normal business practices provide an opportunity, verbally advise any person who may use the water system for domestic purposes that the water is not potable.

(See Drinking Water Protection Regulation, s. 10)

DURATION OF THIS NOTICE

This Notice remains in effect unless and until another public notice is issued upon the [Request or Order] of a Drinking Water Officer advising that the Notice has been amended or may be rescinded.

WHAT IS A BOIL WATER NOTICE

A Boil Water Notice is one of three types of public notices commonly used by NMED. The decision whether to request or order issuance of one of these notices rests with the discretion of the NMED, but in general, they are used under the following circumstances:

Water Quality Advisory Used in situations in which the public health threat posed by the water system is modest, and actions can be taken to reduce the risks through means other than requiring a Boil Water Notice or Do Not Use Water Notice.

Boil Water Notice Used in situations in which the public health threat posed by the water supply system is significant and the nature of the threat is one that can be effectively addressed through the boiling of water.

Do Not Use Water Notice Used in situations where a significant public health threat exists in relation to the water supply system and the threat cannot be adequately addressed through a Water Quality Advisory or a Boil Water Notice.

QUESTIONS

If you have any questions concerning this Notice, please contact:

Village Of Los Lunas, Owner or Operator of the water supply system at (505) 839-3840

[SELECT ONE OR MORE OF THE FOLLOWING, AS APPROPRIATE FOR THE CIRCUMSTANCES AND NMED]

_____, Public Works Director, at [TELEPHONE],
_____, Water/Sewer Superintendent, at [TELEPHONE],
_____, Water/Sewer Supervisor, at [TELEPHONE],
_____, Production Maintenance Operator, at [TELEPHONE],
_____, Distribution Maintenance Operator, at [TELEPHONE],

DO NOT USE WATER NOTICE

Issued pursuant to **[and Order OR a Request]** of a Drinking Water Officer under section 14 of the *Drinking Water Protection Act*

WATER SUPPLY SYSTEM COVERED BY THIS NOTICE

This Do Not Use Water Notice applies to the following water supply system:

[DESCRIPTION OF SYSTEM], operating permit number _____

and should be considered by all persons using water from the system.

REASON FOR THIS NOTICE

This Notice is being issued because:

[Include:

- A description of the drinking water threat that occurred, including the potential health effects
- The population at risk
- What the water system is doing to correct the problem]

RECOMMENDATIONS

The Drinking Water Officer, in consultation with the Medical Health Officer, recommends the following steps be taken to minimize the risks associated with this water system.

[Set out proposed steps including use of alternate water supplies, avoiding consumption by vulnerable groups etc.]

OBLIGATIONS OF OWNERS OF PUBLIC PREMISES

Owners of public premises served by this water system must:

(c) notify the public that the water is not potable water by posting a sign at every sink or drinking water fountain accessible to the public;

(d) if normal business practices provide an opportunity, verbally advise any person who may use the water system for domestic purposes that the water is not potable.

(See Drinking Water Protection Regulation, s. 10)

DURATION OF THIS NOTICE

This Notice remains in effect unless and until another public notice is issued upon the [Request Or Order] of a Drinking Water Officer advising that the Notice has been amended or may be rescinded.

WHAT IS A DO NOT USE WATER NOTICE

A Do Not Use Water Notice is one of three types of public notices commonly used by Drinking Water Officers. The decision whether to request or order issuance of one of these notices rests with the discretion of the Drinking Water Officer, but in general, they are used under the following circumstances:

Water Quality Advisory	Used in situations in which the public health threat posed by the water system is modest, and actions can be taken to reduce the risks through means other than requiring a Boil Water Notice or Do Not Use Water Notice.
Boil Water Notice	Used in situations in which the public health threat posed by the water supply system is significant and the nature of the threat is one that can be effectively addressed through the boiling of water.
Do Not Use Water Notice	Used in situations where a significant public health threat exists in relation to the water supply system and the threat cannot be adequately addressed through a Water Quality Advisory or a Boil Water Notice.

QUESTIONS

If you have any questions concerning this Notice, please contact:

Village Of Los Lunas, Owner or Operator of the water supply system at (505) 839-3840

[SELECT ONE OR MORE OF THE FOLLOWING, AS APPROPRIATE FOR THE CIRCUMSTANCES AND THE OFFICE/HEALTH AUTHORITY IN QUESTION]

_____, Public Works Director, at [TELEPHONE],
_____, Water/Sewer Superintendent, at [TELEPHONE],
_____, Water/Sewer Supervisor, at [TELEPHONE],
_____, Production Maintenance Operator, at [TELEPHONE],
_____, Distribution Maintenance Operator, at [TELEPHONE],

Procedure for Notifying Users and Placing of Boil Water Advisory Signs

You have been assigned the task of notifying water users and for placing Boil Water Advisory signs at specific locations within a defined area of Dawson Creek. The attached lists are to be used to track the buildings and/or houses notified of the Boil Water. Space is provided to indicate how notification occurred and how many signs were placed. This same form will be used to record the removal of signs when the Boil Water Advisory is complete.

Single family residences, multi-family property managers, and businesses are to be notified both verbally and with a written notice. If no one is available a written notice should be left in a conspicuous location (i.e. the mail box or taped on the door).

Signs are to be placed at the locations listed below. For all private buildings permission must be obtained from the property manager prior to entering the building.

Multi-Family Residences, Commercial or Public Buildings, Parks

1. Inside and outside of every exit or entrance door
2. Both sides of each door that accesses stair wells
3. Above the elevator call buttons on each floor
4. Inside each elevator
5. On the outside of each public bathroom door
6. On the mirror above each sink contained within a public bathroom
7. Above all water fountains

Record Form for Notifying Multi-Family Residences, Commercial or Public Buildings, Parks

Building	# of Signs Placed	# of Signs Removed
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.		

Placement of signs completed: _____ _____ _____

Date Time Signature

Removal of signs completed: _____ _____ _____

Date Time Signature

Record Form for Notifying Single-Family Residences,

House Address	Verbal and Written Notification (Y/N)	Mail Box Notification (Y/N)
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.		

Notification completed: _____ _____ _____

Date Time Signature

WARNING

This water is
NOT SAFE
for drinking or domestic use.

Posted_____(date)

Village of Los Lunas

Contact (505) 839-3841 for further details.

APPENDIX D

EMERGENCY ACTION RECORD FORM

Emergency Action Record Form

Description of Emergency: _____

_____

_____

_____

Emergency Reported: Date:_____ Time:_____ By: _____

RESPONSE ACTION	DATE	TIME

Emergency Record Completed by:

APPENDIX E

WATER MAIN BREAK RECORD FORM

VILLAGE OF LOS LUNAS

Date _____

SIZE(in) & TYPE OF MAIN

_____AC_____PVC_____DI_____

_____CI (unlined)_____CI (lined)

(poly)_____Steel

_____Other (_____)

Location _____

(Street)

COMMENTS:

_____

_____

_____

_____

_____

1. WHAT PART OF MAIN WAS DAMAGED

- A. Pipe barrel
- B. Joint
- C. Valve
- D. Flange nuts, bolts, tie rods
- E. Service connection
- F. Other (Explain on back)

2. WHAT CAUSED THIS DAMAGE IN YOUR OPINION?

- A. Ground Movement
- B. Contractors Equipment
- C. Coating Failure
- D. Corrosion / Electrolysis
- E. Other _____
- F. Unknown

3. INTERNAL CORROSION DAMAGE?

- No Corrosion Damage
- B. Pitting (____% of surface area)
- C. Gen. Corrosion (____% of wall thick.)

4. EXTERNAL CORROSION DAMAGE?

- No Corrosion Damage
- B. Pitting (____% of surface area)
- C. Gen. Corrosion (____% of wall thick.)

5. WHAT REPAIRS WERE MADE?

- Leak Repair Clamp
- Welded
- Replaced valve
- Replaced section
- E. Other_____

6. SHOULD PIPE BE REPLACED?

- A. Yes
- B. No
- C. Not sure

7. HOW BIG WAS THE LEAK?

- A. Break (Entire circumference)
- B. Small Hole (under 1")
- C. Large hole
- D. Split

8. WHAT IS NATIVE SOIL LIKE?

- A. Clay
- B. Loam
- C. Sandy
- D. Gravel Rock

9. WHAT IS BEDDING TYPE?

- Granular
- Sand
- Native Soil

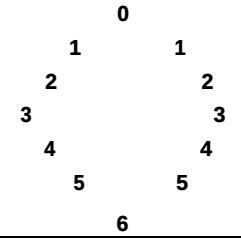
10. WHAT IS BEDDING CONDITION?

- A. Appears Uniform
- B. Obvious Voids or Washout

11. DEPTH OF COVER IN FT.

+10	5
10	4
9	3
8	2
7	1
6	

12. WHERE WAS THE LEAK?



FOLLOW UP ACTIONS COMPLETED.

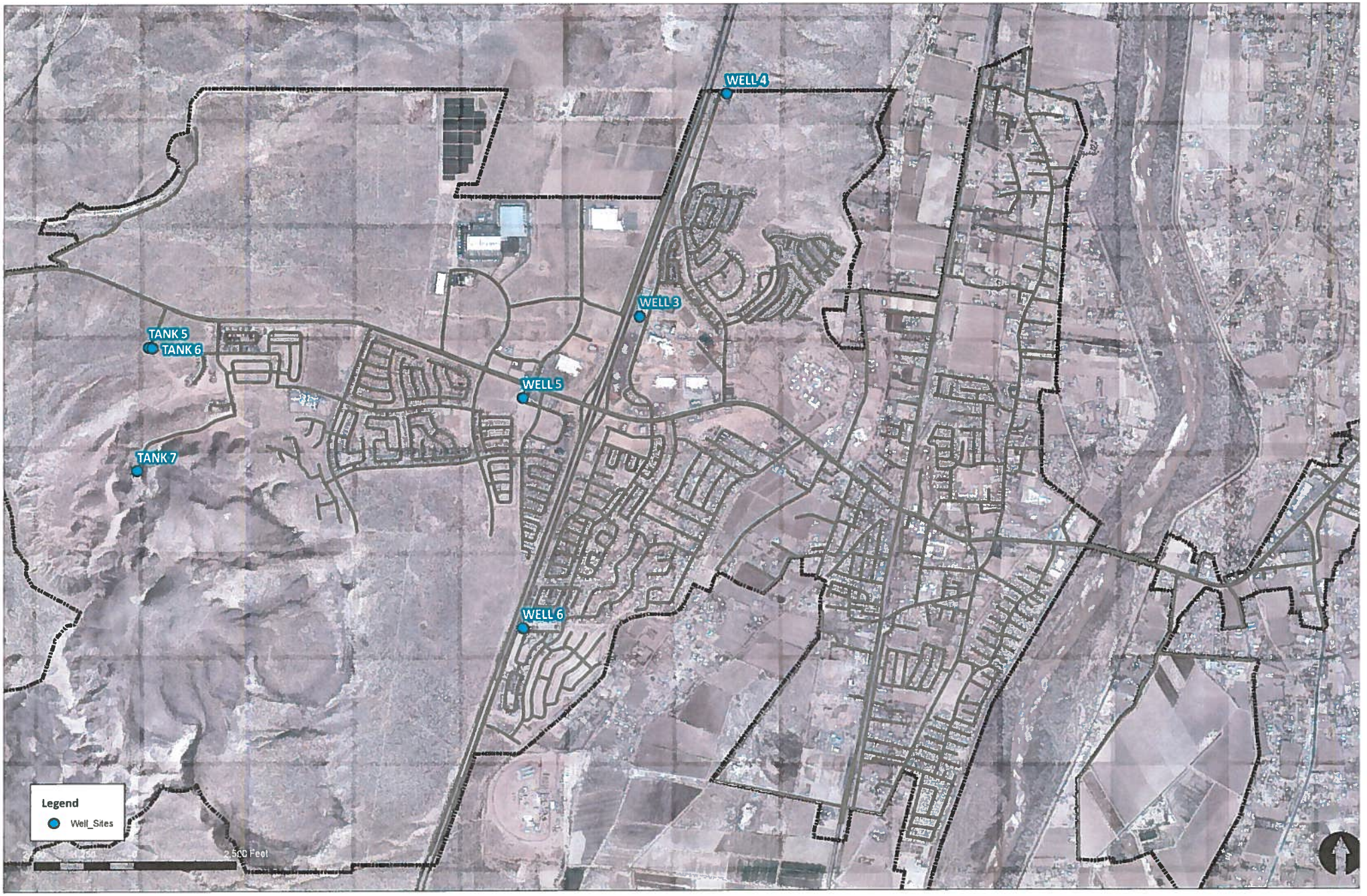
- A. Photographs taken of break.
- B. Main flushed until water ran clear/Disinfect repaired main
- C. Water sample taken downstream of break.

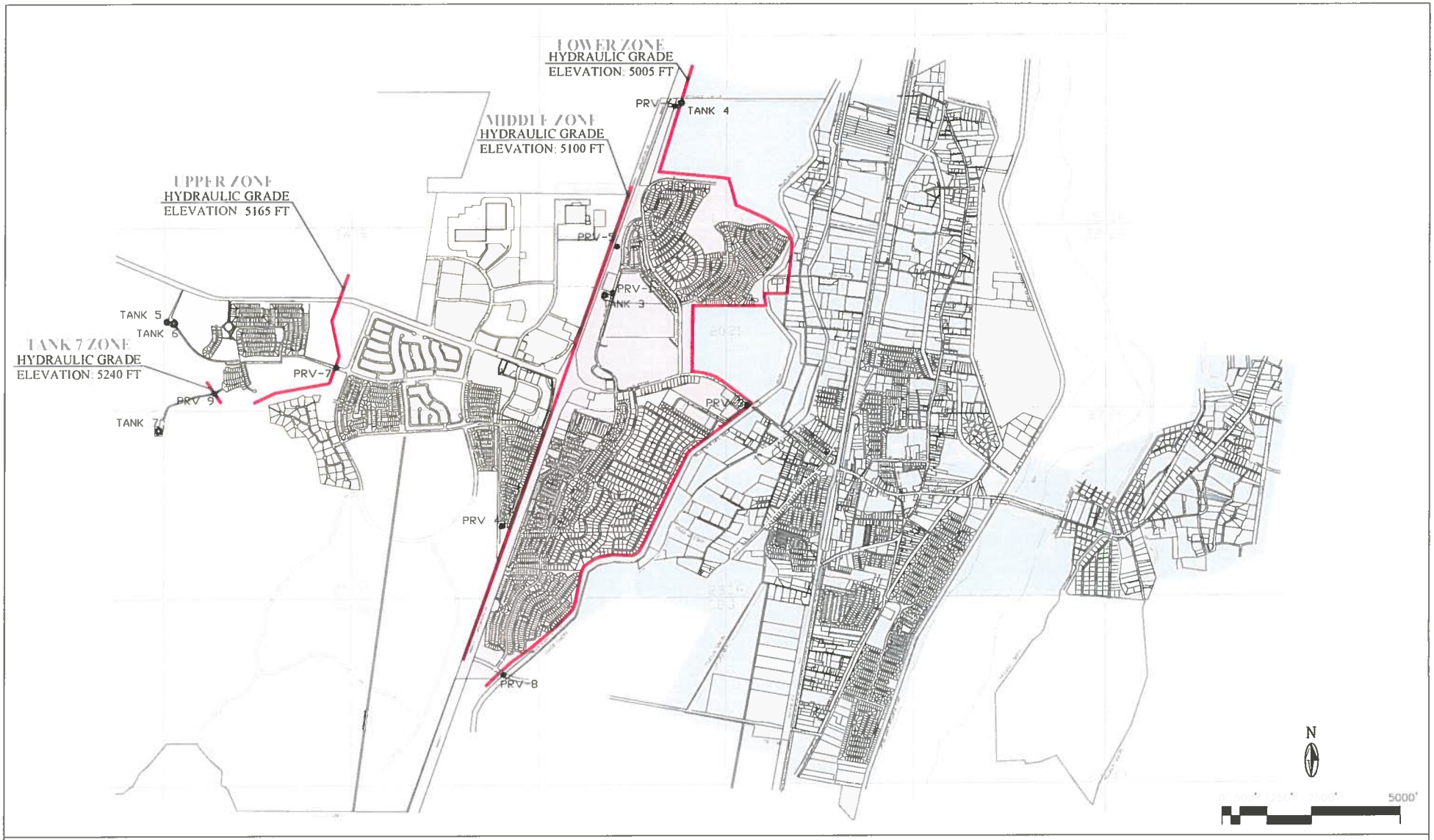
WATER MAIN LEAK OR BREAK REPAIR

Operator's Signature: _____

APPENDIX F

SCHEMATICS OF WATER SYSTEM COMPONENTS

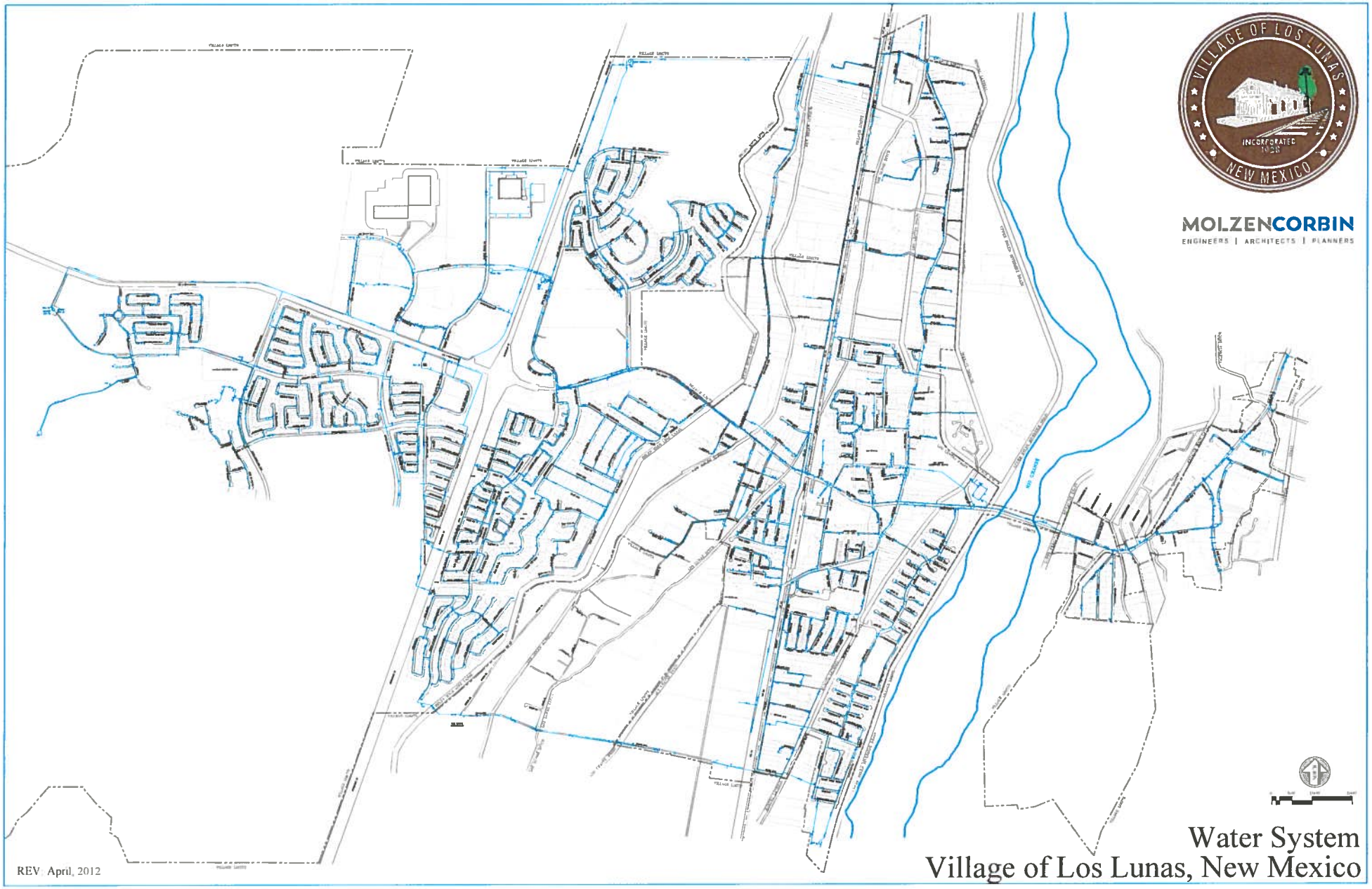

WELL 4
WELL 3
TANK 5
TANK 6
WELL 5
TANK 7
WELL 6
Legend
Well_Sites
2,500 Feet



MOLZENCORBIN

Water System Master Plan - Village of Los Lunas, NM

Pressure Zone Map


VILLAGE OF LOS LUNAS
INCORPORATED
1928
NEW MEXICO
MOLZENCORBIN
ENGINEERS | ARCHITECTS | PLANNERS
REV: April, 2012
Water System
Village of Los Lunas, New Mexico


VILLAGE OF LOS LUNAS
INCORPORATED
1928
NEW MEXICO
MOLZENCORBIN
ENGINEERS | ARCHITECTS | PLANNERS
REV April, 2012
Sanitary Sewer System
Village of Los Lunas, New Mexico

APPENDIX G

Standard Operating Procedure

Emergency Response Plans and Programs

The following plans are located in Appendix G

- Alarms
- After Hours
- Bomb Threats
- Chemical Spills
- Civil Disorder
- Fire
- Flood
- Lightning/Electrical Storm
- Mechanical/Equipment Failure
- Power Failure
- Repair Priorities
- Spill Response Plan for WWTP
- Spill Response Plan for Collection System

Emergency Response Training and Drills

The purpose of training personnel in emergency procedures is to ensure that in the event of an emergency the staff may act quickly and decisively to protect life and property. Training or drills for the following emergencies should be conducted quarterly.

- Fire
- Power Failure
- Flood
- Evacuation

Annually, the staff should receive annual CPR and First Aid training. Specific items to be covered in each training session or drill must include the following:

Fire-

Fire extinguisher locations

Extinguisher identification

Correct use of an extinguisher

Procedures for reporting a fire

Power Failure-

Location of emergency generator(s)

Location of power transfer switches

Operating instructions for emergency generator(s)

Bypass reporting procedures

Procedures for reporting a power failure

Flood-

Location of areas subject to flooding

Sand bagging techniques

Location of power disconnects

Evacuation-

Emergency Response Center location

Records Preservation

The following records and inventories are essential to the operation of the facility. Current copies of these documents should be stored in a safe place, away from the Facility. Copies and working records may be either computerized data and/or hard copy. Records and data that are computerized should exist also as a hard copy.

Computerized information must be backed up Monthly to be kept timely.

- Discharge Monitoring Reports
- Equipment and maintenance Inventories
- Laboratory Inventory
- Plant Operation Records
- Industrial Discharge Permits

Appendix G

After Hours

In the event of after hour's collection or distribution troubles, the emergency call services will call the individual that is On- Call. The individual contacted will investigate the reported condition and call in additional personnel and assistance as needed. If additional assistance is required, the person in charge will call in additional resources needed to bring the system back into service.

Alarms

Lift Stations:

See lift station data sheets in Appendix G

Life Stations – 1 through 24

Active alarm, high wet well level

Active alarm, power fail

Active alarm, called for not run

Bomb Threats or Threats Warnings

- Notify Police Department at 911
- Notify Utilities Director / Water/Sewer Superintendent
- Notify Department Supervisor.
- Follow Police Department instructions
- Evacuate non-essential personnel to a safe place per Police Department instructions

Chemical Spills

READ THE SAFETY DATA SHEETS (MSDS) FOR CHEMICALS USED AND UNDERSTAND THE HAZARDS OF CHEMICALS.

Powder/Granular Spills

1. Do not inhale any debris from the spill; inhalation of a chemical powder may be hazardous or irritant to a person. If the spill is exposed to the skin, follow MSDS instructions. Most are not immediately painful and if they remain in contact with the body until pain can be felt, serious injury generally has already taken place. Protection can be provided through adequate exhaust ventilation, wearing gloves, respirators and protective clothing.
2. Do not try to clean up the spill by rinsing with any liquid. Liquids may react with the chemical or the liquid may cause the spill to spread.
3. Clean up the spill in accordance with MSDS instructions and put into a proper container, disposal at WWTP.

Sodium Hypochlorite

ALWAYS READ THE SAFETY DATA SHEET MSDS ON ANY HAZARDOUS CHEMICAL PRIOR TO USE

1. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Discard contaminated shoes.

2. Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133.

3. Wear appropriate protective gloves to prevent skin exposure.

4. Wear appropriate protective clothing to prevent skin exposure. After contact with skin, wash immediately with running water.

5. None of the chemicals in this product are considered highly hazardous by OSHA.

6. Remove all sources of ignition. Absorb spill using an absorbent, non-combustible material such as earth, sand, or vermiculite. Do not use combustible materials such as saw dust. Provide ventilation.

7. Clean up the spill in accordance with MSDS instructions.

Acids

ALWAYS READ THE SAFETY DATA SHEET MSDS ON ANY HAZARDOUS CHEMICAL PRIOR TO USE

1. Wear protective gloves and a face shield.
2. Turn on closest exhaust fan to get rid of fumes.
3. Sprinkle sodium bicarbonate (baking soda) over acid to neutralize it.

Bases (Alkalis)

ALWAYS READ THE SAFETY DATA SHEET MSDS ON ANY HAZARDOUS CHEMICAL PRIOR TO USE

1. Wear protective clothing such as gloves, face shield, and protective mask.
2. Provide ventilation with exhaust fan or fume hood.

Civil Disorder

1. Contact Police Department, 9-1-1
2. Notify Utilities Director and Manager
3. Bring to "full" inventories of treatment chemicals and fuel
4. Notify Police of movement schedules: staff and persons conducting business with the facility
5. Arrange escorts where necessary
6. Notify Village Manager's Office of unusual changes in daily flow pattern or volume
7. Lock exterior doors and perimeter gates
8. Restrict activity that may subject the staff to physical or verbal attack
9. Maintain communication to plan power usage
10. If an employee is injured, administer first aid
11. Arrange escort of injured personnel to the nearest Trauma Center/Hospital

Fire

Grass Fires On-Site

1. Report grass fires to supervisor and the Fire Department
2. If the fire occurs on the facility site, contain and extinguish the fire using the Plant water and/or fire extinguisher

3. If the fire spreads to surrounding property, off the Facility site, notify the Fire Department
4. Administer first aid to injured personnel and evacuate to the nearest Trauma Center/Hospital

In Plant Fire

1. In the event of fire, evacuate the facility immediately. **DO NOT** try to save anything.
2. **SAVE YOURSELF.**
3. Initiate an alarm immediately. From a non-involved structure CALL 911, or contact
4. All personnel should evacuate immediately to a designated meeting site.
5. Shut all doors behind you on your way out of the building. Shutting doors will prevent the immediate spread of the fire to other parts of the building. This will give the Fire Department a few extra minutes to deal with the fire.
6. Supervisors should call roll at the designated meeting site to make sure that every employee is present and accounted for.

Flood

Flooding Due to Mechanical or Electrical Failure

Electrical Vaults and Pull boxes:

1. Notify Water/Sewer Superintendent
2. Turn off all electrical power into and out of the vault before entering or placing a pump in the area. Check for available electrical drawings.
3. Determine the cause of the flooding and repair.
4. Set up portable pump to clean out the affected area.
5. Do not attempt to return equipment to service until it has been thoroughly inspected by qualified personnel.

Pump rooms and stations:

1. Notify Water/Sewer Superintendent
2. Turn off all electrical power before entering the area
3. Determine the cause of the flooding and repair
4. Have area inspected by qualified electrician

Buildings:

1. Notify Water/Sewer Superintendent
2. Turn off all electrical power before entering the area
3. Open doors to allow water to drain as possible
4. Check sump pumps and floor drains for blockage
5. Locate cause of flooding and repair
6. Have area inspected by qualified electrician before restoring equipment to service

Flooding Causes by Natural Disaster

1. Notify Water/Sewer Superintendent
2. Fill Sandbags and sandbag doorways, electrical panels, pullboxes, and other equipment as necessary if there is adequate time
3. Turn off all electrical service, natural gas and potable water service to the affected area
4. Evacuate the area until flooding has receded or pumping operations are complete
5. Notify **Outside Equipment Vendor** so that heavy equipment can be brought in for repairs
6. After repairs are made and flooding subsides, pump out affected areas
7. Make necessary repairs and have all equipment thoroughly inspected before returning to normal service

Inspections (Fire and Police)

On an annual basis, at a mutually convenient time, the Water/Sewer Superintendent or his/her designate shall arrange to have the Facility inspected by appropriate authority for security and fire safety.

During these inspections, Fire Department officials should inspect the Facility for unsafe conditions, adequacy of fire prevention equipment, and adequacy of safety equipment. Fire Department officials should be informed that chlorine and other potentially dangerous materials are stored and used on-site as part of the routine operation of the facility.

Police officials should inspect the Facility for overall security and unsafe conditions. They to should be informed that chlorine and other potentially dangerous materials are stored and used on-site as part of the routine operation of the Facility.

The recommendations following these inspections are important in maintaining and up grading the safety and security of the Facility and the employees. Every effort should be made to correct inadequacies or implement improvements discovered during these inspections.

Lightning/Electrical Storm

1. If power to the plant is disrupted, transfer of power from the emergency generator should be automatic: check that this occurs.
2. Contact your supervisor
3. Seek shelter away from windows and doors and metal objects that may act as "ground"
4. Do not stand in water
5. Administer first aid to injured personnel
6. Evacuate injured personnel to the nearest Trauma Center/Hospital
7. Inspect the plant for damage
8. Report all damaged to your supervisor.
9. Contact the power company to determine the approximate length of the power outage
10. When power is restored, transfer power back to main circuits
11. Report any bypass or non-complying discharge to regulatory authority

Mechanical/Equipment Failure

1. Substitute redundant unit(s) where applicable
2. Notify supervisor
3. Complete a work order
4. In the event off mechanical or electrical failures, at the wastewater plant or the lift station, the SCADA system sends an alarm to the on-call personnel.

ON CALL 505-839-5653 NOTIFIED until acknowledged succession list in Appendix G

Power Failure

Notify supervisor

Notify power and telephone companies

Use generators where possible

When line power is restored, transfer power from line to plant circuits

Personal Injury

First all personnel should take some precautionary measures to try and prevent injury to themselves and their co-workers.

Chemical injury

1. Wash away immediately with large amounts of cool running water, using the appropriate source.
2. Eyewash stations, emergency shower or faucet (flush for no less than 15 minutes).
3. Remove clothing from the affected areas of the body if needed (discard contaminated clothing properly).
4. If first aid for specific chemicals is close, use them (read MSDS for proper first aid treatment).
5. Get medical attention if needed

Slight General Injuries

1. A small cut, bruises, burns, insect stings, etc...
2. Follow Village of Los Lunas injury reporting protocol.
3. If more than first aid is needed transport to Hospital
4. Report to supervisor as soon as possible

Repair Priorities WWTP AND IN THE EVENT OF LIFTSTATION SPILLS/Sewer Overflow

Repair Priorities in the event of damage to the Facility are directed at achieving progressively higher degrees of treatment. It is important to restore a high degree of treatment as soon as possible.

1. Restore electrical power.
2. Restore raw wastewater lift station (PIP).
3. Restore bar screen.
4. Restore effluent disinfection.
5. Restore secondary treatment.
    A. Blowers
    B. Telephone system

Spill Response Plan

Official Notification as required by NMED

The NMED's website (http://www.nmenv.state.nm.us/gwb/nmed-gwqb-NotificationofSpillsandUnauthori.htm) provides the following questions/answers for addressing spill reporting.

Who Must Provide Notification?

The owner, operator, or person in charge where a discharge has occurred must provide notification of the release to the New Mexico Environment Department.

What Kinds of Discharges Must be Reported?

A discharge of any material in a quantity that may, with reasonable probability, injure or be detrimental to human health, animal/plant life, or property; or may unreasonably interfere with the public welfare or the use of the property must be reported. This includes chemicals, biohazard materials, petroleum products, and sewage. In addition to recent spills, the discovery of evidence of previous unauthorized discharges, such as contaminated soil or ground water, also must be reported.

If you are unsure whether or not you should report a particular release, it is better to err on the side of caution and report it.

When Must Notification Be Provided?

Verbal notification must be provided to NMED as soon as possible after learning of a discharge, but in no event more than twenty-four (24) hours thereafter.

What Information Must Be Provided?

When you contact NMED, be prepared to provide the following information (to the best of your knowledge):

1. the name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility;
2. the name and address of the facility;
3. the date, time, location, and duration of the discharge;
4. the source and cause of discharge;
5. a description of the discharge, including its chemical composition;
6. the estimated volume of the discharge; and
7. any actions taken to mitigate immediate damage from the discharge.

Who Must You Notify? For spills involving facilities operating under ground water Discharge Permits, contact the permit reviewer directly or contact the Ground Water Quality Bureau at 505-827-2900 (during normal business hours only). For all other situations, use the emergency and non-emergency 24-hour numbers below.

For emergencies, call 505-827-9329

(24 hours a day)

For non-emergencies, call 866-428-6535 (voice mail, 24 hours a day).

For non-emergencies, and to reach an on-duty NMED staff member during normal business hours, call 505-476-6000.

Village of Los Lunas

LIFT STATION

DATE	PUMP I HOURS	PUMP II HOURS	TIME	REMARKS	STAND BY WORKER

Small Community, Big Possibilities

Village of Los Lunas

WELL #

DATE	METER READINGS	GPM	TANK LEVEL	TIME	REMARKS	STAND BY WORKER
	0					
	0					
	0					
	0					
	0					
	0					
	0					
	0					
	0					
	0					
	0					
	0					
	0					
	0					
	0					
	0					
	0					
	0					
	0					
	0					

Village of Los Lunas
Arsenic Treatment
Daily Operations Log

Well No. _____

Date-Time _____

Operator:		
Bypass Reading		**BP Flow**
Backwash Reading		**BW Flow**

Raw Water Values	**Once A month**	
Date of Test		
Arsenic		ppb
Iron		mg/L

Filter Influent Values			
Parameter	**Target**	**Current**	**Units**
Free Cl2	0.6 - 0.8		mg/L
Iron	2.8 - 3.2		mg/L
Raw pH	6.5 - 6.9		su

Filter Effluent Values			
Parameter	**Target**	**Current**	**Units**
Arsenic on Wednesday	<1		ppb
Free Cl2	0.1 - 0.2		mg/L
Iron	0.01 - 0.03		mg/L

Finished Water Values			
Parameter	**Target**	**Current**	**Units**
Arsenic	7		ppb
Free Cl2	.25 - .40		mg/L
Iron	0.01		mg/L
Finished pH	7.00 or higher		su

Comments: _____

Backwash Schedule	
Day&Time of Last BW	

Headloss	

Chlorine Feed Information	
Feed Rate (lbs/Day)	
Dosage mg/L	

Ferric Chloride Information	
Inches	
Stroke Frequency %	
Dosage mg/L	

Hydrochloric Acid Information	
Inches	
Stroke Frequency %	

Village of Los Lunas

Small Community, Big Possibilities

WATER DEPT. ON CALL NUMBERS

Operator	Phone #	Access code	Ack. code
On call phone	839-5653	10	9
Charlie Owens	991-0696	80	9
Ray Vigil Jr.	697-9840	20	9
Kevin Mireles	238-3664	50	9
JW Sanchez	328-0707	70	9
Isaac Jaramillo	389-6890	40	9
Daniel Blea	401-7592	99	9
Larry Rivera	480-9216	60	9
Scott White	363-1235	90	9
Ray Vigil	363-0847	30	9

Appendix G

Public Information Flyer

Village of Los Lunas
Source Water Protection Plan

Drinking Water Bureau

Daniel B. Stephens & Associates, Inc.

What is the Source Water Protection (SWP) Program?

The SWP Program is a voluntary program for water systems that is funded through New Mexico Environment Department Drinking Water Bureau (NMED DWB). It allows communities to assess their water system to identify and manage actual and potential sources of contamination.

What is the purpose of developing a SWP plan?

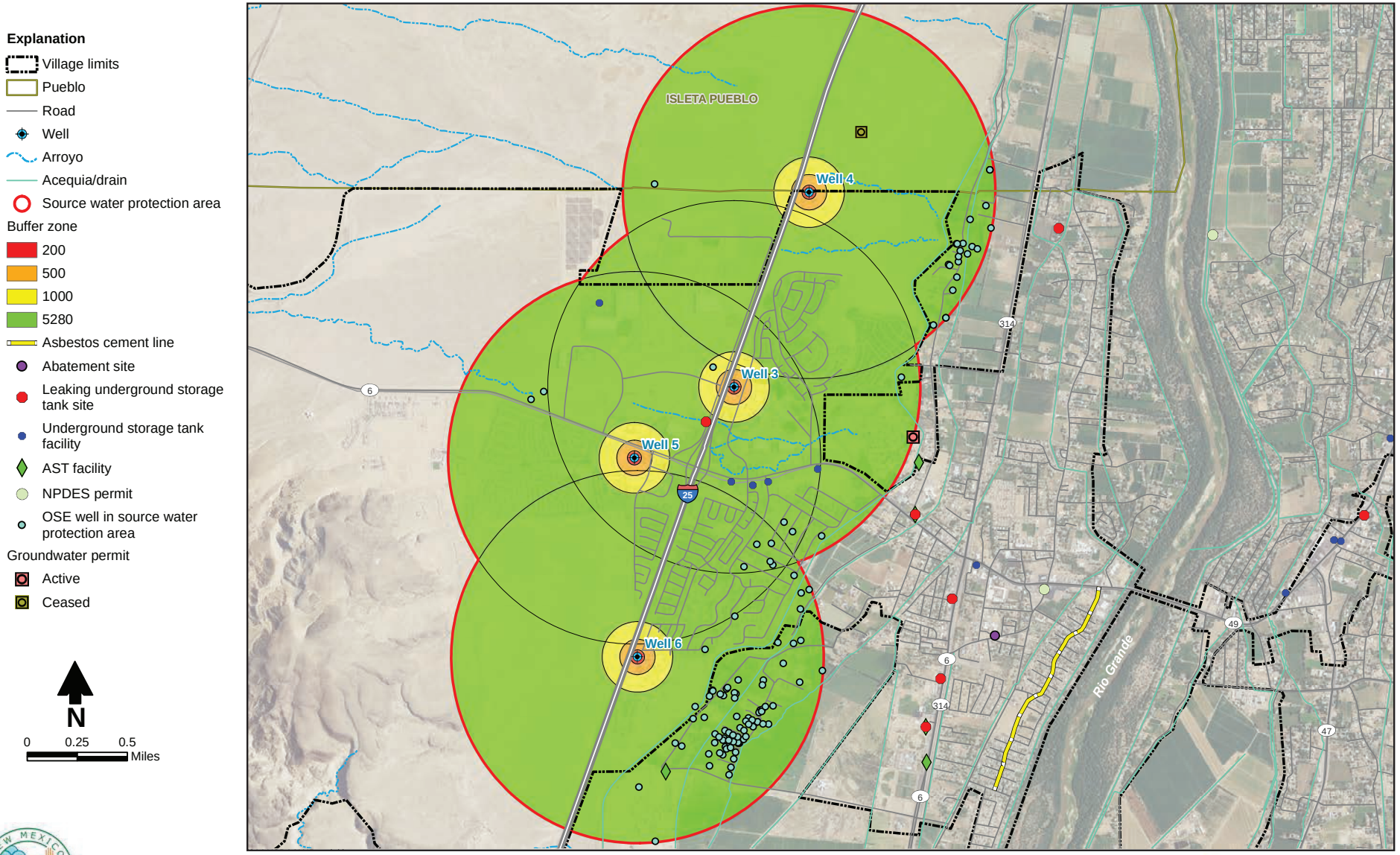
The purpose is to protect drinking water sources before they become contaminated. Preventing contamination is less expensive and easier than cleaning up a contaminated water source or finding a new source.

How can I help prevent contamination?

- Report potential sources of contamination to the Village of Los Lunas by calling (505) 839-3841.
- Properly maintain your septic tank by having it inspected and pumped regularly. Avoid putting chemicals down the drain so as to not kill the beneficial bacteria at work in your septic tank.
- Properly maintain private wells. Private wells pull water from the same aquifer as the municipal wells and can act as a conduit for hazardous materials if not maintained correctly.
- Be aware of chemical use on your property. Runoff can contaminate drinking water sources.
  - Use proper yard maintenance practices. Do not over-fertilize or over-apply pesticides.
  - Dispose of old chemicals, gas, and oil properly; do not dump these materials onto the ground.
  - Do not burn hazardous materials.

For more information about the SWP Program, visit www.env.nm.gov/dwb/water_protection

The Source Water Protection Area (SWPA) is defined as a one-mile radius around each wellhead. Potential sources of contamination (PSOCs) are defined as any possible site or event that could, under any circumstance and time frame, lead to contamination of the water system's sources. Not all sites identified as PSOCs pose the same level of threat. Arsenic is a naturally occurring contaminant in the Los Lunas SWPAs; there are seven different types of human-caused PSOCs in the SWPAs, including private wells, acequias, septic tanks, gasoline stations, and transportation corridors.



With input from NMED, Daniel B. Stephens & Associates, Inc. has prepared a Source Water Protection Plan for your provider dated January 2017. Contact the Village of Los Lunas if you wish to review a copy.

Drinking Water Bureau

DBS&A
Daniel B. Stephens & Associates, Inc.