City of Santa Fe

Agenda

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Santa Fe River Commission Agenda
Thursday, August 10, 2017 (Round House Room), 6 pm to 8 pm
City Offices at the Market Station Building at the Railyard
500 Market Street, Suite 200, Santa Fe, NM
505-955-6840

1. **ROLL CALL**
2. **APPROVAL OF AGENDA**
3. **APPROVAL OF MINUTES FROM JULY 13,2017**
4. **COMMUNICATION FROM OTHER AGENCIES /COMMITTEES**

5. **INFORMATION/DISCUSSION/ACTION:**
   a) **MS4 Cooperative—Goals and Objectives of the New Permit (Jerry Schoeppner)**
   b) **Discussion of a "Scoop the Poop" campaign (Melissa McDonald)**
   c) **River Commission Priorities & Goals Review (Zoe Isaacson)**

6. **MATTERS FROM COMMISSIONERS**

7. **MATTERS FROM STAFF**
   a) **Projects Status Report –EPA Stormwater Pilot Project**
   b) **Draft Source Water Protection Plan**
   c) **SF River Fund Donation Form Update**
   d) **Project Updates**

8. **CITIZENS' COMMUNICATION FROM THE FLOOR**

9. **SUB-COMMITTEE BREAKOUT SESSION**
   - **Outdoor Economy**
   - **Promoting a Living River**
   - **Watershed Revitalization**
   - **Species Resiliency**

10. **ADJOURN**

Next Scheduled River Commission Meeting is September 14, 2017
Captions & Packet Material are due by 10 am on Tuesday, September 6, 2017
Persons with disabilities in need of accommodations,
Contact the City Clerk's office at
(505) 955-6521 five (5) working days prior to the meeting date.

Santa Fe River Commission
Meeting Index
August 10, 2017

Title	Description	Page
Cover Sheet		0
Call to Order	The meeting of the Santa Fe River Commission was called to order at 6:01 p.m. at 500 Market Station (Railyard Station), Santa Fe, NM.	1
Roll Call	A quorum was present	1
Approval of the Agenda	Chair Buchser would like to add a discussion about the Field Trips and the SF Water Reuse Feasibility Study. Ms. Hansen moved to approve the agenda as amended with a second from Mr. Pierpont which passed by voice vote.	1
Approval of Minutes from July 13, 2017	*Corrections:* Page 1 Roll Call ~~Pierponte~~ change to Pierpont Mr. Jacobi moved to approve the minutes as amended with a second from Ms. Hansen which passed by voice vote.	1,2
Communication from other Agencies/Committees		2
Information/Discussion/Action • MS4 Cooperative-Goals and Objectives of the new permit • Discussion of a "scoop the poop" campaign • River Commission Priorities and Goals Review • SF Water Reuse Feasibility Study • Field Trips	Discussion Only	2 2,3 3,4 5
Matters from Commissioners	Discussion Only	5
Matters from Staff • Project Status Report-EPA Stormwater Pilot Project • Draft Source Water Protection Plan • SF River Fund Donation Form Update • Project Updates	Discussion Only	5
Citizen's Communication from the Floor	Discussion Only	6
Sub-Committee Break Out Session- Working Meeting • Outdoor Economy • Promoting a Living River • Watershed Revitalization • Species Resiliency	Discussion Only	6
Adjourn	There being no further business to come before the Santa Fe River Commission Ms. Hansen moved to adjourn the meeting at 8:00 p.m. with a second from Ms. Doremus which passed by voice vote.	6
Signature Page		6

Santa Fe River Commission
Meeting Minutes-**August 10, 2017**
500 Market Street Santa Fe, New Mexico
6:00 p.m.-8:00 p.m.

CALL TO ORDER

The meeting of the Santa Fe River Commission was called to order at 6:01 p.m. at 500 Market Station (Railyard Station), Santa Fe, NM. A quorum was present.

1. ROLL CALL

Present
John R. Buchser, Chair
Phil Bové, Vice Chair
Luke Pierpont
F.M. Patorni
Anna Hansen
Jerry Jacobi
Dale Doremus
Emile Sawyer

Not Present/Excused
Zoe Isaacson

Others Present
Melissa McDonald, City of Santa Fe Staff
Jerry Schoeppner, Santa Fe County
Andy Otto, Executive Director Santa Fe Watershed Association
Bob Findling, The Nature's Conversancy
Linda Vigil, Stenographer

2. APPROVAL OF THE AGENDA

Chair Buchser would like to add a discussion about the Field Trip and the SF Water Reuse Feasibility Study.

MOTION: Ms. Hansen moved to approve the agenda as amended with a second from Mr. Pierpont which passed by voice vote.

3. APPROVAL OF MINUTES FROM July 13, 2017

Corrections:

Page 1 Roll Call ~~Pierponte~~ change to Pierpont

MOTION: Mr. Jacobi moved to approve the minutes as amended with a second from Ms. Hansen which passed by voice vote.

4. COMMUNICATION FROM OTHER AGENCIES/COMMITEES

There was not any reports from other agencies or committees.

5. INFORMATION/DISCUSSION/ACTION:

- **MS4 Cooperative-Goals and Objectives of the New Permit**

Mr. Schoeppner from Santa Fe County presented a slideshow on the MS4 project. (See Exhibit A)

Ms. Hansen asked who the partners are. They are City of Santa Fe, SF County, and NMDOT.

Chair Buchser asked when the NOI is released then 4 months to comment?

Ms. McDonald are already making pamphlets that are all streamlined.

Ms. Doremus asked about the sampling plan. Mr. Schoeppner they will looking at different reaches and the standards for each ones. They will place the testing points in certain areas in the reach.

Ms. Doreums is it based on stream standards. Mr. Schoeppner stated yes and they will run it through NMED first.

Ms. McDonald stated they visited the points and wanted to make sure they don't overlap.

Mr. Schoeppner there is compliance and this is data driven.

Ms. Doremus is it connected to the TMDL. Mr. Schoeppner yes they have been in contact.

Mr. Jacobi asked about the trash and how do they fit it? Ms. McDonald stated the reports from the Watershed Assoc. is included in it. There is some discussion for credits and acknowledgement for the extra work.

Ms. McDonald discussed the trash traps that will collect the floatable trash. The upper reaches are clean but the lower reach has collected a lot.

Mr. Patorni is there is a connection between the trash and the recycling increase?

Ms. Hansen announced the SWMA meeting and that could be a question for them. Mr. Bove explained the County is proactive in finding illegal dumping.

- **Discussion of a "Scoop the Poop" Campaign**

Ms. McDonald explained the timely issue of the E.coli contamination it is a TMDL issue for the City. Wanted to check in and encourage the group to look into this. (*Pamphlet on overhead projector*)

Ms. McDonald sees it happening often. This needs to be solved, the best way is to work with groups and educate them on why it is an issue. It could have a positive effect. The water conservation committee was funded to publish some other pamphlet and will send it electronically. Perhaps a video could be made.

Ms. Hansen is supportive of this project. Would like it to mention all water ways.

Ms. McDonald explained the MS4 group will get credit for this.

Chair Buchser explained his wife posted a sign in their neighborhood and that has helped.

Ms. Hansen recalls the City of Albuquerque had a similar campaign. A discussion was held on where they can post the information.

Ms. McDonald would like them to review the pamphlet and then place it on another agenda.

Mr. Patrorni asked what the consequences are of the E.coli. Ms. McDonald explained the reasons and different pollutants.

Ms. McDonald will put it on the October agenda. Chair Bucsher asked how effective the bags have been. Ms. McDonald explained the staff assigned to stocking the stations with the Parks division.

Mr. Findling mentioned some neighborhood associations also set up the stations.

Mr. Bucsher briefly discussed the DNA testing.

Ms. McDonald also mentioned other animals that may be contributing to the problem.

- **River Commission Priorities & Goals Review**

Ms. McDonald sent it out for the members that weren't present at the last meeting. They had decided to leave it on the agenda for a while. It is a living document so that it can be changed as needed.

Ms. McDonald asked if it was ok to place on the web when she advertises it. Ms. Doremus mentioned a date should be added. Ms. McDonald asked for input on the website page if there are any ideas for design they can let her know.

- **Santa Fe Water Reuse Feasibility Study**

Chair Buchser discussed the idea of the feasibility study. The consultant disposed certain alternatives for aquifer storage. Lately the strategy by the consultant is to take water from the Waste Water Treatment Plant and send it to the river and get return flow credits. At this time they don't get credits unless the water reached the Rio Grande.

Chair Buchser explained the criteria used by the consultant, there were some things missing. The cost was high, the bureau of reclamation had funds for it. There was an informational meeting to review the plan. The living river flow was at risk because of other needs. The City is moving quickly on the recommendation from the consultant. He is concerned the reduction of the water supply and treated the Buckman facility as a source of water. Chair Buchser explained LANL's close proximity. The list of criteria is long.

Chair Bucsher discussed a collaboration with the county hasn't been looked at. It should go before the Buckman board. The board is an advisory board they cannot make decisions. There was a contract issued to further study the alternative, the City is actively moving ahead.

Chair Bucsher discussed the amount of water. They will need an Environmental Impact Report. The public has not been able to go through the process. There is a deadline next Thursday. Chair Bucsher believes in protecting the living river. Chair Bucsher discussed options he thought would work better. The consultant may have disposed of the alternative because the permit might be complicated.

Chair Bucsher discussed the growth of the City.

Ms. Hansen corrected the Buckman Diversion Board does make decisions they are not an advisory board.

Ms. Hansen stated the logo shouldn't be used on the information.

Ms. McDonald explained the City Staff would've been present had this item been on the agenda.

Chair Bucsher asked the Commission that since it was not on the agenda, he would like a more complete analysis on the alternative. He doesn't believe they looked into it enough. How would the Commissioners like to proceed?

Ms. McDonald stated the Commission can write a letter to City Council. It was discussed how the letter can be written and how input can be given without violating the Open Meetings Act.

Ms. McDonald explained that the item can be placed on the next agenda or a special meeting can be held for this item.

Chair Bucsher explained the amount of water that flows downstream. Ms. Hansen explained the residents downstream and the purple pipe.

Ms. McDonald restated the option, she will get the Chair in touch with some City Staff that can help him.

Ms. Hansen the City has asked the County to sign on to this but they are not interested in working on the Regional Water Plan. Chair Bucsher explained he likes to have the communication working.

Mr. Williams explained the alternatives are complicated but the River Commission understands the basics. The idea is to taking local water and becoming more depending on San Juan Chama water. It is less reliable and uses more energy.

Ms. Hansen discussed the 4% growth.

Chair Bucsher will follow the path. Ms. McDonald will recommend the City Staff he should work with.

- **Field Trips**

Chair Bucsher asked if the Commissioners would like to schedule some outings. Ms. McDonald recommend the Waste Water Treatment Plant. Ms. Hansen would like to visit the dams.

Ms. McDonald states they can be special meetings held off site.

Mr. Bove would like to see where the water is measured coming out of McClure and then end at the Water Treatment Plant. Ms. McDonald the time and staff and will need to organize.

A discussion was held about the locations of the outings.

6. MATTERS FROM COMMISSIONERS

All items discussed above.

7. MATTERS FROM STAFF

- **Project Status Update-EPA Stormwater Pilot Project**

Ms. McDonald the Stormwater management plan is starting a revision. In mid-September they are meeting with several divisions. After that, the EPA will be coming at the end of September there will be a public open house. There will be an announcement soon. They will be working to formulate broad goals and objectives.

Ms. McDonald stated there will be a tour of the problem spots in the City.

- **Draft Source Water Protection Plan**

Ms. McDonald only heard from Ms. Isaacson with comments. She will need to let them know soon. (See Exhibit C)

Ms. Doremus will send her comments in.

- **SF River Fund Donation Form Update**

Ms. McDonald explained the solution to the problem. The text was put back on the water bill. (See Exhibit D)

- **Project Updates**

Ms. McDonald will update at the next meeting. She will inform them of the new RFP's.

Mr. Pierpont asked about the work at the Raingardens. Ms. McDonald stated Youthworks did some work on them.

Ms. McDonald discussed the comments on the invasive species on the River. There needs to be a management plan. She has received several calls about the work being done to remove them.

Chair Buscher asked where the groups meet on the flyer for the free workshop (See Exhibit E).

8. CITIZEN'S COMMUNICATION FROM THE FLOOR

There were not any public comments.

9. SUB-COMMITTEE BREAKOUT SESSION

- **Outdoor Economy**
- **Promoting a Living River**
- **Watershed Revitalization**
- **Species Resiliency**

10. ADJOURN

There being no further business to come before the Santa Fe River Commission Ms. Hansen moved to adjourn the meeting at 8:00 p.m. with a second from Ms. Doremus which passed by voice vote.

SIGNATURES

John A. Buchser

John Buchser, Chair

Linda Vigil, Stenographer

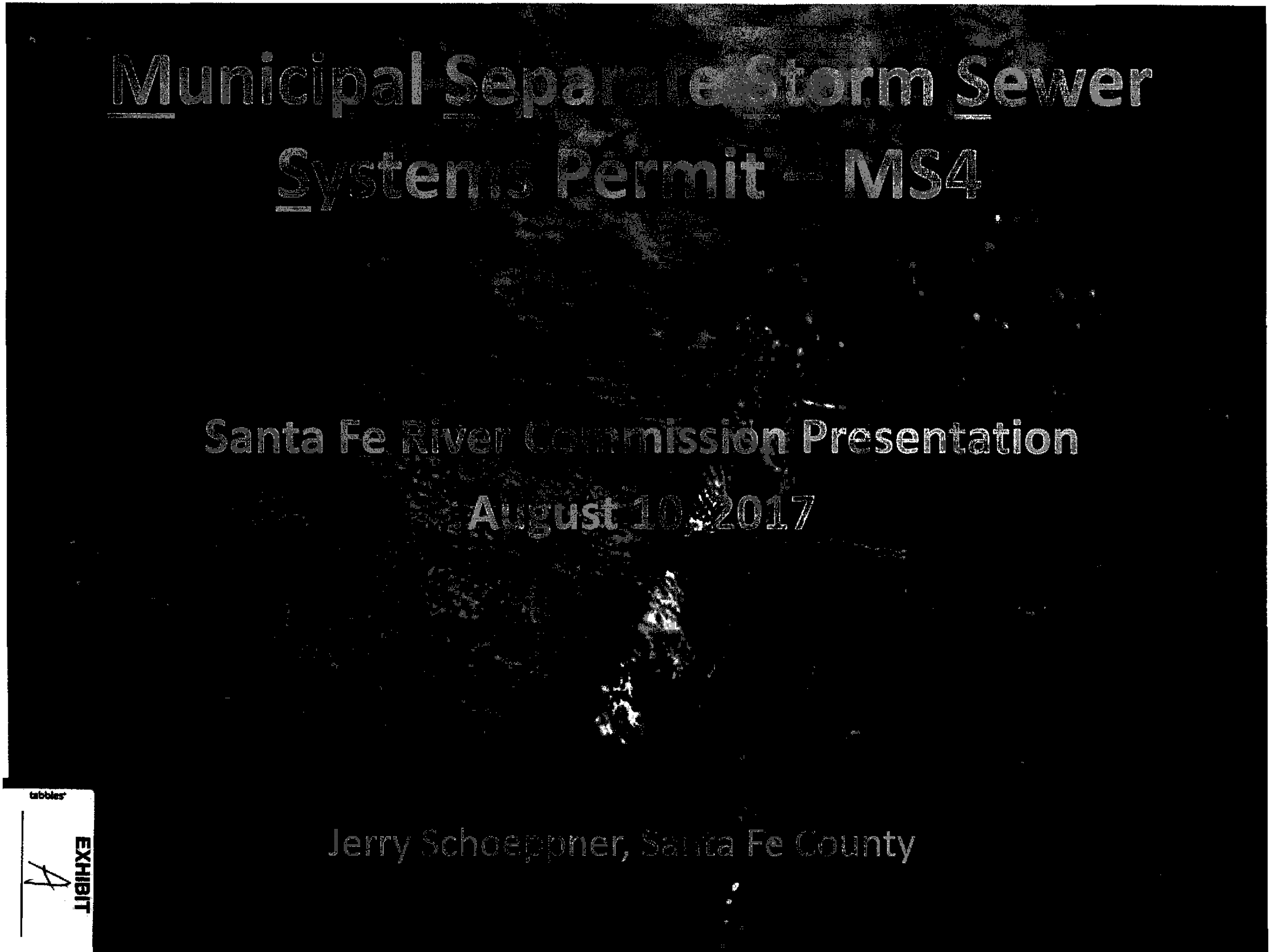

Municipal Separate Storm Sewer Systems Permit – MS4
Santa Fe River Commission Presentation
August 10, 2017
Jerry Schoeppner, Santa Fe County

EXHIBIT
A

Clean ... /MS4 ...

1899 - Refuse Act

1948 - Water Pollution Control Act (WPCA)

1956 – WPCA Amended (precursor to CWA)

1965 - Water Quality Act (precursor to EPA)

1970 – US EPA Created

1972 - WPAC Amended Clean Water Act NPDES

1987 - CWA Amended Created Stormwater Program

1990 - NPDES Established MS4 Program
Phase I – populations >100,000
Phase II populations < 100,000 (in Census Bureau designated UAs)

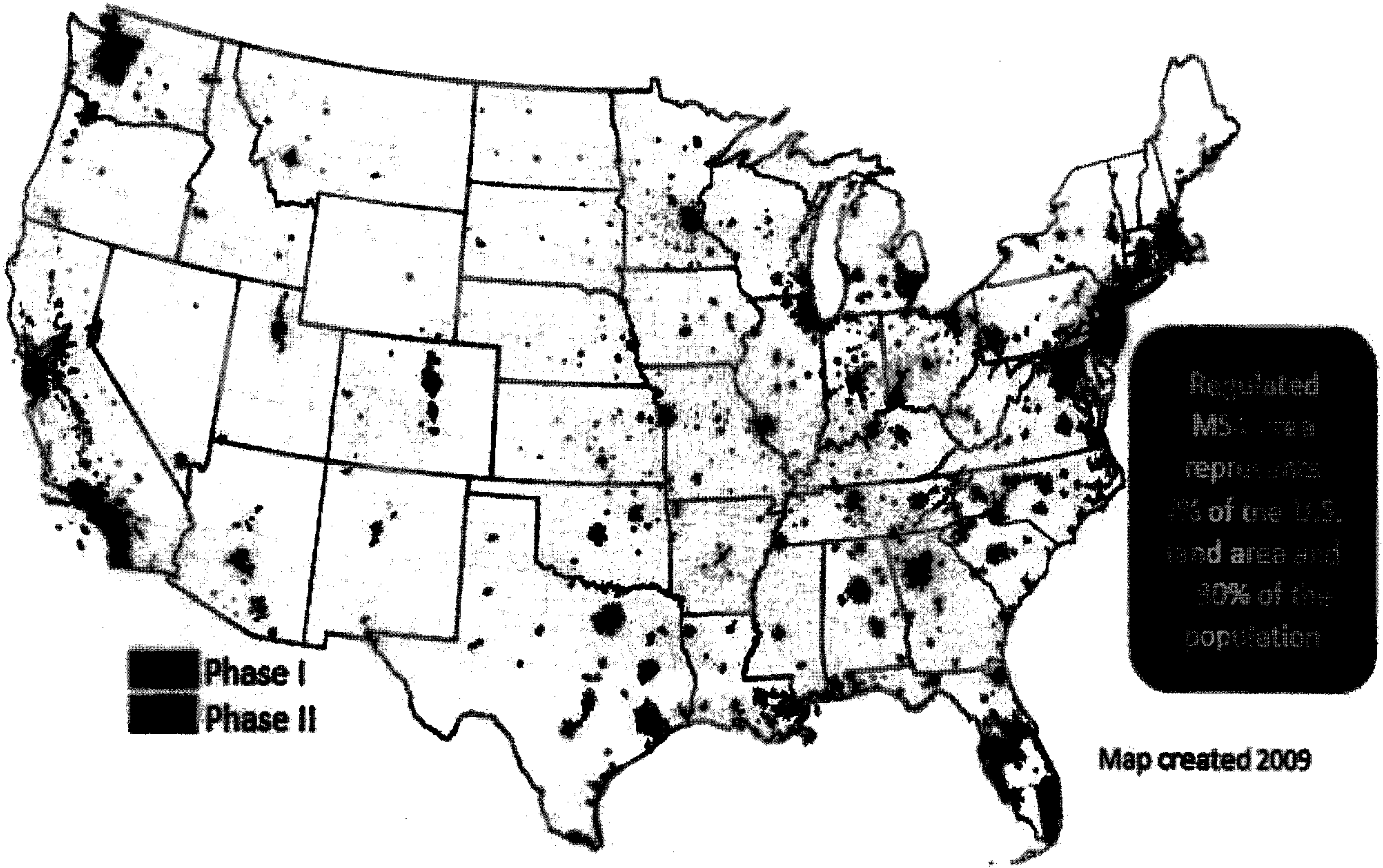
1900 1950 1960 1970 1980 1990 2000 2010 2020

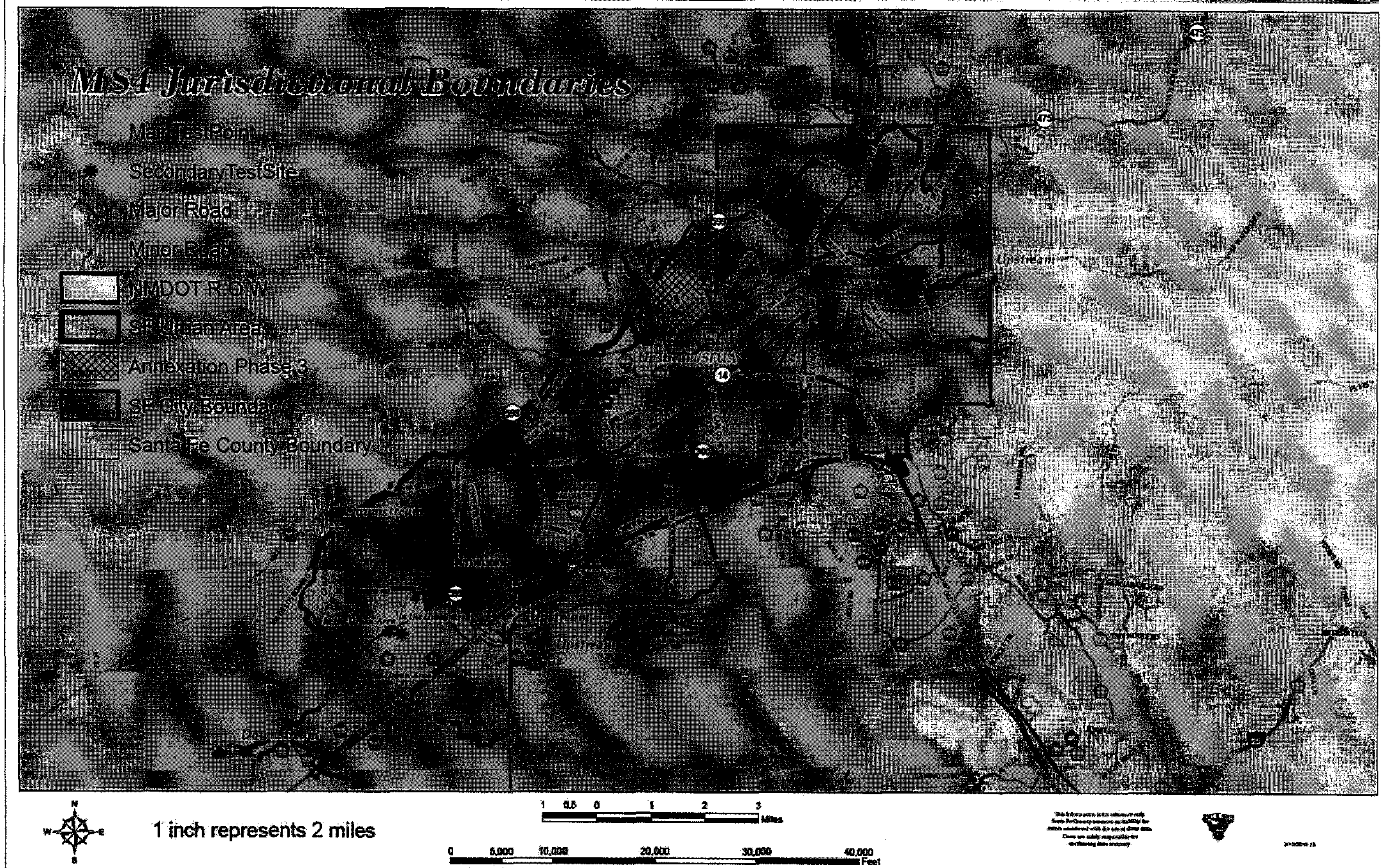
MS4 Permits in New Mexico

- Phase II Cities
  - Farmington/Aztec
  - Santa Fe
  - Las Cruces
  - Los Lunas
  - El Paso (includes portions of NM)

Purpose of the MS4 program is to establish requirements to reduce pollution carried by stormwater runoff.

National Map of Regulated MS4s



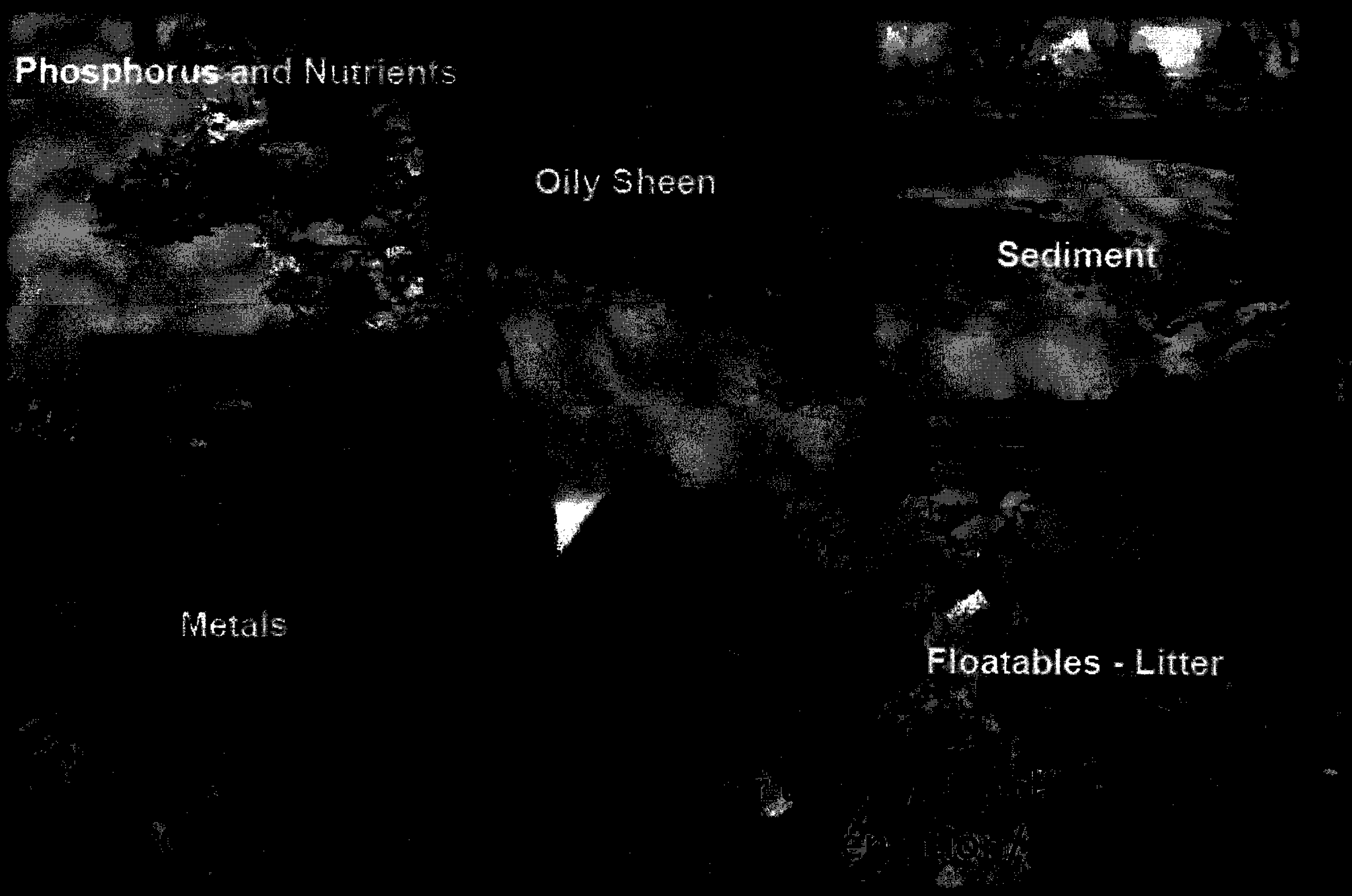


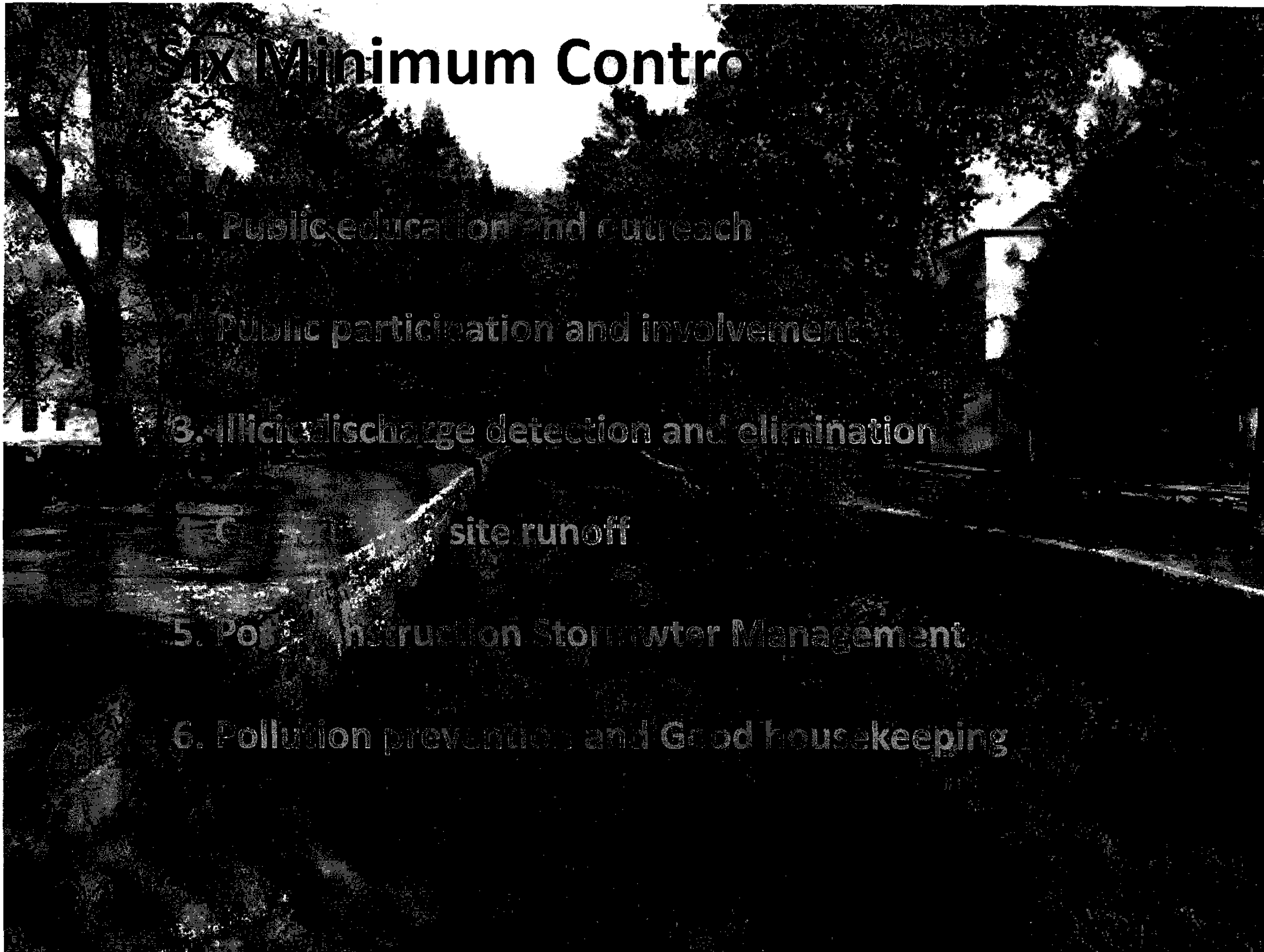
MS4 Jurisdictional Boundaries
MainTestPoint
SecondaryTestSite
Major Road
Minor Road
NMDOT R.O.W
SF Urban Area
Annexation Phase 3
SF City Boundary
Santa Fe County Boundary
Upstream
Downstream
N
W
E
S
1 inch represents 2 miles
1 0.5 0 1 2 3 Miles
0 5,000 10,000 20,000 30,000 40,000 Feet

Santa F[illegible] 4 [illegible] m[illegible]

- Draft State-wide permit issued July 2015, anticipate final permit in summer/fall 2017
  - NOI deadline, 90 days from permit issuance, 180 days for cooperative programs, each partner must submit separate NOI
  - Public comment period on each NOI
- Santa Fe River - Permitees: City of Santa Fe, Santa Fe County, New Mexico Department of Transportation – working cooperatively

What are Pollutants of Concern?





Six Minimum Contro
1. Public education and outreach
2. Public participation and involvement
3. Illicit discharge detection and elimination
site runoff
5. Post construction Stormwter Management
6. Pollution prevention and Good housekeeping

Long-term Goal/Objective: Support Santa Fe River Corridor protection and enahncement. Including the development of a 500 year flood mitiagtion plan, increased public awareness and scientific knowledge of the system.	
Subtasks:	Improve communication between River Commission/Governing Body/SF County
	Continue to guide governing body towards policies that help help the wetland within the SF Canyon Preserve maintain beaver ponds and incourage use of historic channel
	Encourage and help support City's study of aquifer recharge from LR planned release
	Encourage and help support City's study of stormwater (including their increased effort in catchment and benneficial use)
	Create/Support electronic library of SF River resources that in their entirety give a sound understanding of the basin and its complexity
	Support increasing river, arroyo & watershed signage
	Update for 1995 River Corridor Plan created by the SF River Commission
	Support beautifying efforts and events along the river corridor (Ex. adult event that coincides with fishing derby, art installations, fun and whimsical trash cans, painted porta-a-potties, etc...)
	Promote the SF River Fund
Long-term Goal/Objective: Advocate for intergration of water mangement between City and County to incourage a holistic approach to watershed management	
Subtasks:	Improve communication between River Commission/Governing Body/SF County
	Encourage Green Policies & Low Impact Development (LID) techniques such as rain gardens and bio basins
	as they relate to river and stormwater runoff
	Help create an overarching vision that goes along with sustainability
	Provide input 40 year plan-- long range water supply plan to ensure the river corridor and the watershed is protected
Long-term Goal/Objective: Continued Public Education and Outreach	
Subtasks:	Support public education campaigns regarding water quality, specifically the hazards of ecoli and how to prevent pollution (dogs and human waste) poop-to-scoop
	Improve communication between River Commission/Governing Body/SF County
Long-term Goal/Objective: In the wastewater reuse plan, support sending treated water into the vicinity of Frenchy's field and retain significant flows below wastewater treatment plant	
Subtasks:	Improve communication between River Commission/Governing Body/SF County

EXHIBIT
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B

DRAFT

City of Santa Fe Water System

Source Water Protection Plan

Public Water System # 3505126

Prepared for **City of Santa Fe, New Mexico**

March 17, 2017

EXHIBIT

C

Daniel B. Stephens & Associates, Inc.

6020 Academy NE, Suite 100 • Albuquerque, New Mexico 87109

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City of Santa Fe Water System
Source Water Protection Plan
Public Water System # 3505126

1. Introduction

This source water protection plan (SWPP) has been prepared by Daniel B. Stephens & Associates, Inc. (DBS&A) for the City of Santa Fe, New Mexico (the City) (Figure 1), under contract with the New Mexico Environment Department (NMED) Drinking Water Bureau (DWB).

The NMED DWB assists communities in the protection of their drinking water systems through the Source Water Protection Program. By participating in this voluntary 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 of developing and implementing a 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 easier and less expensive than cleaning up a contaminated source or finding a new source.

This SWPP for Santa Fe has been developed using the *New Mexico Source Water and Wellhead Protection Toolkit* (NMED DWB, 2013). The plan 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 City's Source Water Protection Area.

This SWPP has been developed through the cooperation of DBS&A, the City, the Source Water Protection Team, and NMED DWB. This document identifies actual and potential sources of

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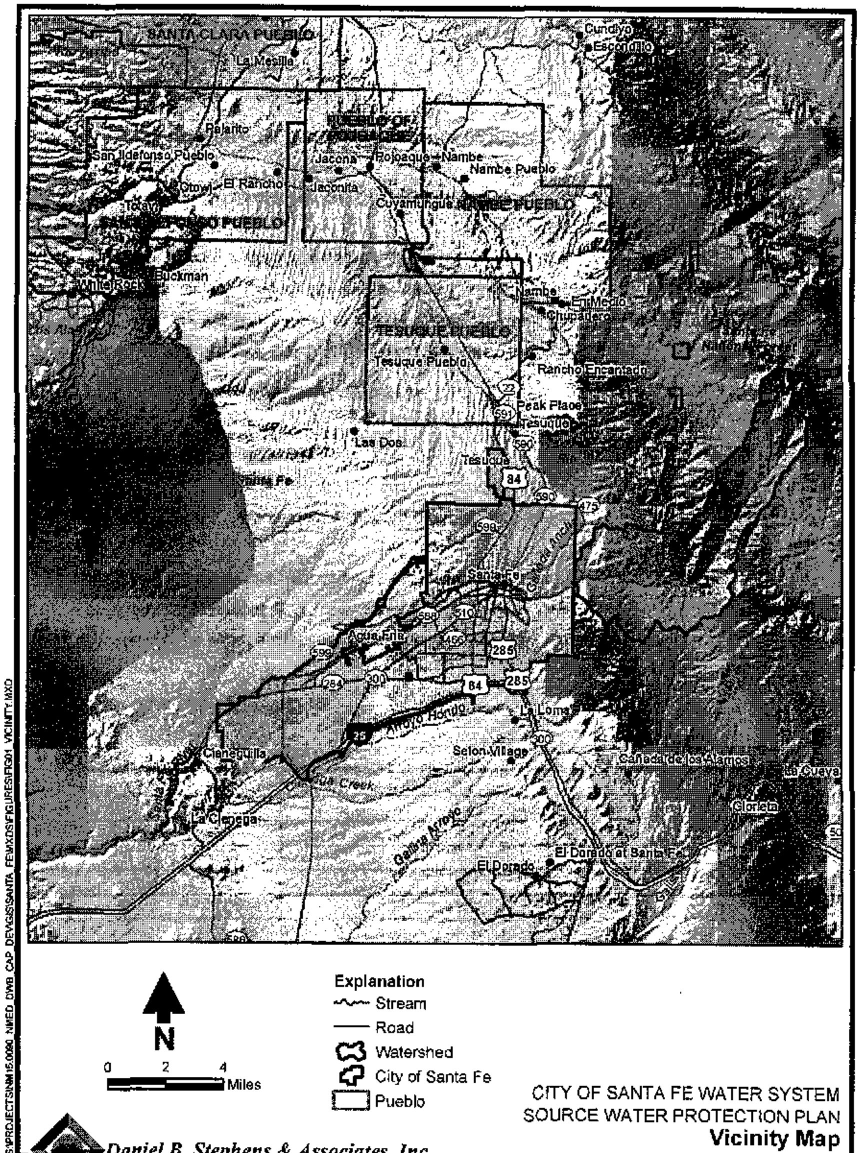

Figure 1

contamination to the City's water sources and makes recommendations for preventing future contamination. The City and the Source Water Protection Team are responsible for implementing the SWPP and updating the plan on a regular basis.

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 for all public water systems between 2002 and 2006. States are now implementing strategies to help local communities use the information obtained from these assessments. States may also provide resources to help fund local protection activities, such as wellhead protection programs for groundwater and watershed management programs for surface water. The source water assessment for the City of Santa Fe water system was completed in October 2003, and is provided as Appendix A.

2. Source Water Protection Team

The Source Water Protection Team has responsibility for input to the SWPP and implementation of recommendations of the SWPP. The NMED guidance recommends that the Source Water Protection Team include water system representatives, water consumers, and community stakeholders. Table 1 lists the members of the City of Santa Fe's Source Water Protection Team.

Table 1. Source Water Protection Team

Name	Affiliation	E-mail
Alex Puglisi	City of Santa Fe	aapuglisi@santafenm.gov
Alan Hook	City of Santa Fe	aghook@santafenm.gov

3. Water System Information

The City of Santa Fe water system serves approximately 78,000 customers (NMED, 2014). The majority of these customers, ??? , are within the City limits. However, the City also has the following water service agreements to serve customers within Santa Fe County (the County):

- Water service area boundary extension (WSABE) agreements
- Acéquia agreements
- The Las Campanas agreement
- City/County Water Resources Agreement
  - In 2005, the City and County signed the City/County Water Resources Agreement, whereby the City agreed to sell up to 500 acre-feet per year (ac-ft/yr) of wholesale water to the County in normal conditions and up to 1,350 ac-ft/yr in drought conditions. In 2015, the County purchased 105 acre-feet.

The City has two surface water and two groundwater sources:

- Surface water from the San Juan-Chama (SJC) Project via the Rio Grande
- Surface water from the Santa Fe River

- Groundwater from the Tesuque Formation
  - City Well Field (CWF)
  - Buckman Well Field (BWF)

Surface water from the Rio Grande is diverted at the Buckman Direct Diversion (BDD) and treated at the Buckman Regional Water Treatment Plant (BRWTP). These facilities are jointly owned by the City and the County, and are considered a separate water system from the City water system. Consequently, outside of the descriptions provided in this section, no further evaluation of BDD is included in this plan. For further source water protection information about BDD, reference the separate SWPP for BDD. All other sources are completely City-owned and operated, and are evaluated in this plan accordingly.

Table 2 lists the maximum daily capacity of each of the City's sources.

Table 2. Maximum Daily Capacity of City of Santa Fe Water Sources

Source	Maximum Daily Capacity (mgd)	Percent of Total (%)
Groundwater		
City Well Field	5.3	13.0
Buckman Well Field	12.4	30.5
Surface Water		
Canyon Road Water Treatment Plant	8.0	19.7
Buckman Regional Water Treatment Plant	15.0	36.9
Total	40.7	

Source: Brown and Caldwell, 2009
mgd = Million gallons per day

The sources are described in the following subsections.

3.1 Buckman Diversion

The SJC Project is a U.S. Bureau of Reclamation trans-basin transfer project that makes New Mexico's 11 percent allocation of Colorado River Basin water available to users in the north-

central part of the state (namely, the Middle Rio Grande Basin). This project diverts water from three different headwater streams of the San Juan River in Colorado (Rio Blanco, Little Navajo River, and Navajo River). Diversions can occur anytime during the year as long as stream flow exceeds the minimum allowable amount, and total diversions cannot exceed 1,350,000 acre-feet in any 10-year period (average annual yield of 96,200 ac-ft/yr). Diverted water travels underground for 27 miles across the Continental Divide into Heron Reservoir, located in Rio Arriba County, New Mexico at the confluence of Willow Creek and Rio Chama. The reservoir has a capacity of 400,000 acre-feet, approximately four years of supply for its designated downstream contractors (Table 3).

Table 3. Contractors of San Juan-Chama Project Water

Contractors	Annual Allocation (acre-feet)
Municipal	
Albuquerque	48,200
City of Santa Fe	5,230
Santa Fe County	375
Los Alamos	1,200
Los Lunas	400
Twining Water and Sanitation District	15
Española	1,000
Taos	400
Belen	500
Bernalillo	400
Jicarilla Apache Nation	6,500
San Juan Pueblo	2,000
Irrigation	
Middle Rio Grande Conservancy District	20,900
Pojoaque Valley Irrigation District	1,030
Other	
Cochiti Reservoir (U.S. Army Corps of Engineers)	5,000
Taos Pueblo Settlement	2,990

Water flows from Heron Reservoir southeast on the Rio Chama until it reaches the Rio Grande, approximately 5 miles north of Española (30 miles north of Santa Fe). City and County SJC water from the Rio Grande is diverted at the BDD and treated at the BRWTP. The City of Santa Fe operates all BDD facilities.

3.2 *City-Owned Sources*

The CWF consists of 7 wells within the City limits. These wells are located near the Santa Fe River. The City can produce 4,865 ac-ft/yr from the CWF (City of Santa Fe, 2015). The BWF consists of 13 wells located 15 miles northwest of the City limits. The Buckman wells are located near the Rio Grande. Buckman wells 1 through 9 were originally drilled in the 1970s, and Buckman wells 9 through 13 came online in 2003. The City can produce 10,000 ac-ft/yr from the BWF (4,000 ac-ft/yr from Buckman wells 1 through 9 and 6,000 ac-ft/yr from Buckman wells 10 through 13) (JSAI and City of Santa Fe, 2016). The City also has the Northwest Well, which is not part of either well field, but pumps directly to the 10 million gallon Buckman Storage Tank. Table 4 provides detailed information about the City's wells.

Water diverted from the Santa Fe River is stored in McClure and Nichols Reservoirs prior to treatment at the Canyon Road Water Treatment Plant (CRWTP). The City is permitted to divert 5,040 ac-ft/yr from the Santa Fe River and can store up to 3,985 acre-feet in the two reservoirs combined (City of Santa Fe, 2015). McClure Reservoir has a capacity of 3,257 acre-feet (1,061 million gallons); Nichols Reservoir has a capacity of 684 acre-feet (223 million gallons).

The City's distribution system consists of ?? miles of pipeline, 8 storage tanks, and 4 booster stations distributed among 12 pressure zones. Figure 2 shows the City's existing water system. Table 5 lists the infrastructure by pressure zone (NMED, 2014).

To offset the use of treated water, the City makes reclaimed water available for purchase. Reclaimed water is used for irrigation, dust control, construction, livestock purposes, the educational pond at the **New Mexico Department of Game and Fish (NMDGF) facility**, and maintaining stream flow. Of the 5,844 acre-feet (1,904 million gallons) of reclaimed water produced in 2015, 18 percent (342 million gallons) was reused and 82 percent (1,562 million gallons) was discharged into the lower Santa Fe River (City of Santa Fe, 2015).

Table 4. Well Information, City of Santa Fe Water System

Name	Status	Drill Date	Well Depth (feet)	Casing Depth (feet)	Casing Diameter (inches)	Static Water Level (feet bgs)	Date of Static Water Level	2011 Pumping Rate (gpm)	Pump Rated Capacity (gpm)	Pump Setting (feet)	Depth to Top of Screen (feet bgs)	Depth to Bottom of Screen (feet bgs)
City Well Field												
Agua Fria	Active	1951	740	740	18	238	1994		840	400	201	740
Alto	Active	1968	741	725	12.75	158	2003 SWA		250	509	228	720
Ferguson	Active	1970	828	750	14	137	2003 SWA		270	610	175	748
Osage	Active	1971	809	770	NA	89	2003 SWA		500	428	210	760
Santa Fe	Active	1951	1,523	725	16	219	2003 SWA		220	550	200	725
St. Michaels	Active	1983	800	797	16	217	2003 SWA		490	714	382	782
Torreon	Active	1997	1,230	1,230	18	211	2003 SWA		400	504	400	1,200
Other City Wells												
Acres Estates	Not equipped											
Country Club Estates												
Hickox	Not equipped											
North West	Active	1998	2,000	500	14.625				960	760	500	2,000
Buckman Well Field												
Well 1	Active	8/06/1977	1,097	1,093	16	188.5	May 2015	1,180	548	840	257	1,093
Well 2	Active	7/27/1977	1,593	1,473	16	107.12	May 2015	785	534	880	234	1,578
Well 3		Improved 1/23/1990	1,500	NA	18	138.67	May 2015	500	NA	NA	500	1,480
Well 3a		1995	1,500	1,490	1	385	2003 SWA		350	350	500	1,490
Well 4	Active	4/10/1972	1,219	1,219	16	73.65	May 2015	690	374	750	454	1,214
Well 5	Active	5/25/1972	1,182	1,182	16	154.51	May 2015	430	294	750	244	1,170
Well 6	Active	6/23/1972	1,154	951	16	138.45	May 2015	1,110	788	730	291	1,148
Well 7	Active	6/19/1990	1,415	700	16	167.06	May 2015	1,010	700	800	700	1,400
Well 8	Active	8/10/1990	910	380	16	30.95	May 2015	660	530	620	380	900
Well 9	Active	12/12/2002	1,383		16 / 12	181.10	May 2015	415			320	1,320
Well 10	Active	9/23/2003	2,018		18 / 14	334.97	May 2015	1,040			500	1,980
Well 11	Active	7/24/2003	2,020		16 / 14	396.41	May 2015	885			450	1980
Well 12	Active	7/07/2003	1,930		18 / 14	399.85	May 2015	810			400	1900
Well 13	Active	9/16/2003	2,018		18 / 14	315.41	May 2015	1,110			400	1980

bgs = Below ground surface
gpm = Gallons per minute
NA = Not applicable
SWA = Source water assessment

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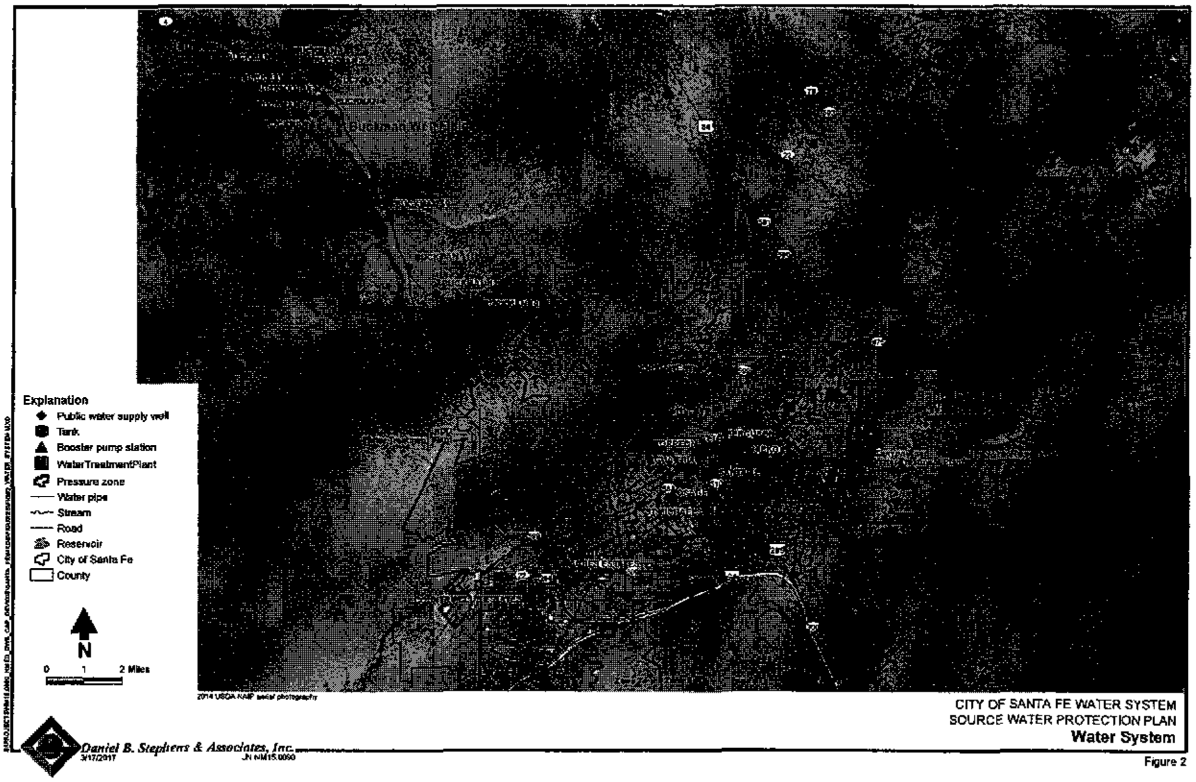

Figure 2

Table 5. Infrastructure by Pressure Zone

Pressure Zone 1 South	*Pressure Zone 4*
• McClure Reservoir	• City Well Field
• Nichols Reservoir	*Pressure Zone 5 (largest pressure zone)*
• Sangre de Cristo Water Treatment Plant	• West County Water System [a]
• 2 million gallon ground storage tank	• Southwest ground storage tank
• St. Johns ground storage tank	• Buckman Booster Station
• East high level ground storage tank	*Pressure Zone 6*
• East high level booster station	• No facilities
Pressure Zone 1 North	*Pressure Zone 7*
• No facilities	• No facilities
Pressure Zone 00 (Summit High Level)	• Contains part of the County South Sector Water System [a]
• Summit ground storage tank	*Pressure Zone 8*
Pressure Zone 0 (Summit Low Level)	• No facilities
• Dempsey ground storage tank	• Contains part of the County South Sector Water System [a]
• Summit booster station	*Pressure Zone 9*
Pressure Zone 2	• No facilities
• 10 million gallon ground storage tank	• Contains part of the County South Sector Water System [a]
• Hydro ground storage tank	
Pressure Zone 3	
• Hospital Ground Storage Tank	
• St. John's Booster Station	

[a] Independent water system that purchases water from the City from a master meter

4. Hydrogeology

4.1 Regional Hydrogeology

Santa Fe County is located between the Jemez Mountains to the west and the Sangre de Cristo mountains to the northeast. Both surface water and groundwater are available in the area.

The City obtains surface water from the Rio Grande and the Santa Fe River. The 2016 Jemez y Sangre regional water plan (NM ISC and OSE, 2016) provides the following description of rivers in the area:

> The Rio Grande, which drains south through the region from Embudo to Cochiti Reservoir, is the major surface water feature (Figure 3-1), although use of this water is limited by provisions of the Rio Grande Compact. . . The Rio Chama, which flows into the Rio Grande near the northwest boundary of the planning region, also contributes a significant amount of water to the region, much of it imported water from the San Juan-Chama Project. The Santa Fe River, which supplies a portion of the City of Santa Fe water supply, Galisteo Creek south of Santa Fe, and the Rio Nambe, Rio Tesuque and Pojoaque River north of Santa Fe are also important tributaries in the region. The quality of the surface water in the region is generally very good to excellent.

The City's website (City of Santa Fe, 2017) gives a more detailed description of the Santa Fe River watershed:

> The Santa Fe River which runs for 46 miles from the headwaters near Lake Peak (12,408 feet) to the confluence with the Rio Grande (5,220 feet) is the center point of the Santa Fe River Watershed. The total area of the watershed is 182,400 acres (285 square miles) with the upper watershed comprising approximately 10% of this area. As a tributary to the Rio Grande, the Santa Fe River Watershed falls within the much larger, 116.6 million acres (182,200 square miles) Rio Grande Watershed. The Santa Fe River was the reason humans came to this area several thousand years ago. It flowed freely from its headwaters to the Rio Grande until it was dammed in 1881.

The City obtains its groundwater from the Tesuque Formation, part of the Santa Fe Group aquifer. Spiegel and Baldwin (1963) provides the following description of the Tesuque Formation:

> The Tesuque formation of middle (?) Miocene to early Pliocene age, here named for the town of Tesuque, 5 miles north of Santa Fe . . ., consists of several thousand feet of pinkish-tan soft arkosic, silty sandstone and minor conglomerate and siltstone. . .
>
> In the Santa Fe area, the Tesuque formation is generally exposed north of the Santa Fe River, and it is best exposed along the north edge of the Santa Fe area. The Tesuque, which represents the greater part of the Santa Fe group in the Santa Fe area, rests with at least local angular unconformity on the volcanic rocks of Oligocene and Miocene (?) age and is overlain with angular unconformity by the Ancha formation. Although near its base the Tesuque includes sediments derived from Tertiary igneous rocks, it consists principally of debris from Precambrian rocks.
>
> The color of the Tesuque formation ranges from grayish orange to moderate reddish orange and light brown. The usual pinkish color is due largely to the predominance of reddish grains of microcline. Crossbedding is common, and molds of desiccation cracks have been noted on the under surfaces of sandstones that rest on siltstones. Cementation by calcium carbonate is common, and in many specimens the cement is crystalline. The conglomerate, which is coarse, is common near the mountain front but less common farther west, partly because in general the lower beds are exposed only near the mountains. Clay is present only in very small amounts, but silt and very fine sand form a large proportion of the unit. The sand in many of the sandstone beds is fairly well sorted.

All of the City's wells are deep, ranging in depth from 740 feet (Agua Fria well in the CWF) to 2,020 feet (Buckman Well 11). In general, deep wells are less susceptible to surface contamination events.

4.2 Water Sources

The CWF and BWF draw groundwater from the Tesuque Formation. The City uses surface water from the Rio Grande and the Santa Fe River.

4.2.1 Source Water Quality

The City reports the results of required water quality sampling to customers in the annual consumer confidence report (CCR). In addition to the required sampling, the City conducts voluntary monitoring of sodium, a secondary contaminant, at the CRWTP and the CWF. The CCRs for 2013, 2014, and 2015 are provided in Appendix B. The CCRs show the results of City testing for contaminants in comparison to maximum contaminant levels (MCLs). No MCL violations were noted for 2013, 2014, or 2015.

Los Alamos National Laboratory (LANL) is located in the City of Los Alamos, approximately 25 miles southwest of the City of Santa Fe. While ChemRisk (2010) found that "[t]here are no contributions from LANL groundwater to the Buckman well field," in an abundance of caution, the City in conjunction with LANL and NMED has monitored three of the BWF wells since 2001 for possible groundwater contamination from past activity at LANL. From the 2015 CCR (Appendix B) regarding possible LANL contamination:

> In cooperation with Los Alamos National Laboratory (LANL) and the New Mexico Environment Department, the City currently monitors Buckman Wells 1, 6 and 8 for LANL derived contamination on a quarterly basis. Samples are analyzed for radionuclides, general inorganic chemicals, metals, high explosives and organics. This repeat sampling has occurred during the years 2001 – 2015 and has indicated that Laboratory-derived radionuclides are not present in the Buckman Wells 1, 2, 6 and 8. The results do indicate detectable levels of radionuclides associated with natural sources. These wells are part of the 13 wells that make-up the Buckman Wellfield. When these wells are used, water from these wells is delivered to the Buckman Tank prior to distribution into the system.

Naturally occurring arsenic is found near the BWF. The MCL for arsenic is 10 micrograms per liter (µg/L). Five wells (Buckman wells 1, 9, 11, 12, and 13) had average total arsenic concentrations above the MCL in 2011 (Table 6). John Shomaker & Associates, Inc. (JSAI) (2012) wrote the following:

> Buckman 1, 6, and 9 are next to or in fault zones, and yield groundwater elevated with arsenic when compared to Buckman 2, 3, 4, 5, 7, and 8. Buckman 1 and 9 yield groundwater above the drink water standard for arsenic (Table 3). The most viable alternative of reducing arsenic

> concentrations from Buckman 1, 6 and 9 would be well replacement at locations away from the mapped fault zones (see Fig. 11). The replacement program should start with the well containing the highest arsenic concentration. There are no viable options for rehabilitating or replacing Buckman 11, 12, and 13.

Table 6. 2011 Average Arsenic Concentrations in the Buckman Well Field

Buckman Well	Average 2011 Total Arsenic Concentration (µg/L)
1	10.1
2	6.3
3	4.2
4	3.1
5	3.3
6	7.7
7	3.5
8	6.9
9	16.9
10	5.7
11	12.6
12	14.9
13	15.1

Source: JSAI, 2012

4.2.2 Measured Water Levels and Production Rates

Static water levels are reported in Table 4. Table 7 summarizes 2014 to 2016 production rates by source. Table 8 summarizes 2014 to 2016 production rates by month. Figure 3 and Table 9 provide monthly production for 2016 by water source.

Table 7. 2014-2016 Water Production by Source

Source	2014		2015		2016	
	acre-feet	% of Total	acre-feet	% of Total	acre-feet	% of Total
City Well Field			625	7.7		
Buckman Well Field			629	7.7		
Canyon Road WTP			3,509	43.0		
Buckman Regional WTP			3,403	41.7		
Total	8,564		8,167			

Source: City of Santa Fe, 2015
WTP = Water treatment plant

Table 8. 2014-2016 Water Production by Month

Month	Production (acre-feet)		
	2014	2015	2016
January		530	
February		467	
March		544	
April		721	
May		709	
June		866	
July		855	
August		899	
September		860	
October		713	
November		495	
December		508	
Total	8,564	8,167	

Source: City of Santa Fe, 2015

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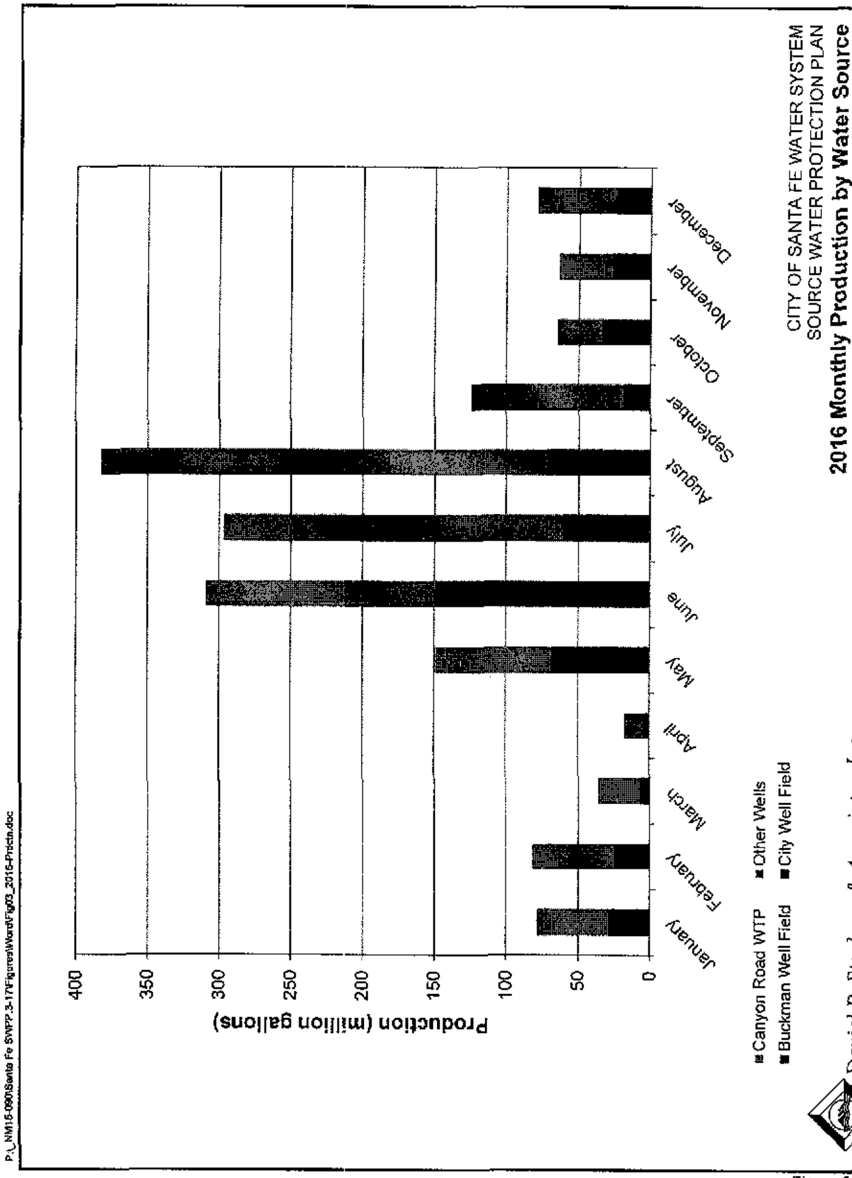

Figure 3

Table 9. 2016 Monthly Production by Source

Source	2016 Production (million gallons)											
	January	February	March	April	May	June	July	August	September	October	November	December
City Well Field	28.43	10.77	0.00	3.29	4.73	24.04	34.36	22.44	13.88	29.81	21.73	21.98
Buckman Well Field	0.00	13.88	7.05	0.00	63.69	125.22	26.62	49.19	4.71	4.09	4.83	2.08
Other Wells	—	—	—	0.10	0.11	0.27	0.13	109.49	2.59	6.68	0.16	0.02
Canyon Road WTP	50.19	57.13	29.41	14.35	80.50	159.71	235.57	201.70	103.15	24.27	36.94	55.11
Total	78.62	81.77	36.46	17.75	149.02	309.25	296.68	382.83	124.33	64.85	63.66	79.19

WTP = Water treatment plant

According to JSAI and City of Santa Fe (2016):

> Non-pumping water levels in BW1-9 have been rising since 2003 as total Buckman Well Field pumping has been decreasing and 28 percent of the total pumping has shifted to BW10-13 (Tables 3 and 4, Figs. 2, A2 through A10). Non-pumping water levels in BW10 are currently within a few feet of the initial 2003 measurement (Fig. A11). Non-pumping water levels in BW11-13 have not shown significant water-level declines over the past 5 years (Figs. A12 through A14). The observed stable trend for non-pumping water levels in BW10-13 is due to reduced pumping from the Buckman Well Field.

5. Water Supply Changes and Impacts

5.1 Historical Change and Impacts

BDD came online for the City in 2011, and has affected the City's water supply strategy. Since the BDD—a renewable and reliable surface water source—came online, it has provided the majority of the City's water supply. (Further discussion to be added for the final draft.)

In the last two decades, the City has made considerable progress in reducing its per capita use (Table 10). In 1995, the City's per capita use was 168 gallons per capita per day (gpcd); in 2015, it was 90 gpcd (a 46.4 percent decrease).

5.2 Need For Future Water Sources

The maximum daily capacity from all sources is 40.7 million gallons per day (mgd) (Table 2). In 2007, the City's average daily demand (ADD) was 8.7 mgd, and the maximum daily demand (MDD) was 13.8 mgd. In 2015, the ADD was ??? and the MDD was ???. Projected ADD and MDD for the years 2020 and 2030 are provided in Table 11. Based on these projections, the City has sufficient capacity to meet its water demand through 2030.

Table 10. Daily Per Capita Use, 1995-2015

Year	Daily Per Capita Use (gpcd)
1995	168
1996	134
1997	139
1998	142
1999	139
2000	137
2001	139
2002	115
2003	117
2004	101
2005	107
2006	105
2007	104
2008	105
2009	103
2010	104
2011	107
2012	106
2013	101
2014	95
2015	90

gpcd = Gallons per capita per day

Table 11. Projected Water Demands, 2020 and 2030

	2020		2030	
	Average Day (mgd)	Maximum Day (mgd)	Average Day (mgd)	Maximum Day (mgd)
City of Santa Fe	12.1	20.2	13.5	22.4
Santa Fe County	1.5	3.0	2.6	5.2
Total	13.6	23.2	16.1	27.6

Source: Brown and Caldwell, 2009

6. Source Water Protection Area

The source water protection area (SWPA) is described as a buffer around wells, reservoirs, and on either side of streams and canals for use in identifying potential contamination from sources within close proximity. SWPAs have been delineated for all of the City-owned water sources (Figures 4 through 7):

- City Well Field
- Buckman Well Field
- Santa Fe River watershed, including Nichols and McClure Reservoirs

The methods for delineating SWPAs for groundwater and surface water sources differ, and are described in more detail in the following subsections. The delineated SWPAs meet the criteria of the NMED DWB guidance for establishing an area to evaluate for potential sources of contamination (PSOCs). DBS&A requested and received geographical information system (GIS) data used in NMED DWB's Source Water Protection Atlas (NMED DWB, 2017), an interactive mapping tool that contains active and inactive drinking water sources, regulated sites, and other information. These GIS data were used to generate the maps showing each source's SWPA and PSOCs.

6.1 Groundwater

Per NMED recommendations in the *New Mexico Source Water and Wellhead Protection Toolkit* (NMED DWB, 2013), the SWPA for groundwater sources is defined as the area within a 1-mile radius of each wellhead. In this plan, the delineated SWPAs are subdivided into four zones:

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

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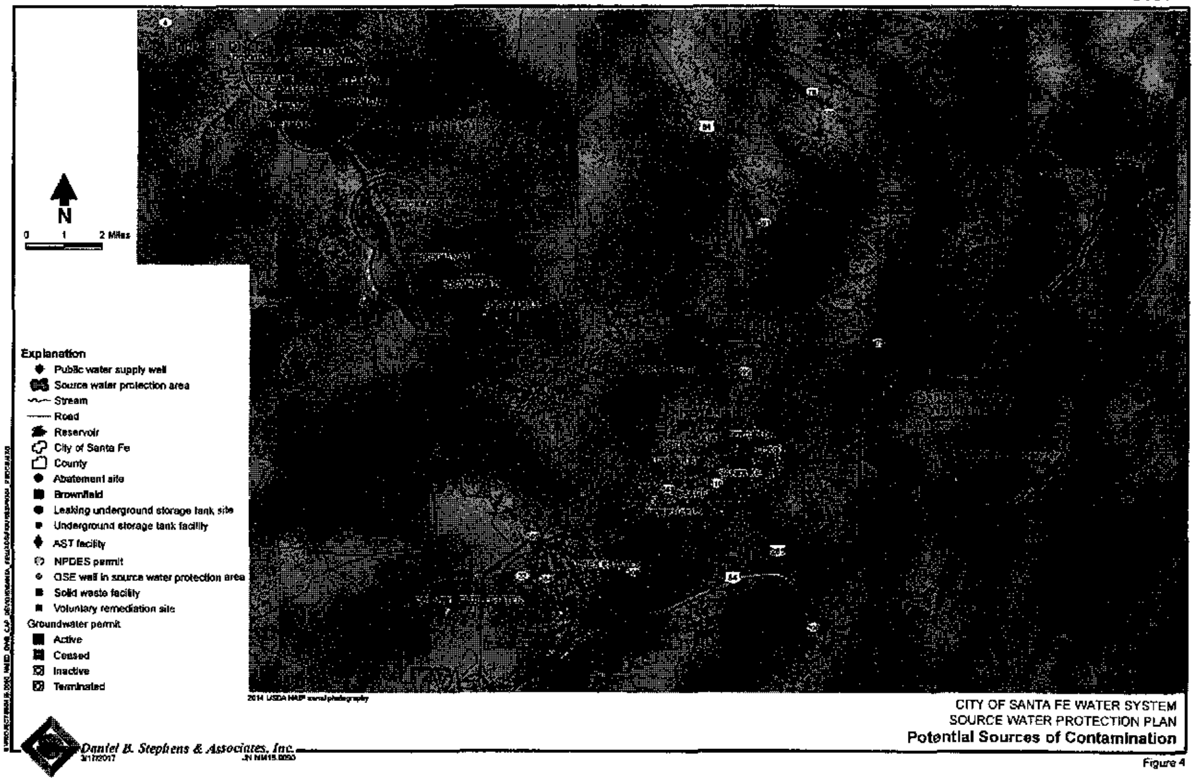

Figure 4

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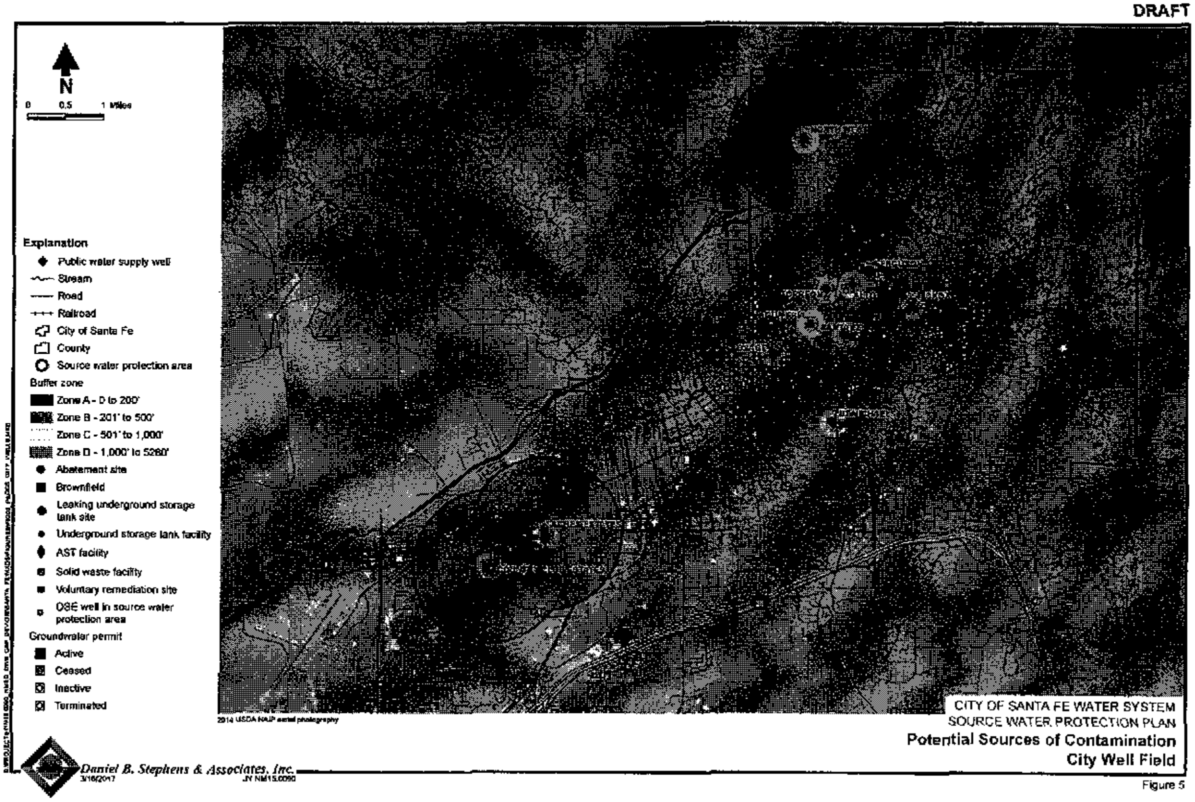

Figure 5

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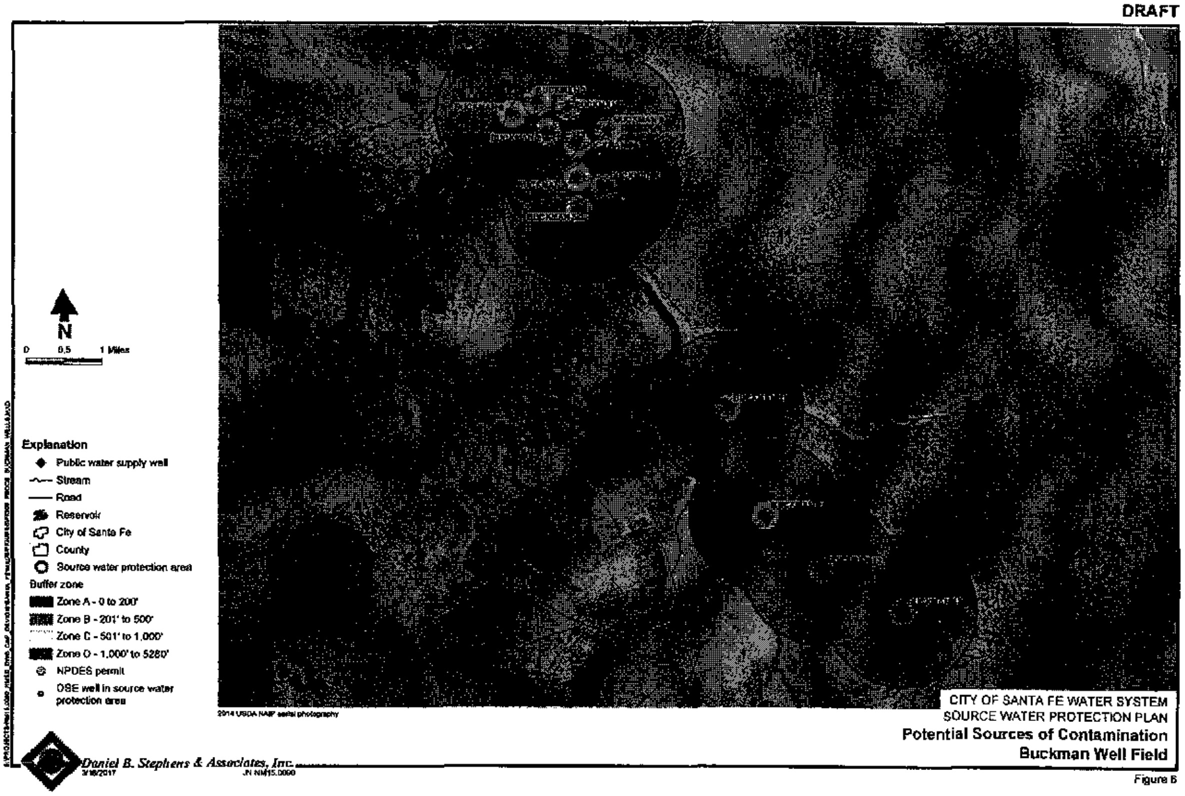

Figure 6

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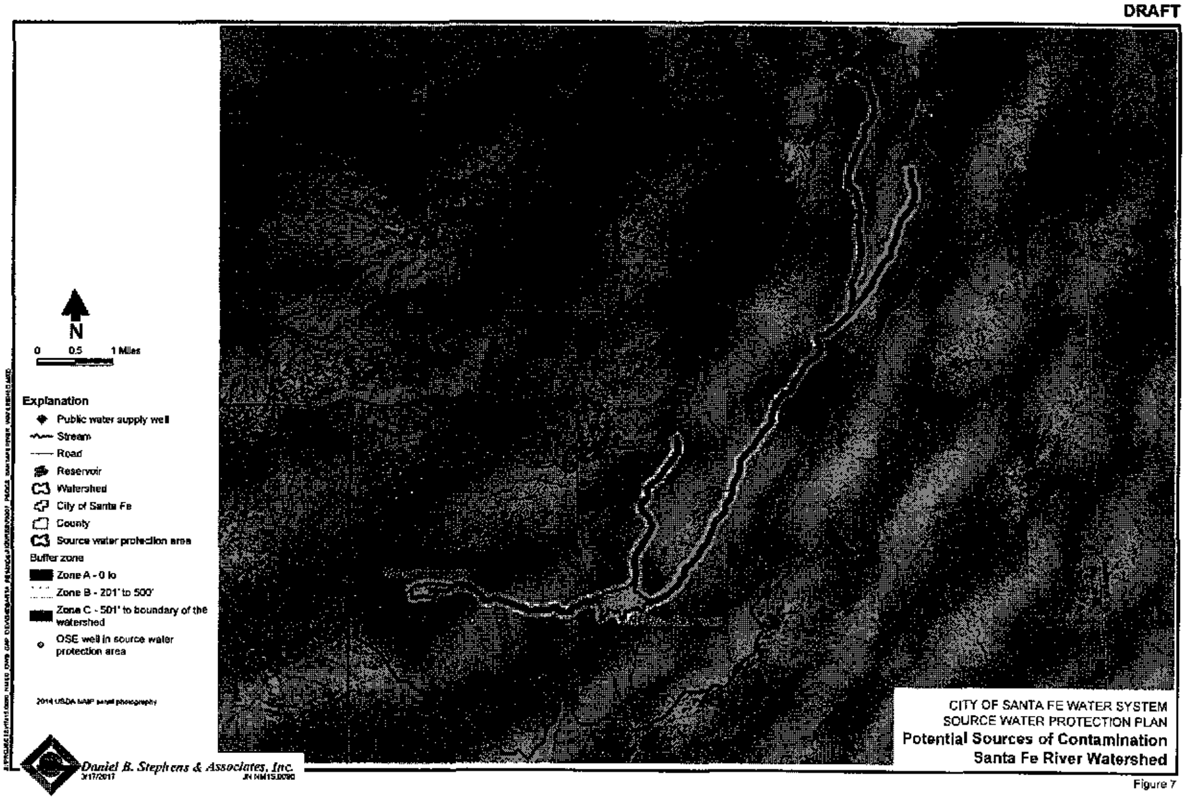

Figure 7

In the 2003 source water assessment for the City, NMED only used three zones: Zones A through C. These zones were determined using the state's designated fixed radius method. Zone D has been added to this plan per the updated NMED recommendations (NMED DWB, 2013), requiring an SWPA with a 1-mile radius. For conservative planning purposes, Zone D is useful in alerting water systems to additional PSOCs.

6.2 Surface Water

In this plan, 17,359 square miles of the Santa Fe River watershed was analyzed. The SWPA for the Santa Fe River is subdivided into three zones:

- Zone A: radius of 0 to 200 feet from each stream bank
- Zone B: radius of 201 to 500 feet from each stream bank
- Zone C: radius of 501 to boundary of the watershed

7. Assessment of Potential Contamination Sources

For purposes of this plan, PSOCs are defined as any possible site or event that could, under any circumstance and time frame, lead to contamination of a water system's sources. Not all sites identified as PSOCs pose the same level of risk. Due to geology and infrastructure construction and present-condition, some PSOCs may pose little to no contamination risk, while others may pose an imminent threat. The susceptibility analysis evaluates the risk PSOCs pose to each source.

Several different resources were used to compile a list of all possible PSOCs within the City's SWPAs. The Source Water Protection Atlas is a database maintained by the NMED DWB (2017) containing information on sites that are registered with the state, such as wastewater discharge permits and fuel storage tanks. Because information included in the Source Water Protection Atlas is not inclusive of all potential sources of contamination, the assessment also included the EPA interactive map (U.S. EPA, 2017), geologic reports, previous reports provided by the City of Santa Fe, and input from the Source Water Protection Team and the public.

PSOCs can be either human-caused or naturally occurring. Both types of PSOC are found within the City's SWPAs, as discussed in the following subsections.

7.1 Human Sources of Contamination

NMED has compiled an extensive list of human-caused PSOCs (Appendix C), with each assigned a unique three-letter map code. In Appendix C, the highlighted categories signify the sources that are not included in the Source Water Protection Atlas. The highlighted PSOCs include commercial uses such as auto salvage, and municipal/residential uses such as drainage features and detention/retention ponds. The human-caused PSOCs known to occur in Santa Fe's SWPAs are listed in Table 12. The most common type of human-caused PSOC is private domestic wells (PDW), with 503 distinct wells occurring throughout the various SWPAs of the City's water sources (21 in the BWF, 466 in the CWF and other City wells, and 16 in the Santa Fe River watershed). In addition to private domestic wells, there are 7 groundwater permits (Table 13) within the SWPAs of the City's water sources, of which only 3 are active.

While unmapped (data needed), septic systems are another human-caused PSOC. Contaminants of concern for this PSOC are septage, pathogens, nitrate, ammonia, chloride, heavy metals, household pesticides, herbicides, cleaning agents and solvents, and fuels. Septic systems are typically installed only 3 to 5 feet below the ground surface. When a septic system's leach field is not operating properly, the effluent will surface, rather than percolate down toward the aquifer. Therefore, septic systems in areas of poorly constructed private domestic wells and/or along arroyos pose the greatest risk.

There has been some actual contamination of City wells, mostly from gas stations. The Santa Fe well is currently being treated with granular activated carbon (GAC). The Alto and Ferguson wells are also contaminated (further discussion to be added for the final draft.).

The voluntary remediation program (VRP) is part of NMED. Entities choose to enroll in the program, agreeing to clean up the contaminated site in exchange for liability protection (NMED Remediation Oversight). Table 14 provides information about the 6 VRP sites within the City's SWPAs. Of the 6 VRP sites, only 1 (Santa Fe County Judicial Complex) is still active.

Table 12. Human-Caused Potential Sources of Contamination

Map Code	Land Use	Description	Contaminants of Concern
Abatement site			
Arroyo	Ephemeral stream	Runoff and infiltration	Pesticides, herbicides, fertilizers, nitrate, pathogens
Brownfield			
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
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
Groundwater permit (active, inactive, ceased, terminated)			
MRP	Primary road, highway, or arterial	Public street, thoroughfare, highway, or main road	Gasoline, diesel fuels, metals, storm water runoff, hazardous materials, radiological materials
MSW	Solid waste transfer stations	Storage, disposal	Metals, organic/inorganic chemicals, pesticides, automotive wastes, oils
NPDES permit	National Pollutant Discharge Elimination System (NPDES) permit		
PDW	Private domestic well	Private domestic well that is registered with the OSE	Conduit for any contaminant to enter aquifer
Voluntary remediation site			See Table 14 for site specific details

Table 13. Groundwater Permits within SWPAs

Permit Status	Permit Holder
Active	Buckman Road Recycling and Transfer Station
Active	Santa Fe Country Club
Active	Santa Fe County Judicial Complex Construction Site
Inactive	Santa Fe Generating Station
Ceased	Sweeny Elementary School
Terminated	Boylan Mobile Home Park
Terminated	Santa Fe Mobile Home Hacienda

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Table 14. Voluntary Remediation Program Sites within City of Santa Fe SWPAs

VRP ID #	Site Name	Site Address	Size (acres)	Contamination Type	Applicant	Application Received	Certificate of Completion	Conditional Certificate of Completion	Status
53072001	Phillips Petroleum	760 Cerrillos Road	0.40	Petroleum hydrocarbons in soil and groundwater; PCE contamination in groundwater.	City of Santa Fe	4/03/2007	12/18/2009	—	Closed
53062001	Premier Nissan	2005 St. Michael's Drive	2.90	Petroleum hydrocarbons associated with hydraulic lifts and sump.	Omega Automotive Real Estate, LLC	4/06/2006	6/02/2006	—	Closed
53012001	Sanbusco Market Center	560 Montezuma Avenue	4.80	Hydraulic oil.	Sanbusco Corp.	6/07/2001	7/23/2001	—	Closed
53092001	Santa Fe County Judicial Complex	327 Sandoval Street	2.35	Petroleum hydrocarbons in soil and groundwater.	Santa Fe County	4/29/2009	—	2/26/2016	Active - CCOC
53032001	Santa Fe Rail Yard Properties	Santa Fe Rail Yard	49.00	Metals and petroleum hydrocarbons in soil.	City of Santa Fe	2/01/2003	2/27/2006	—	Closed
53131002	Smith's #491 Fuel Center	800 St. Michael's Drive	2.10	Petroleum hydrocarbons in soil.	Smith's Food and Drug Stores	9/04/2013	5/15/2015	—	Closed

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There are 8 leaking underground storage tank (LUST) sites located within the SWPA of the CWF:

- Chevron 734
- Giant Stop N Go Alameda
- The Bubble Machine
- 210 and 218 Montezuma Avenue
- Capitol 66
- Conoco Phillips-Burger King FAC. #31044
- Old Trail Garage
- Santa Fe Generating Station

7.2 Natural Sources of Contamination

Arroyos, arsenic, and metamorphic host rock are known natural contaminants in the SWPAs for the City's water sources. Sampling in 2011 revealed that five Buckman wells (wells 1, 9, 11, 12, and 13) have arsenic levels above the MCL. (Further discussion to be added for the final draft.)

While outside of the delineated SWPAs and therefore not assigned a vulnerability ranking, wildfire, a natural PSOC, represents a very real and significant threat to the City's water sources. Wildfires affect the type and quantity of nutrients (especially nitrogen), as well as the turbidity and total suspended solids (TSS) entering surface water sources. Wildfires can also impact the rate of runoff and sedimentation into surface water sources. In 2013, the Water Research Foundation published *Effects of Wildfire on Drinking Water Utilities and Best Practices for Wildfire Risk Reduction and Mitigation* (Sham et al., 2013), which discusses in detail the potential damage wildfires can cause for utilities.

7.3 Susceptibility Ranking

To assess potential contamination risks to a system's water sources, susceptibility rankings have been assigned to each water source. A susceptibility ranking of low, moderately low, moderate, moderately high, or high is assigned based on professional opinion from the available infrastructure, geology, and PSOC information. These rankings are meant to serve only as a

method to identify and prioritize risks to a system's water sources for planning purposes. Susceptibility of a water system to sources of contamination is defined in terms of both a source's vulnerability and sensitivity.

7.3.1 Vulnerability

Vulnerability ranking is based on an inventory of the type, number, and proximity of PSOCs near a water source, and a subjective ranking based on that inventory. Vulnerability rankings of low, moderately low, moderate, moderately high, or high have been assigned. Table 15 lists the PSOC occurrence by zone for each of the City's wells and shows each well's assigned vulnerability ranking. Table 16 provides the same information for the Santa Fe River watershed. Table 17 summarizes the vulnerability rankings for each source.

The first consideration in vulnerability ranking is determining the types of PSOCs present. There is a larger variety of PSOCs present in the SWPAs for the CWF and the City's other wells. Private domestic wells, underground storage tank (UST) and LUST sites, abatement sites, brownfields, and VRP sites are the most notable PSOCs in these locations. Four types of PSOCs are known to occur in the SWPAs of the Buckman wells: arroyos, naturally occurring arsenic, private domestic wells, and the BDD National Pollutant Discharge Elimination System (NPDES) permit. Sampling has revealed that the naturally occurring arsenic concentrations are known to affect water quality in Buckman wells 1, 9, 11, 12, and 13. Therefore, these wells all rank high for vulnerability. Private domestic wells are the only known PSOCs present in the Santa Fe River watershed.

The number of PSOC occurrences is another consideration in determining the vulnerability ranking of a water source. Buckman Well 11 had the least number of PSOCs within its SWPA (10); the Osage well in the CWF had the most (201). Wells within the CWF all had 90 or more PSOC occurrences, while wells in the BWF all had 21 or fewer occurrences. The Santa Fe River watershed is closed to the public, and therefore has little development. The only known PSOCs are 16 private domestic wells. Table 18 shows the overall number of PSOC occurrences by water source.

Table 15. PSOC Occurrences, City of Santa Fe Wells
Page 1 of 9

Well	Buffer Zone	PSOC Type	PSOC Description	Actual or Potential Contamination	Number of Occurrences	Vulnerability Ranking	Explanation of Ranking
City Well Field							
Agua Fria	C	Arroyo	—	P	1	Moderately high	• High PSOC occurrence, *although all in zones C and D* • Over 100 private wells (all in Zone D) • 1 abatement site • 3 LUST sites • Arroyos (5) in SWPA
	D	Abatement site	Santa Fe Well, PNM	P	1		
		Arroyo	—	P	4		
		CRY	Railroad	P	1		
		CSS/CFB	Leaking underground storage tank (LUST) site	A	3		
		CSS/CFB	Underground storage tank facility	P	5		
		Groundwater permit (inactive)	Santa Fe Generating Station	P	1		
		MRP	Primary road, highway, or arterial	P	2		
		PDW	Private domestic well	P	132		
Alto	C	PDW	Private domestic well	P	4	Moderately high	• High PSOC occurrence • Over 50 private wells • 4 abatement sites • 5 LUST sites • 1 VRP site • Arroyos (7) in SWPA
	D	Abatement site	Santa Fe Well PNM; One Hour Martinizing, Santa Fe; Santa Fe Railyard/ConocoPhillips/La Unica Dry Cleaners; Ortiz Landfill Santa Fe	P	4		
		Arroyo	—	P	7		
		CRY	Brownfield - Santa Fe Railyard	P	1		
		CRY	Railroad	P	1		
		CSS/CFB	LUST site	A	5		
		CSS/CFB	Underground storage tank facility	P	7		
		Groundwater permit (inactive)	Santa Fe Generating Station	P	1		
		MRP	Primary road, highway, or arterial	P	2		

Table 15. PSOC Occurrences, City of Santa Fe Wells
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Well	Buffer Zone	PSOC Type	PSOC Description	Actual or Potential Contamination	Number of Occurrences	Vulnerability Ranking	Explanation of Ranking
Alto (cont.)	D	MSW	Solid Waste Facilities - Santa Fe Transfer	P	1	Moderately high	• High PSOC occurrence • Over 50 private wells • 4 abatement sites • 5 LUST sites • 1 VRP site • Arroyos (7) in SWPA
		PDW	Private domestic well	P	58		
		Voluntary remediation site	Sanbusco Market Center	A	1		
Ferguson	C	Arroyo	—	P	1	Moderately high	• High PSOC occurrence • Over 50 private wells • 4 abatement sites • 5 LUST sites • 1 VRP site • 3 brownfield sites • Arroyos (9) in SWPA
		CSS	LUST site	A	2		
		PDW	Private domestic well	P	4		
	D	Abatement site	Santa Fe Well, PNM; One Hour Martinizing, Santa Fe; Santa Fe Railyard/ConocoPhillips/La Unica Dry Cleaners; Ortiz Landfill Santa Fe	P	4		
		Arroyo	—	P	8		
		Brownfield	Santa Fe Railyard; Santa Fe County Judicial Complex; Santa Fe River Assessment	P	3		
		CRY	Railroad	P	1		
		CSS/CFB	LUST site	A	5		
		Groundwater permit (active)	Santa Fe County Judicial Complex Construction Site	P	1		
		Groundwater permit (inactive)	Santa Fe Generating Station	P	1		
		MRP	Primary road, highway, or arterial	P	2		
		PDW	Private domestic well	P	54		
		Voluntary remediation site	Sanbusco Market Center; Santa Fe County Judicial Complex; Phillips Petroleum; Santa Fe Rail Yard	A	4		

Table 15. PSOC Occurrences, City of Santa Fe Wells
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Well	Buffer Zone	PSOC Type	PSOC Description	Actual or Potential Contamination	Number of Occurrences	Vulnerability Ranking	Explanation of Ranking
Osage	A	Arroyo	—	P	1	Moderately high	• High PSOC occurrence • 1 PSOC in Zone A • Arroyos (7) in SWPA • Over 175 private wells, some of which occur in zones B and C
	B	PDW	Private domestic well	P	3		
	C	PDW	Private domestic well	P	9		
	D	Arroyo	—	P	6		
		CSS/CFB	Underground storage tank facility	P	6		
		Groundwater permit (terminated)	Boylan Mobile Home Park	P	1		
		MRP	Primary road, highway, or arterial	P	1		
		PDW	Private domestic well	P	174		
Santa Fe	A	Arroyo	—	P	1	High	• High PSOC occurrence • 1 PSOC in Zone A • Over 90 private wells • 1 abatement site (Zone B) • 4 LUST sites • 2 VRP sites • Arroyos (8) in SWPA
	B	Abatement site	Santa Fe Well, PNM	P	1		
	C	Groundwater permit (inactive)	Santa Fe Generating Station	P	1		
	D	Arroyo	—	P	7		
		CRY	Brownfield - Santa Fe Railyard	P	1		
		CRY	Railroad	P	1		
		CSS/CFB	LUST site	A	4		
		CSS/CFB	Underground storage tank facility	P	8		
		MRP	Primary road, highway, or arterial	P	2		
		PDW	Private domestic well	P	93		
		Voluntary remediation site	Phillips Petroleum; Santa Fe Rail Yard Properties	A	2		

Table 15. PSOC Occurrences, City of Santa Fe Wells
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Well	Buffer Zone	PSOC Type	PSOC Description	Actual or Potential Contamination	Number of Occurrences	Vulnerability Ranking	Explanation of Ranking
St. Michaels	A	CRY	Railroad	P	1	High	• High PSOC occurrence • 1 PSOC in Zone A, 2 in Zone B • 2 VRP sites in Zone B • Arroyos (7) in SWPA • Over 60 private wells
	B	Arroyo	—	P	1		
		Voluntary remediation site	Premier Nissan	A	1		
	C	CSS	Underground storage tank facility	P	1		
		CSS	Voluntary remediation site - Smith's #491 Fuel Center	A	1		
	D	Arroyo	—	P	6		
		CSS/CFB	Underground storage tank facility	P	9		
		MRP	Primary road, highway, or arterial	P	2		
		PDW	Private domestic well	P	69		
Torreon	C	PDW	Private domestic well	P	6	Moderately high	• High PSOC occurrence, although all in zones C and D • Over 80 private wells • 4 LUST sites • 2 abatement sites • Arroyos (5) in SWPA
	D	Abatement site	Santa Fe Well, PNM; Ortiz Landfill Santa Fe	P	1		
		Arroyo	—	P	5		
		CRY	Railroad	P	1		
		CSS/CFB	LUST site	A	4		
		CSS/CFB	Underground storage tank facility	P	5		
		Groundwater permit (active)	Buckman Road Recycling and Transfer Station	P	1		
		Groundwater permit (inactive)	Santa Fe Generating Station	P	1		
		MRP	Primary road, highway, or arterial	P	2		
		MSW	Solid Waste Facility - Santa Fe Transfer	P	1		
		PDW	Private domestic well	P	76		

Table 15. PSOC Occurrences, City of Santa Fe Wells
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Well	Buffer Zone	PSOC Type	PSOC Description	Actual or Potential Contamination	Number of Occurrences	Vulnerability Ranking	Explanation of Ranking
Other City Wells							
Acres Estates	C	CSS	Underground storage tank facility	P	1	Moderately low	• Moderate PSOC occurrence, all in zones C and D • Over 50 private wells • Arroyos (4) in SWPA
		PDW	Private domestic well	P	3		
	D	CFA	Aboveground storage tank facility - NMDOT	P	3		
		Arroyo	—	P	4		
		Groundwater permit (ceased)	Sweeny Elementary School	P	1		
		PDW	Private domestic well	P	50		
		MRP	Primary road, highway, or arterial	P	1		
		CSS/CFB	Underground storage tank facility	P	6		
Country Club Estates	A	PDW	Private domestic well	P	1	Moderately low	• Moderate PSOC occurrence • 1 PSOC in Zone A • Over 30 private wells • Arroyos (4) in SWPA
	C	PDW	Private domestic well	P	2		
	D	Arroyo	—	P	3		
		Groundwater permit (active)	Santa Fe Country Club	P	1		
		Groundwater permit (ceased)	Sweeny Elementary School	P	1		
		Groundwater permit (terminated)	Santa Fe Mobile Home Hacienda	P	1		
		PDW	Private domestic well	P	36		
		CSS	Underground storage tank facility	P	1		

Table 15. PSOC Occurrences, City of Santa Fe Wells
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Well	Buffer Zone	PSOC Type	PSOC Description	Actual or Potential Contamination	Number of Occurrences	Vulnerability Ranking	Explanation of Ranking
Hickox	B	CSS	Underground storage tank facility	P	1	Moderately high	• High PSOC occurrence • 1 PSOC in Zone B • Over 130 private wells • 8 LUST sites • 3 abatement sites • 2 brownfield sites • Arroyos (4) in SWPA
	C	CRY	Brownfield - Santa Fe Railyard	P	1		
		PDW	Private domestic well	P	1		
		CRY	Railroad	P	1		
	D	Abatement site	Santa Fe Well, PNM; One Hour Martinizing, Santa Fe; Santa Fe Railyard/ConocoPhillips/La Unica Dry Cleaners	P	3		
		Arroyo	—	P	5		
		Brownfield	Santa Fe County Judicial Complex; Santa Fe River Assessment	P	2		
		Groundwater permit (active)	Santa Fe County Judicial Complex Construction Site	P	1		
		Groundwater permit (inactive)	Santa Fe Generating Station	P	1		
		CSS/CFB	LUST site	A	8		
		PDW	Private domestic well	P	131		
		MRP	Primary road, highway, or arterial	P	3		
		CSS/CFB	Underground storage tank facility	P	7		
		Voluntary remediation site	Sanbusco Market Center; Santa Fe County Judicial Complex; Phillips Petroleum; Santa Fe Rail Yard Properties	A	4		
North West	D	Arroyo	—	P	6	Low	• Low PSOC occurrence, all in Zone D • Arroyos (6) in SWPA
		PDW	Private domestic well	P	11		
		MRP	Primary road, highway, or arterial	P	1		
		CFB	Underground storage tank facility	P	1		

Table 15. PSOC Occurrences, City of Santa Fe Wells
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Well	Buffer Zone	PSOC Type	PSOC Description	Actual or Potential Contamination	Number of Occurrences	Vulnerability Ranking	Explanation of Ranking
Buckman Well Field							
Buckman 1	A-D	Arsenic	Naturally occurring contaminant	A	1	High	• Despite the low PSOC occurrence, there is known arsenic contamination • Arroyos (10) in SWPA
	B	Arroyo	—	P	1		
		PDW	Private domestic well	P	1		
	C	Arroyo	—	P	1		
		NPDES permit	Buckman Direct Diversion Project	P	1		
	D	Arroyo	—	P	8		
		PDW	Private domestic well	P	7		
Buckman 2	B	Arroyo	—	P	1	Low	• Low PSOC occurrence • Arroyos (11) in SWPA
	C	Arroyo	—	P	1		
		NPDES permit	Buckman Direct Diversion Project	P	1		
	D	Arroyo	—	P	9		
		PDW	Private domestic well	P	9		
Buckman 3	B	Arroyo	—	P	1	Low	• Low PSOC occurrence • Arroyos (9) in SWPA
	C	PDW	Private domestic well	P	1		
	D	Arroyo	—	P	8		
		NPDES permit	Buckman Direct Diversion Project	P	1		
		PDW	Private domestic well	P	9		
Buckman 4	C	Arroyo	—	P	1	Low	• Low PSOC occurrence • Arroyos (11) are main PSOC type in the SWPA
	D	Arroyo	—	P	10		
		PDW	Private domestic well	P	2		
Buckman 5	C	Arroyo	—	P	1	Low	• Low PSOC occurrence • Arroyos (9) are main PSOC type in the SWPA
	D	Arroyo	—	P	8		
		PDW	Private domestic well	P	2		

Table 15. PSOC Occurrences, City of Santa Fe Wells
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Well	Buffer Zone	PSOC Type	PSOC Description	Actual or Potential Contamination	Number of Occurrences	Vulnerability Ranking	Explanation of Ranking
Buckman 6	A	Arroyo	—	P	1	Low	• Low PSOC occurrence • 1 PSOC in Zone A • Arroyos (8) are main PSOC type in the SWPA
	B	Arroyo	—	P	1		
	D	Arroyo	—	P	7		
		PDW	Private domestic well	P	2		
Buckman 7	B	Arroyo	—	P	1	Low	• Low PSOC occurrence • Arroyos (7) in SWPA
	C	Arroyo	—	P	1		
	D	Arroyo	—	P	5		
		NPDES permit	Buckman Direct Diversion Project	P	1		
		PDW	Private domestic well	P	9		
Buckman 8	B	Arroyo	—	P	1	Low	• Low PSOC occurrence • Arroyos (10) in SWPA
	C	Arroyo	—	P	1		
	D	Arroyo	—	P	8		
		NPDES permit	Buckman Direct Diversion Project	P	1		
		PDW	Private domestic well	P	9		
Buckman 9	A-D	Arsenic	Naturally occurring contaminant	A	1	High	• Despite the low PSOC occurrence, there is known arsenic contamination • 1 PSOC in Zone A • Arroyos (9) in SWPA
	A	Arroyo	—	P	1		
	C	Arroyo	—	P	1		
	D	Arroyo	—	P	7		
		PDW	Private domestic well	P	6		
Buckman 10	B	Arroyo	—	P	1	Low	• Low PSOC occurrence • Arroyos (11) only PSOC type in the SWPA
	C	Arroyo	—	P	1		
	D	Arroyo	—	P	9		

Table 15. PSOC Occurrences, City of Santa Fe Wells
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Well	Buffer Zone	PSOC Type	PSOC Description	Actual or Potential Contamination	Number of Occurrences	Vulnerability Ranking	Explanation of Ranking
Buckman 11	A-D	Arsenic	Naturally occurring contaminant	A	1	High	• Despite the low PSOC occurrence, there is known arsenic contamination • 1 PSOC in Zone A • Arroyos (9) are main PSOC type in the SWPA
	A	Arroyo	—	P	1		
	C	Arroyo	—	P	1		
	D	Arroyo	—	P	7		
		PDW	Private domestic well	P	1		
Buckman 12	A-D	Arsenic	Naturally occurring contaminant	A	1	High	• Despite the low PSOC occurrence, there is known arsenic contamination • Arroyos (12) are main PSOC type in the SWPA
	A	Arroyo	—	P	1		
	B	Arroyo	—	P	1		
	C	Arroyo	—	P	10		
	D	PDW	Private domestic well	P	2		
Buckman 13	A-D	Arsenic	Naturally occurring contaminant	A	1	High	• Despite the low PSOC occurrence, there is known arsenic contamination • 1 PSOC in Zone A • Arroyos (10) in SWPA
	A	Arroyo	—	P	1		
	D	Arroyo	—	P	10		
		PDW	Private domestic well	P	9		

Table 16. PSOC Occurrences, Santa Fe River Watershed

Well	Buffer Zone	PSOC Type	PSOC Description	Actual or Potential Contamination	Vulnerability Ranking	Explanation of Ranking
Santa Fe River	C	PDW	Private domestic well	P	Low	• Low PSOC occurrence • Low diversity of PSOCs
	D	PDW	Private domestic well	P		

Table 17. Vulnerability Rankings

Source	Vulnerability Ranking
City Well Field	
Agua Fria	Moderately high
Alto	Moderately high
Ferguson	Moderately high
Osage	Moderately high
Santa Fe	High
St. Michaels	High
Torreon	Moderately high
Other City Wells	
Acres Estates	Moderately low
Country Club Estates	Moderately low
Hickox	Moderately high
North West	Low
Buckman Well Field	
Buckman 1	High
Buckman 2	Low
Buckman 3	Low
Buckman 4	Low
Buckman 5	Low
Buckman 6	Low
Buckman 7	Low
Buckman 8	Low
Buckman 9	High
Buckman 10	Low
Buckman 11	High
Buckman 12	High
Buckman 13	High
Santa Fe River Watershed	
Santa Fe River Watershed	Low

Table 18. PSOC Occurrence by Source

Source	Total PSOCs
City Well Field	
Agua Fria	150
Alto	92
Ferguson	90
Osage	201
Santa Fe	121
St. Michaels	91
Torreon	103
Other City Wells	
Acres Estates	69
Country Club Estates	46
Hickox	169
North West	19
Buckman Well Field	
Buckman 1	20
Buckman 2	21
Buckman 3	20
Buckman 4	13
Buckman 5	11
Buckman 6	11
Buckman 7	17
Buckman 8	20
Buckman 9	16
Buckman 10	11
Buckman 11	11
Buckman 12	15
Buckman 13	21
Santa Fe River Watershed	
Santa Fe River Watershed	16

The third consideration in vulnerability ranking is proximity to a wellhead. The Osage, Santa Fe, St. Michaels, and Country Club Estates wells, as well as Buckman wells 6, 9, 11, 12, and 13, have PSOC occurrences in Zone A, defined as 0 to 200 feet from the water source. The Osage, Santa Fe, St. Michaels, and Hickox wells, as well as Buckman wells 1, 2, 3, 6, 7, 8, 10 and 12, have PSOC occurrences in Zone B, identified as 200 to 500 feet from the water source.

7.3.2 Sensitivity (section to be updated/completed for the final draft)

Sensitivity is an assessment of infrastructure construction and the hydrogeologic characteristics associated with the water source. Water sources are ranked low, moderately low, moderate, moderately high, or high for sensitivity. Detailed infrastructure construction and integrity data are provided in Appendix D. Table 19 provides a high-level summary of this information by noting the presence/absence of known infrastructure construction and/or hydrology concerns by water source, and lists the associated sensitivity ranking.

All of the City's wells are deep, which generally makes them less susceptible to surface contamination events. All City wells have been designed and built so as to protect against contamination, but the Agua Fria, Osage, Alto, and Santa Fe wells do not meet the same level of construction standards as the other wells in the City's system (warranting the moderately low ranking).

By nature, surface water sources are more sensitive to surface contamination events (thus the 'Yes' response in Table 19 under hydrogeologic concerns) than groundwater sources because there are no natural barriers in place if such an event were to occur. Therefore, despite sound infrastructure, the Santa Fe River watershed ranked moderate for sensitivity.

Update on issues addressed in 2014 Sanitation Survey.

7.3.3 Susceptibility

A water source's susceptibility is determined by the combination of its sensitivity and vulnerability rankings. Table 20 summarizes the susceptibility rankings for each source.

Table 19. Sensitivity Rankings (updates needed)

Source	Infrastructure Construction Issues	Hydrogeologic Concerns	Sensitivity Ranking
City Well Field			
Agua Fria	No	No	Moderately low
Alto	No	No	Moderately low
Ferguson	No	No	Low
Osage	No	No	Moderately low
Santa Fe	No	No	Moderately low
St. Michaels	No	No	Low
Torreon	No	No	Low
Other City Wells			
Acres Estates			
Country Club Estates			
Hickox			
North West	No	No	Low
Buckman Well Field			
1	No	No	Low
2	No	No	Low
3	No	No	Low
4	No	No	Low
5	No	No	Low
6	No	No	Low
7	No	No	Low
8	No	No	Low
9	No	No	Low
10	No	No	Low
11	No	No	Low
12	No	No	Low
13	No	No	Low
Santa Fe River			
Santa Fe River	No	Yes	Moderate

Table 20. Susceptibility Rankings

Source	Susceptibility Ranking
City Well Field	
Agua Fria	Moderate
Alto	Moderately low
Ferguson	Moderately low
Osage	Moderate
Santa Fe	Moderate
St. Michaels	Moderately Low
Torreon	Moderately low
Other City Wells	
Acres Estates	
Country Club Estates	
Hickox	
North West	Low
Buckman Well Field	
1	High
2	Low
3	Low
4	Low
5	Low
6	Low
7	Low
8	Low
9	High
10	Low
11	High
12	High
13	High
Santa Fe River	
Santa Fe River	Moderate

8. Source Water Monitoring Plan

Appendix E provides the sampling schedule as shown on the NMED Drinking Water Watch (NMED DWW, 2017).

9. PSOC Monitoring and Control Plan

The City monitors water quality in accordance with state and federal requirements. In addition, the City monitors for arsenic levels at the BWF (more information needed on arsenic monitoring plan) and is partnered with NMED and LANL to monitor for possible LANL contamination (more information needed). Any additional monitoring of the sources warranted?

10. Conclusions and Recommended Action Items

The purpose of NMED's Source Water Protection Program is to protect drinking water sources before they become contaminated. Communities choose to voluntarily participate in the program, the culmination of which is the development of a SWPP. The plan inventories and assesses PSOCs within each source's SWPA.

PSOCs are defined as any possible site or event that could, under any circumstance and time frame, lead to contamination of a water system's sources. Not all sites identified as PSOCs pose the same level of risk. Therefore, each source was assigned a susceptibility ranking of low, moderately low, moderate, moderately high, or high. The rankings serve only as a method to identify and prioritize risks to a system's water sources for planning purposes. Table 21 summarizes the vulnerability, sensitivity, and overall susceptibility rankings of the City's water sources.

Surface water sources are typically more susceptible to PSOCs than groundwater sources. However, the City of Santa Fe has closed public access to the Santa Fe River watershed, greatly reducing the number and types of PSOCs found within the river's SWPA. Of the City's wells, those in the CWF have the highest PSOC diversity and occurrence because they are located in an urbanized area.

Table 21. Vulnerability, Sensitivity, and Susceptibility Rankings of the City of Santa Fe Water Sources

Source	Vulnerability Ranking	Sensitivity Ranking	Susceptibility Ranking
City Well Field			
Agua Fria	Moderately high	Moderately low	Moderate
Alto	Moderately high	Moderately low	Moderately low
Ferguson	Moderately high	Low	Moderately low
Osage	Moderately high	Moderately low	Moderate
Santa Fe	High	Moderately Low	Moderate
St. Michaels	High	Low	Moderately Low
Torreon	Moderately high	Low	Moderately low
Other City Wells			
Acres Estates	Moderately low		
Country Club Estates	Moderately low		
Hickox	Moderately high		
North West	Low	Low	Low
Buckman Well Field			
1	High	Low	High
2	Low	Low	Low
3	Low	Low	Low
4	Low	Low	Low
5	Low	Low	Low
6	Low	Low	Low
7	Low	Low	Low
8	Low	Low	Low
9	High	Low	High
10	Low	Low	Low
11	High	Low	High
12	High	Low	High
13	High	Low	High
Santa Fe River			
Santa Fe River	Low	Moderate	Moderate

Outside of the mapped SWPA, wildfires represent a significant naturally occurring potential threat to the City's surface water supply (Section 7.2).

Further discussion and conclusions to be added for the final draft.

Based on NMED guidelines and the conclusions from this evaluation, DBS&A makes the following recommendations for Santa Fe's implementation of the Source Water Protection Program:

- The Source Water Protection Team should meet annually to review the State's Source Water Protection Atlas, PSOCs within the delineated SWPAs, and any changes to the system's sources.
- This SWPP 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 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.
- A public information program should be developed related to source water protection. This program would educate the public about the City's water sources, potential threats to those sources, and measures that the public can take to protect 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 example flyer has been prepared and is provided as Appendix F.

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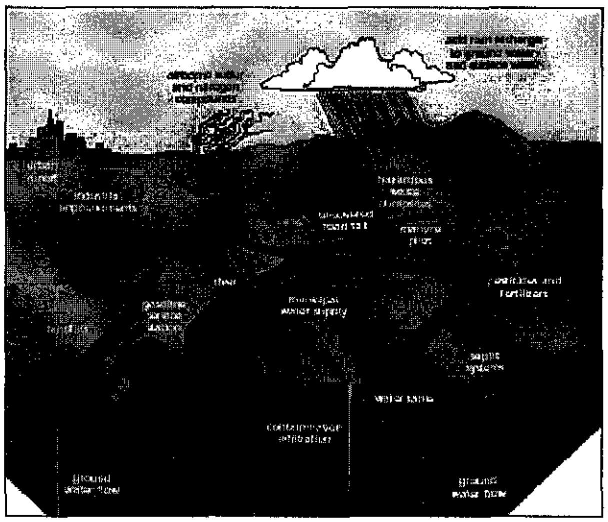
Appendix A

NMED Source Water Assessment

Source Water Assessment & Protection Program
Report of City of Santa Fe Water Utility

Public Water System # 05126

Potential Threats to Drinking Water Sources



New Mexico Environment Department -
Drinking Water Bureau
October 2003
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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 CITY OF SANTA FE 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 SWAPP*)
3. Inventory of Actual and Potential Sources of Contamination (*completed by NMED-DWB under SWAPP*)
4. Completion of a Susceptibility Analysis (*completed by NMED-DWB under SWAPP*)
5. Management of Source Water Protection Areas
6. Planning for Existing and Future Events / Contingency Protocol

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[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 groundwater 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 is 200 to 500 feet from the wellhead, and Zone C is the area between 500 to 1,000 feet from the wellhead. Surface water[6] source delineation was determined according to buffer zones as they applied to two classifications of watersheds.

Type A Watersheds were defined as having an area under thirty square miles, and the entire watershed was delineated according to topographic or U.S. Geological Survey 8-Digit Cataloging Units. Buffer zones within the watershed were defined as follows: Buffer Zone A is a 200 foot-wide strip of land paralleling either bank of an active stream channel and/or extending from the mouth or inlet of an impoundment to the uppermost boundary of the watershed; Buffer Zone B is a 300 foot-wide strip of land beginning at the outside margin of buffer Zone A; and Buffer Zone C is the balance of the land area extending to the topographic boundary.

Type B watersheds were defined as having an area over thirty square miles, and the entire watershed was delineated according topographic or U.S. Geological Survey 8-Digit Cataloging Units; however, PSOC inventories and susceptibility analysis criteria were applied only to that portion of the watershed defined as a Critical Stream Segments were defined as the reach of the watercourse beginning 500 feet below a public water system intake and extending for a distance of ten miles upstream. Zones A, B, and C were defined within the Critical Stream Segments as follows: Zone A is a 200 foot-wide strip of land paralleling either bank of an active stream channel; Buffer Zone B is a 300 foot-wide strip of land paralleling an active stream channel and beginning at the outside margin of Buffer Zone A, and Buffer Zone C is a ½ mile-wide corridor of land paralleling either bank of an active stream channel, but excluding buffer zones A and B. You may decide to customize or use another delineation method to produce the maps or use these to satisfy the requirements for this Step. Geographical Information Systems ArcView 8.0 was used to generate the maps.

The PSOC were assembled through database[7] tables and shapefiles, sanitary surveys, and water system and DWB staff review within the context of the limitations of resources, and other available information. As shown in the example of the groundwater delineation, Appendix A, PSOC identified from the databases, such as UST facilities are shown as points, while

[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] Where it was determined that ground water sources were under the direct influence of surface water (GWUDI), the interface zone was delineated as the watershed boundary. In areas where aquifer units outcrop near an active stream channel and where geological interpretation allowed more accurate definition of interface zones, the length of the critical stream segment may have been reduced.

[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), 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.

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 if located within a delineated area as required under the SWAPP process. For Type A watersheds PSOC located within the watershed were inventoried. For Type B watersheds only those PSOC located within a critical stream segment were inventoried. 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[8] 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.

Table 1 (Example)

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

[8] 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.

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 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.

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[9] 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.

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 (Example)

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 [10] Index (refer to Appendix B for matrices). The sensitivity of surface

[9] 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 a water source. 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).***

[10] *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);

water systems to PSOC was similarly determined, and was assessed according to an evaluation of 1) stream flow rate or area of a reservoir, 2) the adequacy of construction and physical integrity of intake structures, and 3) calculation of the WRASTIC Index[11] for the system or intake.

Table 3 (Example)

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.

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.

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.

[11] *WRASTIC* is a method developed by the NMED-DWB to evaluate the potential for surface water contamination and is an acronym for wastewater discharges (W); recreational land use impacts (R); agricultural land use impacts (A), size of watershed (S); transportation avenues (T); industrial land use impacts (I); and amount of vegetative ground cover (C). The method assigns a relative weight to each of these factors to determine the relative sensitivity of a given surface water supply to surface-derived contamination. The higher the WRASTIC Index, the more sensitive the water supply is to contamination.

DRASTIC Index Parameters (see footnote 10)	
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.
WRASTIC Index Parameters (see footnote 11)	
Wastewater	The presence and type of wastewater generation in the delineated source area.
Recreational Activities	Consideration of recreational use in the delineated source area.
Agricultural Land Use Impacts	The number of agricultural land uses in the delineated source area.
Size of the Watershed	The evaluation of watershed.
Transportation Avenues	An evaluation of types of transportation within the area of the watershed.
Industrial Land Use Impacts	The amount of industrial discharge within the watershed area.
Vegetative Ground Cover	The amount or percentage of vegetative ground cover.
Surface Water Intake	A constructed devise where water is directed into a water system.
Turbidity	Used as a measurement of suspended solids and colloidal or soluble organic matter that does not settle out of water.
Watershed	For purposes of the SWAPP assessment, a watershed is defined as 1) the topographic boundary from which water in this area of land drains downslope to the lowest point, and 2) a boundary defined according to the USGS 8-Digit Cataloging Units of New Mexico.
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. The area of land defined as a *watershed* as noted above.

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)	

Table 5	
COMPOSITE SENSITIVITY RANKING	
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

		Sensitivity Ranking				
SUSCEPTIBILITY RANKING		High	Moderately High	Moderate	Moderately Low	Low
Vulnerability Ranking	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 system 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* (See below).

Table 8 — SOURCE SUSCEPTIBILITY RANKING FOR THE *CITY OF SANTA FE WATER SUPPLY SYSTEM*

SOURCE NAME	Sensitivity Rank	Vulnerability Rank	Susceptibility Rank	Operational Exceptions	Final Rank
Agua Fria Well	Moderately low	Low	Low	-	Low
Alto Well	Moderately low	High	Moderately High	3 PSOC	High
Ferguson Well	Moderately low	High	Moderately High	3 PSOC	High
Northwest Well	Low	Low	Low	-	Low
Osage Well	Moderately low	High	Moderately High	-	Moderately High
Santa Fe Well	Moderately low	High	Moderately High	3 PSOC	High
St. Michaels Well	Moderately low	High	Moderately High	3 PSOC	High
Torreon Well	Moderately low	High	Moderately High	-	Moderately High
Buckman # 1	Moderately low	High	Moderately High	-	Moderately High
Buckman # 2	Moderately low	Low	Moderately Low	-	Moderately Low
Buckman # 3	Moderately low	High	Moderately High	-	Moderately High
Buckman #3A	Low	Low	Low	-	Low
Buckman # 4	Moderately low	Low	Moderately Low	-	Moderately Low
Buckman # 5	Moderately low	Low	Moderately Low	-	Moderately Low
Buckman # 6	Moderately low	Low	Moderately Low	-	Moderately Low
Buckman # 7	Low	Low	Low	-	Low
Buckman # 8	Moderately low	Low	Moderately Low	-	Moderately Low
McClure Reservoir	Moderate	Low	Moderately Low	-	Moderately Low
Nichols Reservoir	Moderate	Low	Moderately Low	-	Moderately Low

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[12] 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.[13] 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 City of Santa Fe 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 an evaluation of the

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

[13] 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.

available information. The susceptibility rank of the entire water system is **Moderately Low.**

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 1) to help illustrate some of the SWAPP steps.

REPORTING:
The report was provided to the City of Santa Fe 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.*

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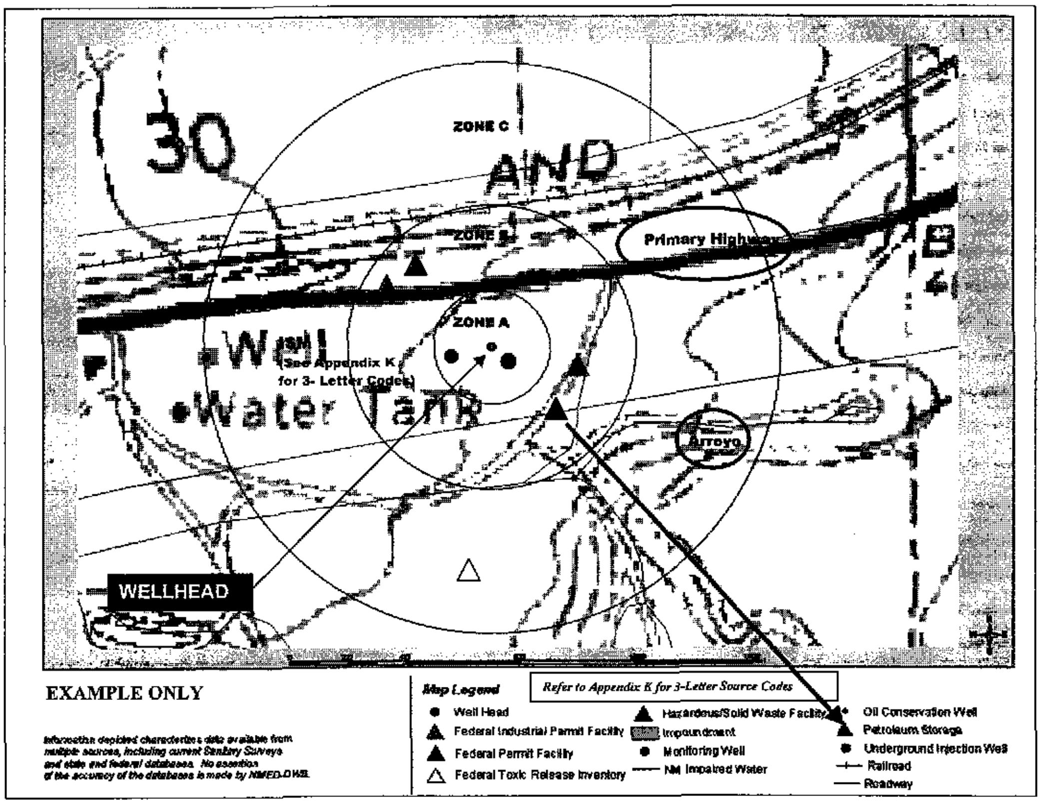
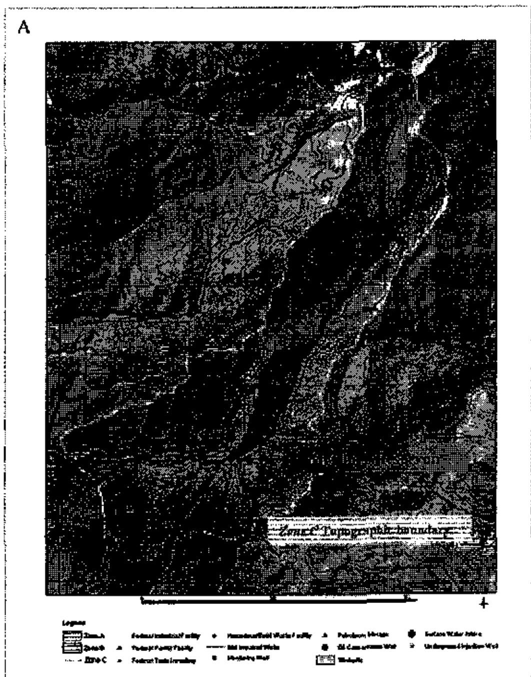
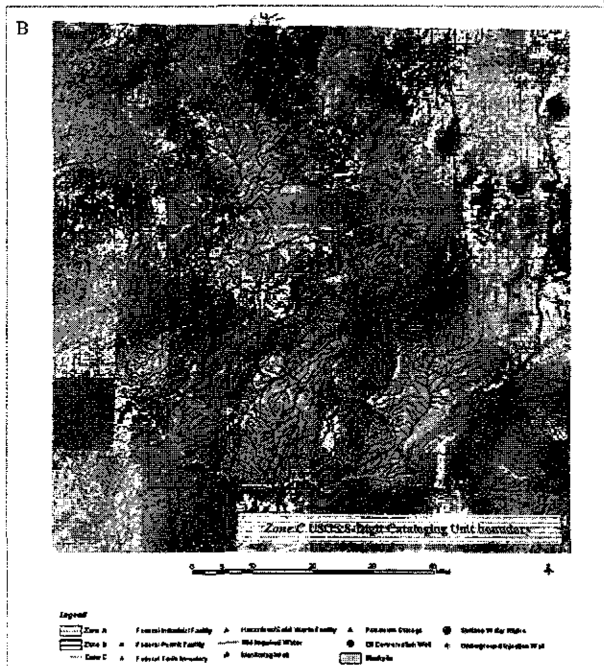






Example A: *Type A* Watershed. The delineation includes the entire topographic boundary, shown highlighted in yellow. The boundary is designated as Zone C. All PSOC lying within Zones A, B, and C are inventoried according to SWAPP.

Example B: *Type B* Watershed. A *Type B* watershed has an area greater than 55 square miles (see State of New Mexico, Source Water Assessment and Protection Program, February 2000). The delineated area extends 10-miles from the uppermost reservoir intake. Buffer Zone C, termed the *Critical Stream Segment* and shown as a green border, encompasses a ½ mile-wide corridor extending up to 10 miles from the uppermost intake. All PSOC lying within the 10-mile radius in Zones A, B, and those within the critical stream segments, Zone C, are inventoried according to SWAPP.

PART 1 (A) SOURCE DATA: *GROUND WATER SYSTEM*

PARAMETER						
Source Name or Identifier	Agua Fria Well	Alto Well	Ferguson Well	Northwest Well	Osage Well	Santa Fe Well
Date Drilled	1951	1968	1970	1998	1971	1951
Drilling Method	Not Available	mud rotary	Not Available	reverse rotary	Not Available	Not Available
Total Depth (ft)	740	741	826	2000	809	1,523
Static Water Level (ft)	238	156	137	408	89 ft	213
Date of Water Level Measure	*1994*	*Not Available*	*Not Available*	*1998*	Not Available	Not Available
Casing Material	steel	steel	Not Available	steel	Not Available	Not Available
Casing Length (ft)	740	725	750	500	770	725
Casing Height Above Ground Surface (in)	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
Casing Diameter (in) (O.D.)	16	12 ¾	14	14 5/8	Not Available	16
Screen Material or Perforation Type	torch-cut perforations	040 gauge Stancliff	wire wrapped stainless steel	14 in I.D. Roscoe Moss	Not Available	wire wrapped stainless steel
Screened Interval(s) (ft)	201-740	226-720	175-746	500-2000	210-760	200-725
Screen Diameter (in)	Not Available	12 ¾	14	14 5/8	Not Available	Not Available
Grouting/Sealing Materials	Not Available	neat cement	neat cement	neat cement	Not Available	Not Available
Grouting/Sealing Depth Interval (ft)	Not Available	52	50	40	Not Available	Not Available
Pump Setting (ft)	400	609	610	760	428	550
Rated Pump Capacity (gpm)	840	250	270	960	500	220
Average Pumping Rate (ft3/day)	161,711	57,754	50,053	184,813	96,257	42,353

PARAMETER						
Source Name or Identifier	St. Michaels Well	Torreon Well	Buckman # 1	Buckman # 2	Buckman # 3	Buckman # 3a
Date Drilled	1983	1997	1977	1977	Not Available	1995
Drilling Method	direct rotary	reverse rotary		mud rotary	Not Available	mud rotary
Total Depth (ft)	800	1,230 ft	1,093 ft	1,600	Not Available	1,500
Static Water Level (ft)	217	211 ft	387 ft	350	Not Available	365
Date of Water Level Measure	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
Casing Material	steel	steel	steel	steel	Not Available	steel
Casing Length (ft)	797	1,230	1,093	1,473	Not Available	1,490
Casing Height Above Ground Surface (in)	24	36	Not Available	Not Available	Not Available	36
Casing Diameter (in) (O.D.)	16	16	16	16	Not Available	1
Screen Material or Perforation Type	wire wrapped stainless steel	punched steel louver	stainless steel shuttered	stainless steel Layne shutter	Not Available	Roscoe Moss steel shutter
Screened Interval(s) (ft)	382-782	400-1,200	258-1,095	241-1,600	Not Available	500-1,490
Screen Diameter (in)		16	Not Available	Not Available	Not Available	Not Available
Grouting/Sealing Materials	neat cement	neat cement	neat cement	neat cement	Not Available	neat cement (Halliburton)
Grouting/Sealing Depth Interval (ft)	*52*	*80*	*60*	*80*	*Not Available*	*143*
Pump Setting (ft)	714	504	840	680	Not Available	693
Rated Pump Capacity (gpm)	490	400	546	534	Not Available	350
Average Pumping Rate (ft3/day)	94,332	77,005	103,957	102,802	Not Available	67,380

PARAMETER					
Source Name or Identifier	Buckman # 4	Buckman # 5	Buckman # 6	Buckman # 7	Buckman # 8
Date Drilled	1971	1972	1972	1990	1990
Drilling Method	mud rotary	mud rotary	mud rotary	mud rotary	mud rotary
Total Depth (ft)	1,200	1,200 ft	1,154	1,415	910
Static Water Level (ft)	432	205	275	266	37
Date of Water Level Measure	Not Available	Not Available	Not Available	Not Available	Not Available
Casing Material	steel	steel	steel	steel	steel
Casing Length (ft)	1,219	1,182	951	700	380
Casing Height Above Ground Surface (in)	Not Available	Not Available	12	24	24
Casing Diameter (in)	16	16	16	16	16.
Screen Material or Perforation Type	pipe-based, wire wrap	pipe-based, wire wrap	pipe-based, wire wrap	Roscoe Moss "full-flo"	Roscoe Moss "full-flo"
Screened Interval(s) (ft)	454 - 1,219	244-1,170	291-1,148	700-1,415	379-900
Screen Diameter (in)	Not Available	Not Available	Not Available	Not Available	Not Available
Grouting/Sealing Materials	neat cement	neat cement	neat cement	neat cement	neat cement
Grouting/Sealing Depth Interval (ft)	197	197	201	99	99
Pump Setting (ft)	750	750	730	800	620
Rated Pump Capacity (gpm)	374	294	766	700	530
Average Pumping Rate (ft3/day)	77,005	56,599	147, 465	134,760	102,000

PART 1 (B) SOURCE DATA *SURFACE WATER SYSTEMS(Direct Intakes from Reservoirs and Streams)*

PARAMETER		
Source Name or Identifier	Nichols Reservoir	McClure Reservoir
Annual average surface area of reservoir (acres)	30.36 (max) 26 (average)	variable (87.63 max)
Typical reservoir depth or range in depth (ft)	54.3 - 56.5	58.4-84.5
Average annual stream flow (ft3/sec)	Not Available	0.998 - 5.616 (inflow)
Type (drop inlet, tower & gate, perforated pipe, etc)	tower & gate	tower & gate
Construction material (concrete, steel, PVC, etc.)	concrete	concrete
Depth of intake or range of inlet depths (ft below ground or ft above mean sea level)	30 - 60	unknown
Site security (fencing, lock boxes, etc.)	fencing; patrolled	fencing, patrolled
Typical duration of use (hours per day)	24 (seasonal)	24 (seasonal)
Method of discharge (pump or gravity flow)	gravity flow	gravity flow
Year installed or constructed	1972	1926 (rebuilt 1949)

Note:

- Intakes on Nichols and McClure are of similar construction; water stored in McClure reservoir is allowed to settle, and is then piped through underground line into Nichols reservoir; below ground line from Nichols is plumbed direct. For purposes of the SWAPP, a *Direct Intake* is defined as an open or exposed collection structure that draws surface water directly from a stream or reservoir. An Indirect Intake is defined as a buried or unexposed collection system that collects surface water through artificial filtration media or through native geologic media. Springs and intakes that draw water classified as *Ground Water Under the Direct Influence of Surface Water* are considered Indirect Intakes.

PART 2 (A) SENSITIVITY ANALYSIS: *GROUND WATER SYSTEM*

1. SENSITIVITY RANKING FOR *DEPTH OF SCREENED INTERVAL*

Screened Interval Depth	less than 100 feet	101 – 200 feet	201 – 500 feet	501 – 700 feet	greater than 700 feet
Sensitivity Rank	high	moderately high	moderate	moderately low	low
Agua Fria Well			✓		
Alto Well			✓		
Ferguson Well			✓		
Northwest Well				✓	
Osage Well			✓		
Santa Fe Well			✓		
St. Michaels Well			✓		
Torreon Well			✓		
Buckman # 1			✓		
Buckman # 2			✓		
Buckman # 3			✓		
Buckman #3A				✓	
Buckman # 4			✓		
Buckman # 5			✓		
Buckman # 6			✓		
Buckman # 7					✓
Buckman # 8			✓		

2. SENSITIVITY RANKING FOR *AVAILABLE CONSTRUCTION RECORDS*

Construction Information Available (y/n)	Casing diameter, length and materials	Location of screened interval(s)	Total completion depth	Static water level at completion	Pump type, size and setting	Drilling log or equivalent	Total Points	Rank Assigned (see Ranking Guide, below)
Points for Yes	2	3	3	2	2	3	15	
Agua Fria Well	✓	✓	✓	✓	✓	✓	15	low
Alto Well	✓	✓	✓	✓	✓	✓	15	low
Ferguson Well	✓	✓	✓	✓	✓	✓	15	low
Northwest Well	✓	✓	✓	✓	✓	✓	15	low
Osage Well	✓	✓	✓	✓	✓	✓	15	low
Santa Fe Well	✓	✓	✓	✓	✓	✓	15	low
St. Michaels Well	✓	✓	✓	✓	✓	✓	15	low
Torreon Well	✓	✓	✓	✓	✓	✓	15	low
Buckman # 1	✓	✓	✓	✓	✓	✓	15	low
Buckman # 2	✓	✓	✓	✓	✓	✓	15	low
Buckman # 3		✓	✓	✓			8	moderate
Buckman #3A	✓	✓	✓	✓	✓	✓	15	low
Buckman # 4	✓	✓	✓	✓	✓	✓	15	low
Buckman # 5	✓	✓	✓	✓	✓	✓	15	low
Buckman # 6	✓	✓	✓	✓	✓	✓	15	low
Buckman # 7	✓	✓	✓	✓	✓	✓	15	low
Buckman # 8	✓	✓	✓	✓	✓	✓	15	low

RANKING GUIDE

Point Value	Sensitivity Rank
0-3	high
4-6	moderately high
7-9	moderate
10-12	moderately low
13-15	low

2B. SENSITIVITY RANKING FOR *WELL INTEGRITY*

Physical Integrity of Supply Well	Is the well located outside of an area susceptible to flooding?	Does well casing terminate at least 12 inches above floor or ground level?	Is the wellhead properly sealed?	Is annular space pressure-grouted to depth of at least 20 feet?	Is there a concrete pad around the wellhead that slopes away from casing?	Is well vent screened and oriented to open downward or is cap vented?	Are valves, pump controls and meters properly maintained and operated?	Is the wellhead fenced, housed or property protected?	Total Points	Rank Assigned (see Ranking Guide, below)
Points for Yes	2	2	3	3	1	1	1	2	15	
Agua Fria Well	✓	✓	✓		✓	✓	✓	✓	12	moderately low
Alto Well	✓	✓	✓	✓	✓	✓	✓		13	low
Ferguson Well	✓	✓	✓	✓	✓	✓	✓	✓	15	low
Northwest Well	✓	✓	✓	✓	✓	✓	✓	✓	15	low
Osage Well	✓	✓	✓		✓	✓	✓	✓	12	moderately low
Santa Fe Well	✓	✓	✓		✓	✓	✓	✓	12	moderately low
St. Michaels Well	✓	✓	✓	✓	✓	✓	✓	✓	15	low
Torreon Well	✓	✓	✓	✓	✓	✓	✓	✓	15	low
Buckman # 1	✓	✓	✓	✓	✓	✓	✓	✓	15	low

Buckman # 2	✓	✓	✓	✓	✓	✓	✓	✓	15	low
Buckman # 3	✓	✓	✓	✓	✓	✓	✓	✓	15	low
Buckman #3A	✓	✓	✓	✓	✓	✓	✓	✓	15	low
Buckman # 4	✓	✓	✓	✓	✓	✓	✓	✓	15	low
Buckman # 5	✓	✓	✓	✓	✓	✓	✓	✓	15	low
Buckman # 6	✓	✓	✓	✓	✓	✓	✓	✓	15	low
Buckman # 7	✓	✓	✓	✓	✓	✓	✓	✓	15	low
Buckman # 8	✓	✓	✓	✓	✓	✓	✓	✓	15	low

3. DRASTIC INDEX PARAMETERS & RANKING

	Depth to Water (ft)	Net Annual Recharge (in/yr)*	Aquifer Media (material type)	Soil Type (texture)**	General Topography (%)	Vadose Zone Impact (material type)	Hydraulic Conductivity (gpd/ft2)***	Index Value:	Rank Assigned (see Ranking Guide, below):
Agua Fria Well	238	0.2	sand and gravel	fine sandy loam	0-5	sand and gravel	7.5	95	low
Alto Well	156	0.2	sand and gravel	fine sandy loam	0-5	sand and gravel	7.5	95	low
Ferguson Well	137	0.2	sand and gravel	fine sandy loam	0-5	sand and gravel	7.5	95	low
Northwest Well	408	0.2	sand and gravel	fine sandy loam	0-5	sand and gravel	7.5	95	low
Osage Well	89	0.2	sand and gravel	fine sandy loam	0-5	sand and gravel	7.5	105	moderately low
Santa Fe Well	213	0.2	sand and gravel	fine sandy loam	0-5	sand and gravel	7.5	95	low
St. Michaels Well	217	0.2	sand and gravel	fine sandy loam	0-5	sand and gravel	7.5	95	low
Torreon Well	211	0.2	sand and gravel	fine sandy loam	0-5	sand and gravel	7.5	95	low
Buckman #1	387	0.2	sand and gravel	sandy clay loam	5-10	sand and gravel	7.5	84	low

	Depth to Water (ft)	Net Annual Recharge (in/yr)*	Aquifer Media (material type)	Soil Type (texture)**	General Topography (%)	Vadose Zone Impact (material type)	Hydraulic Conductivity (gpd/ft2)***	Index Value:	Rank Assigned (see Ranking Guide, below):
Buckman #2	350	0.2	sand and gravel	sandy clay loam	5-10	sand and gravel	7.5	84	low
Buckman #3	377	0.2	sand and gravel	sandy clay loam	5-10	sand and gravel	7.5	84	low
Buckman #3A	365	0.2	sand and gravel	sandy clay loam	5-10	sand and gravel	7.5	84	low
Buckman #4	432	0.2	sand and gravel	sandy clay loam	5-10	sand and gravel	7.5	84	low
Buckman #5	205	0.2	sand and gravel	sandy clay loam	5-10	sand and gravel	7.5	84	low
Buckman #6	275	0.2	sand and gravel	sandy clay loam	5-10	sand and gravel	7.5	84	low
Buckman #7	266	0.2	sand and gravel	sandy clay loam	5-10	sand and gravel	7.5	84	low
Buckman #8	37	0.2	sand and gravel	sandy clay loam	5-10	sand and gravel	7.5	104	moderately low

* Robson and Banta, 1995
** Folks, 1975
*** Shomaker and Associates, 1995

RANKING GUIDE

DRASTIC Index	***Sensitivity Rank***
greater than 200	high
171-200	moderately high
131-170	moderate
100-130	moderately low
less than 100	low

4. COMPOSITE SENSITIVITY RANKING FOR GROUND WATER SUPPLIES
Each sensitivity rank determined from the preceding ranking guides is given a numerical value, and a composite sensitivity rank is assigned using the formula
Sensitivity Rank = Well Depth Rank + Well Construction/Integrity Rank + DRASTIC Index Rank

	Rank for Depth of Screened Interval					Rank for Well Construction Records					Rank for Integrity of Construction					Rank for DRASTIC Index						
	High (25 points)	Moderately High (20 points)	Moderate (15 points)	Moderately Low (10 points)	Low (5 points)	High (25 points)	Moderately High (20 points)	Moderate (15 points)	Moderately Low (10 points)	Low (5 points)	High (25 points)	Moderately High (20 points)	Moderate (15 points)	Moderately Low (10 points)	Low (5 points)	High (25 points)	Moderately High (20 points)	Moderate (15 points)	Moderately Low (10 points)	Low (5 points)	Point Sum	Rank Assigned (see Ranking Guide, below)
Agua Fria Well			✓							✓				✓						✓	35	moderately low
Alto Well			✓							✓					✓					✓	30	moderately low
Ferguson Well			✓							✓					✓					✓	30	moderately low
Northwest Well				✓						✓					✓					✓	25	low
Osage Well			✓							✓				✓					✓		40	moderately low
Santa Fe Well			✓							✓				✓						✓	35	moderately low
St. Michaels Well			✓							✓					✓					✓	30	moderately low
Torreon Well			✓							✓					✓					✓	30	moderately low
Buckman # 1			✓							✓					✓					✓	30	moderately low
Buckman # 2			✓							✓					✓					✓	30	moderately low
Buckman # 3			✓					✓							✓					✓	40	moderately low

	Rank for Depth of Screened Interval					Rank for Well Construction Records					Rank for Integrity of Construction					Rank for DRASTIC Index						
	High (25 points)	Moderately High (20 points)	Moderate (15 points)	Moderately Low (10 points)	Low (5 points)	High (25 points)	Moderately High (20 points)	Moderate (15 points)	Moderately Low (10 points)	Low (5 points)	High (25 points)	Moderately High (20 points)	Moderate (15 points)	Moderately Low (10 points)	Low (5 points)	High (25 points)	Moderately High (20 points)	Moderate (15 points)	Moderately Low (10 points)	Low (5 points)	Point Sum	Rank Assigned (see Ranking Guide, below)
Buckman #3A				✓						✓					✓					✓	25	low
Buckman # 4			✓							✓					✓					✓	30	moderately low
Buckman # 5			✓							✓					✓					✓	30	moderately low
Buckman # 6			✓							✓					✓					✓	30	moderately low
Buckman # 7					✓					✓					✓					✓	20	low
Buckman # 8			✓							✓					✓				✓		35	moderately low

RANKING GUIDE

Sum of Sensitivity Points	Composite Sensitivity Rank
90-100	high
70-85	moderately high
50-65	moderate
30-45	moderately low
20-25	low

PART 2 (B) SENSITIVITY ANALYSIS: *SURFACE WATER SYSTEM*

1. *Sensitivity Ranking for Reservoir Area, Stream Flow Rate and Area of Wetlands or Marshes at Springs*

Average Reservoir Size (acres)	Average Annual Stream Flow (cfs)	Area of wetland or marsh (acres)	Sensitivity Rank	Nichols Reservoir	McClure Reservoir
less than 100	less than 100	greater than 2	high	✓	✓
100-200	100-225	1 - 2	moderately high		
200-500	225-350	½ - 1	moderate		
500-1000	350-500	¼ - ½	moderately low		
more than 1,000	greater than 500	none	low		

2. SENSITIVITY RANKING FOR DRAINAGE BASIN IMPACTS ON RAW WATER QUALITY

Water Quality Parameter	Points for Yes	Nichols Reservoir	McClure Reservoir
Does daily average raw water turbidity regularly exceed ten NTU (answer "yes" if raw water quality not monitored)?	5		
Does monthly raw water TOC regularly exceed 8.0 mg/L and is raw water alkalinity less than 60 mg/L as $CaCO_3$ (answer "yes" if unmonitored)?	5		
Is any reach of the water source upstream from the intake listed as threatened or impaired under Section 303 (d) of the Clean Water Act?	3		
Has urbanization, overgrazing, logging, wildfire or other watershed phenomenon reduced or impacted riparian vegetation upstream from the intake?	3		
Does the watershed consist of steep topography (slopes greater than 30%) and sparse vegetation (less than 20% coverage)?	2		
Is watershed response to storm events quick and intense (i.e., is the region upstream of the intake prone to flash flooding)?	2	✓	✓

Total Points	20	2	2
Rank Assigned (see Ranking Guide, below)		low	low

RANKING GUIDE

Point Value	***Sensitivity Rank***
13-20	high
9-12	moderately high
6-8	moderate
3-5	moderately low
0-2	low

3. SENSITIVITY RANKING FOR INTEGRITY & MAINTENANCE OF INTAKE STRUCTURES

Integrity and Maintenance of Direct and Indirect Intake Facilities	Points for Yes	Nichols Reservoir	McClure Reservoir
Have regulatory deficiencies identified in the most recent sanitary survey been corrected? (Answer "yes" if no deficiencies)	10	✓	✓
Is telemetry or other form of monitoring provided that alerts operator of an upstream *spill or accident*?	*10*		
Can intake be closed or adjusted by operator during high runoff, reservoir turnover, or other events affecting water *quality*?	10	✓	✓
Does PWS maintain an emergency spill or upstream accident response plan?	5	✓	✓
Is access to the area immediately around the intake restricted or controlled from recreational users, wildlife, livestock, etc.?	5	✓	✓
Is there an upstream reservoir, detention pond, wetland or other feature that intercepts or buffers nutrient and sediment loading to the intake?	5	✓	
Is conveyance between intake and treatment facility lined, enclosed or otherwise protected from contamination?	3	✓	✓
Are intakes, screens and drain lines properly maintained and free of debris?	2	✓	✓

Total Points	50	40	35
Rank Assigned (see Ranking Guide, below)	-	moderately low	moderately low

RANKING GUIDE

Point Value	***Sensitivity Rank***
0-10	high
11-20	moderately high
21-30	moderate
31-40	*moderately low*
41-50	low

4. WRASTIC Index = 18

Source	Nichols Reservoir	McClure Reservoir
Wastewater Presence	Not Present	Not Present
Recreational Impact	Not Present	Not Present
Agricultural Impact	Wildlife Activity & Pesticide Application	Wildlife Activity & Pesticide Application
Size of Watershed (square miles)	*26.571*	*26.571*
Transportation Avenues	Not Present	Not Present
Industrial Impact	Not Present	Not Present
Vegetative Ground Cover (%)	35-50	35-50
Rank	Low	Low

RANKING GUIDE

Point Value	***Sensitivity Rank***
50-82	*high*
43-49	moderately high
35-42	moderate
27-34	moderately low
0-26	low

5. COMPOSITE SENSITIVITY RANKING FOR SURFACE WATER SUPPLIES:
Sensitivity Rank = Area Rank + Integrity & Maintenance Rank + Raw Water Quality Rank + *WRASTIC Index Rank*

	Nichols Reservoir	McClure Reservoir
Reservoir Area, Stream Flow Rate and Spring Area		
High (25 points)	25	25
Moderately High (20 points)		
Moderate (15 points)		
Moderately Low (10 points)		
Low (5 points)		
Drainage Basin Impacts on Raw Water Quality		
High (25 points)		
Moderately High (20 points)		
Moderate (15 points)		
Moderately Low (10 points)		
Low (5 points)	5	5
Integrity of Construction and Maintenance		
High (25 points)		
Moderately High (20 points)		
Moderate (15 points)		
Moderately Low (10 points)	10	10
Low (5 points)		
WRASTIC Index		
High (25 Points)		
Moderately High (20 Points)		
Moderate (15 Points)		
Moderately Low (10 Points)		
Low (5 Points)	5	5
Point Sum		
Rank Assigned (see Ranking Guide, below)	45	45
Sensitivity Rank	Moderate	Moderate

RANKING GUIDE

Sum of Sensitivity Points	Composite Sensitivity Rank
80-100	high
60-80	moderately high
40-60	moderate
20-40	moderately low
0-20	low

PART 3 VULNERABILITY ANALYSES:

3.1 GROUND WATER SYSTEMS

PSOC Ranking DETERMINATION GUIDE				
	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

Agua Fria Well				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Base Map	Secondary Highway	B	0-2	Low
Base Map	Secondary Highway	C	0-4	Low
Map Legend	NM Impaired Water	C	0-4	Low

FINAL VULNERABILITY = LOW

Alto Well				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Appendix K	MSL	A	1+	High
Appendix K	MSL	B	0-2	Low
Map Legend	NM Impaired Water	B	0-2	Low
Appendix K	CFB	C	0-4	Low
Appendix K	MSL	C	0-4	Low
Map Legend	NM Impaired Water	C	0-4	Low

FINAL VULNERABILITY = HIGH

Ferguson well				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Map Legend	NM Impaired Water	A	1+	High
Appendix K	MSL	B	0-2	Low
Map Legend	NM Impaired Water	B	0-2	Low
Appendix K	CBS	C	0-4	Low
Appendix K	CHG	C	0-4	Low
Appendix K	MSL	C	0-4	Low
Base Map	Primary Highway	C	0-4	Low
Map Legend	NM Impaired Water	C	0-4	Low
Map Legend	Petroleum Storage	C	0-4	Low

FINAL VULNERABILITY RANK = HIGH

Northwest WELL				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
-	PSOC not Identified	-	-	Low

FINAL VULNERABILITY RANK = HIGH

Osage well				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Base Map	Secondary Highway	A	1+	High
Base map	Secondary Highway	B	0-2	Low
Map Legend	NM Impaired Water	B	0-2	Low
Base Map	Secondary Highway	C	0-4	Low
Map Legend	NM Impaired Water	C	0-4	Low

FINAL VULNERABILITY RANK = HIGH

Santa Fe well				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Base Map	Acequia	A	1+	High
Base Map	Acequia	B	0-2	Low
Map Legend	Monitoring Well	B	0-2	Low
Map Legend	Underground Injection Well	B	5-7	Moderate
Appendix K	CFA	C	0-4	Low
Appendix K	CFB	C	0-4	Low

Appendix K	CHG	C	0-4	Low
Appendix K	IPU	C	0-4	Low
Appendix K	IRG	C	0-4	Low
Appendix K	MMP	C	0-4	Low
Base Map	Acequia	C	0-4	Low
Base Map	Cemetery	C	0-4	Low
Map Legend	Monitoring Well	C	0-4	Low
Map Legend	Petroleum Storage	C	0-4	Low
Map Legend	Underground Injection Well	C	0-4	Low

FINAL VULNERABILITY RANK = HIGH

Saint Michael's WELL				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Base Map	Primary Highway	A	1+	High
Base Map	Railroad	A	1+	High
Map Legend	Hazardous & Solid Waste	A	1+	High
Appendix K	CAR	B	0-2	Low
Base Map	Primary Highway	B	0-2	Low
Base Map	Railroad	B	0-2	Low
Map Legend	Hazardous & Solid Waste	B	0-2	Low
Map Legend	Petroleum Storage	B	0-2	Low
Appendix K	CAR	C	0-4	Low
Appendix K	CPS	C	0-4	Low
Appendix K	CSS	C	0-4	Low
Base Map	Arroyo	C	0-4	Low
Base Map	Primary Highway	C	0-4	Low
Base Map	Railroad	C	0-4	Low
Map Legend	Hazardous/Solid Waste Fac.	C	0-4	Low
Map Legend	Petroleum Storage	C	0-4	Low

FINAL VULNERABILITY RANK = HIGH

Torreon well				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Map Legend	NM Impaired Water	A	1+	High
Map Legend	NM Impaired Water	B	0-2	Low
Appendix K	MSL	C	0-4	Low
Map Legend	NM Impaired Water	C	0-4	Low

FINAL VULNERABILITY RANK = HIGH

Buckman well # 1				
Map Reference	*Description*	Zone of Influence	Number of Type	Vulnerability Rank
Map Legend	NM Impaired Water	A	1+	High
Map Legend	NM Impaired Water	B	0-2	Low
Map Legend	NM Impaired Water	C	0-4	Low

FINAL VULNERABILITY = HIGH

Buckman well # 2				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Appendix K	IUR	B	0-2	Low
Appendix K	IUR	C	0-4	Low

FINAL VULNERABILITY RANK = LOW

Buckman well # 3				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Base Map	Arroyo	A	1+	High
Base Map	Arroyo	B	0-2	Low
Appendix K	IUR	C	0-4	Low
Base Map	Arroyo	C	0-4	Low

FINAL VULNERABILITY RANK = HIGH

Buckman well # 3A				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Base Map	Arroyo	B	0-2	Low
Appendix K	IUR	C	0-4	Low
Base Map	Arroyo	C	0-4	Low

FINAL VULNERABILITY RANK = LOW

Buckman well # 4				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
-	PSOC not identified	-	-	Low

FINAL VULNERABILITY RANK = LOW

Buckman well # 5				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
-	PSOC not identified	-	-	Low

FINAL VULNERABILITY RANK = LOW

Buckman well # 6				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Appendix K	IUR	C	0-4	Low

FINAL VULNERABILITY RANK = LOW

Buckman well # 7				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Base Map	Arroyo	C	0-4	Low

FINAL VULNERABILITY RANK = LOW

Buckman well # 8				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Appendix K	IUR	B	0-2	Low
Map Legend	NM Impaired Water	B	0-2	Low
Appendix K	IUR	C	0-4	Low
Map Legend	NM Impaired Water	C	0-4	Low

FINAL VULNERABILITY RANK = LOW

3.2 SURFACE WATER SYSTEMS:

Nicholas Reservoir				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
-	PSOC Not Located-	-	-	Low

FINAL VULNERABILITY RANK = LOW

McClure Reservoir				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank

-	PSOC Not Located-	-	-	Low

FINAL VULNERABILITY RANK = LOW

SUSCEPTIBILITY RANKING GUIDE

	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

SUSCEPTIBILITY RANKS

Source Name	Sensitivity Rank	Vulnerability Rank	Susceptibility Rank
Agua Fria Well	Moderately Low	Low	Moderately Low
Alto Well	Moderately Low	Low	Moderately high
Ferguson Well	Moderately Low	High	Moderately High
Northwest Well	Low	Low	Low
Osage Well	Moderately Low	High	Moderately High
Santa Fe Well	Moderately Low	High	Moderately High
St. Michael's Well	Moderately Low	High	Moderately High
Torreon Well	Moderately Low	High	Moderately High

Source Name	Sensitivity Rank	Vulnerability Rank	Susceptibility Rank
Buckman # 1	Moderately Low	High	Moderately High
Buckman # 2	Moderately Low	Low	Moderately low
Buckman # 3	Moderately Low	Low	Moderately Low
Buckman #3A	Low	Low	Low
Buckman # 4|0	Moderately Low	Low	Moderately Low
Buckman # 5	Moderately Low	Low	Moderately Low
Buckman # 6	Moderately Low	Low	Moderately Low
Buckman # 7	Low	Low	Low
Buckman # 8	Moderately Low	Low	Moderately Low
McClure Reservoir	Moderate	Low	Moderately Low
Nichols Reservoir	Moderate	Low	Moderately 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, [14] 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)

[14] *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!

EXAMPLE PRESS RELEASE

[*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.

EXAMPLE PUBLIC SERVICE ANNOUNCEMENT

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

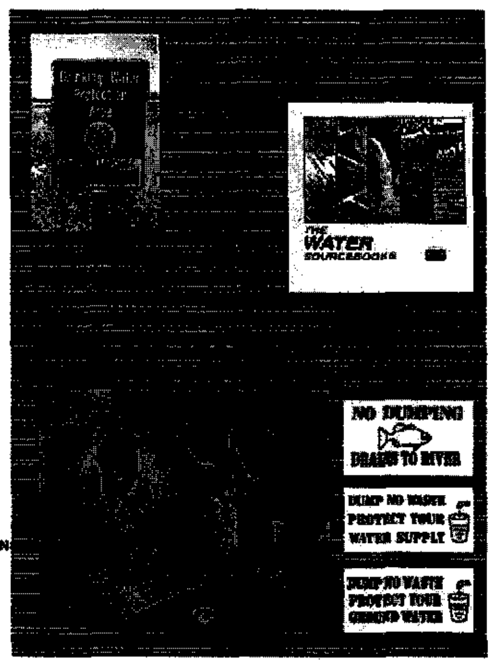
LEGISLATIVE (Regulatory)
- Regional Source Water Protection Districts
- Land Banking

POINT SOURCE POLLUTION RESTRICTION
- Waste Processing Plants

LAND ACQUISITION (Non-Regulatory & Regulatory)

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

A Variety of Resources are Available



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)

EXAMPLE MANAGEMENT TOOL

____
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
City of Santa Fe Water System
Public Water System # 05126
Date:

Your Water Utility Logo, Picture, or Graphic Here!

Prepared by
City of Santa Fe Water Utility &
The New Mexico Environment Department Drinking Water Bureau
Funded under the Federal Safe Drinking Water Amendments of 1996

The City of Santa Fe 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 City of Santa Fe water utility. The SWAPP complies with the requirements for source water protection defined under the *Safe Drinking Water Act Amendments of 1996*. In 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, the executive branch agency presents the (NAME) Utility with the attached (Certificate/Letter of Commendation).

SOURCE WATER PROTECTION PLAN OF THE CITY OF SANTA FE 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)[15]

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).

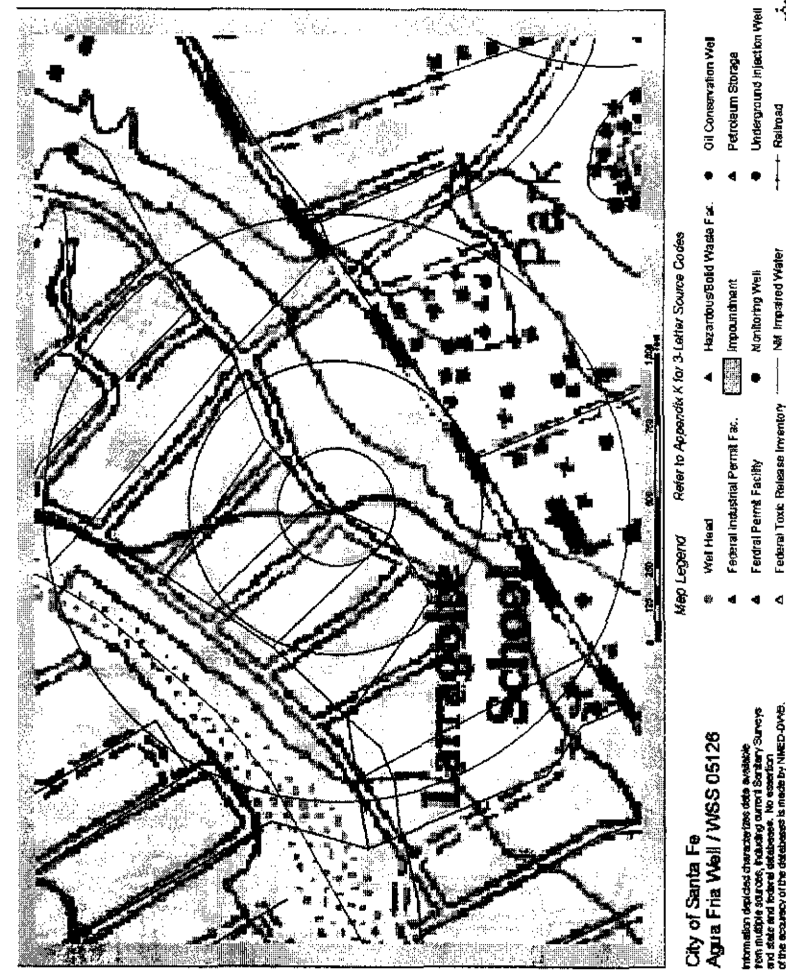
STEP 2

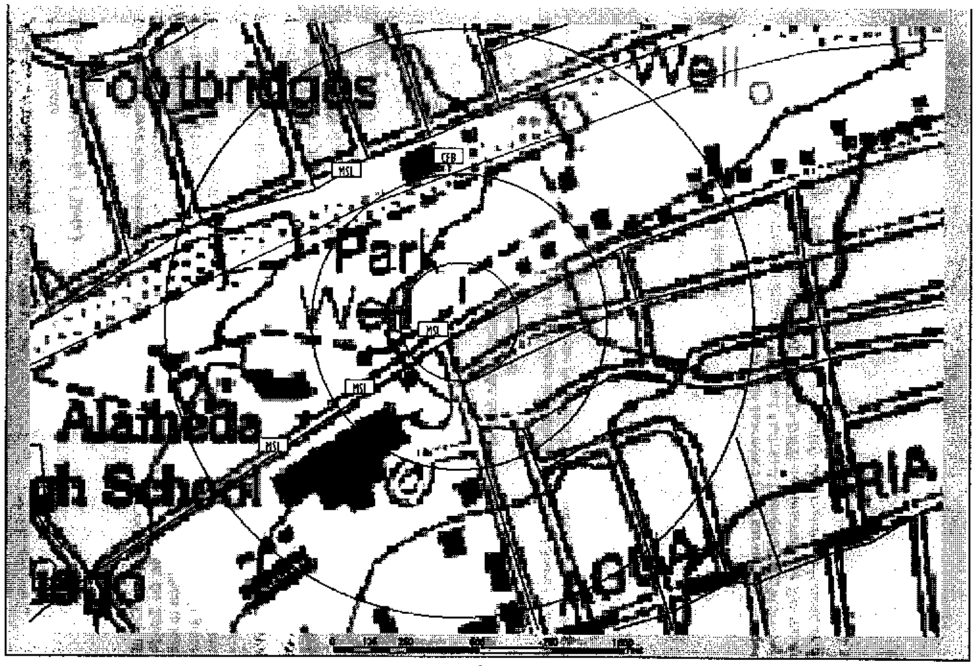
5) Describe the water supply system.

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.***

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



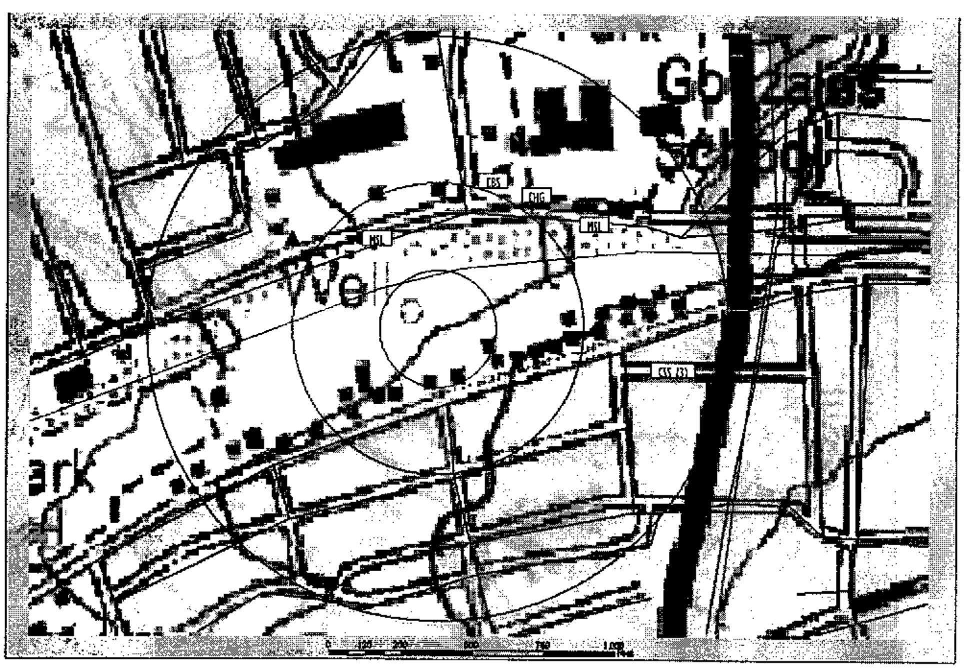


City of Santa Fe
Alto Well / WSS 05126

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

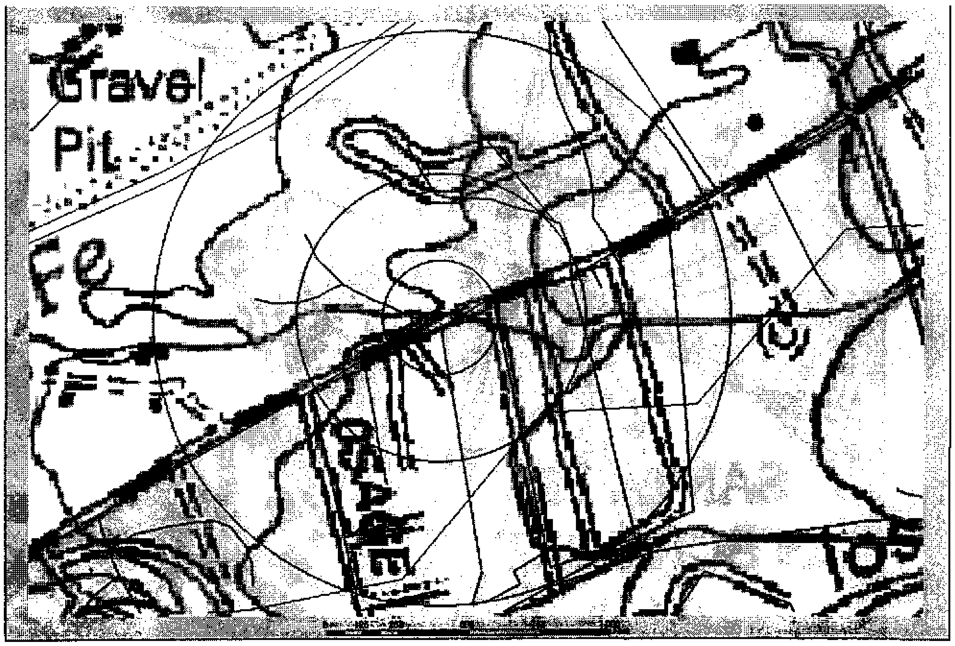


City of Santa Fe
Ferguson Well / WSS 05126

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

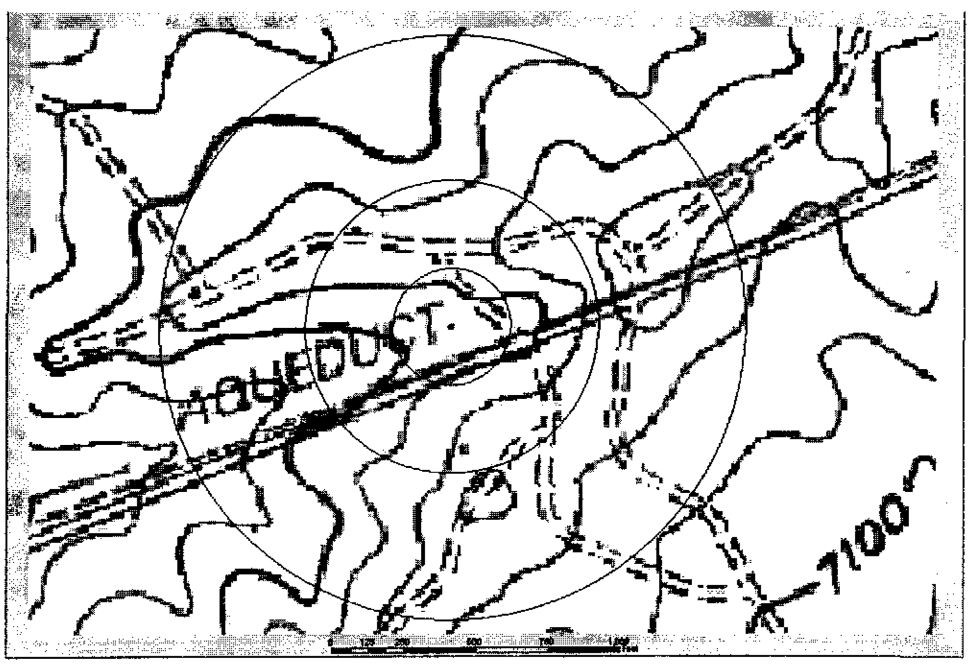


City of Santa Fe
Osage Well / WSS 05126

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

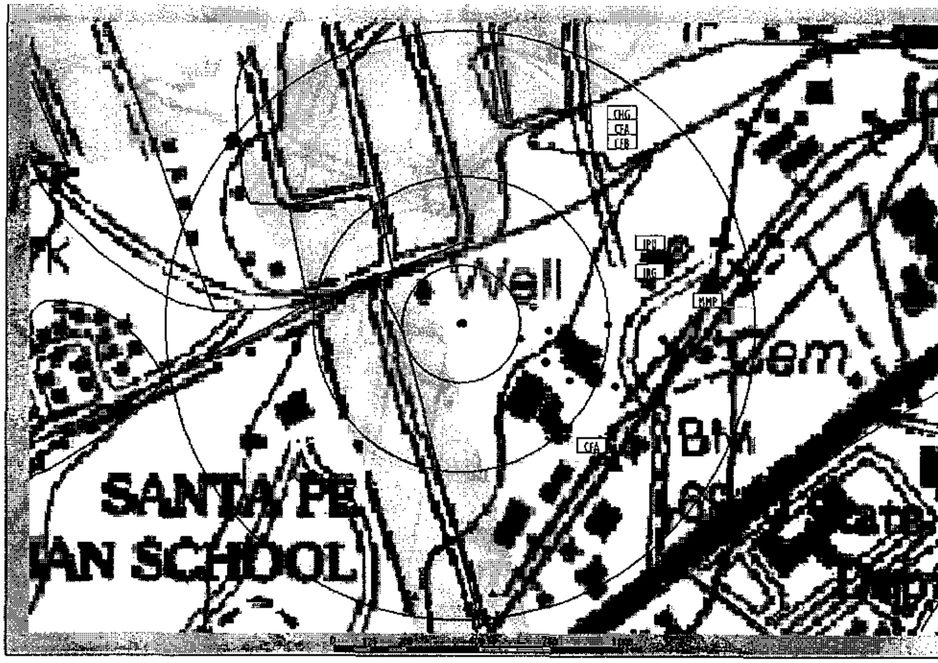


City of Santa Fe
North West Well / WSS 05126

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



City of Santa Fe
Santa Fe Well / WSS 05126

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*

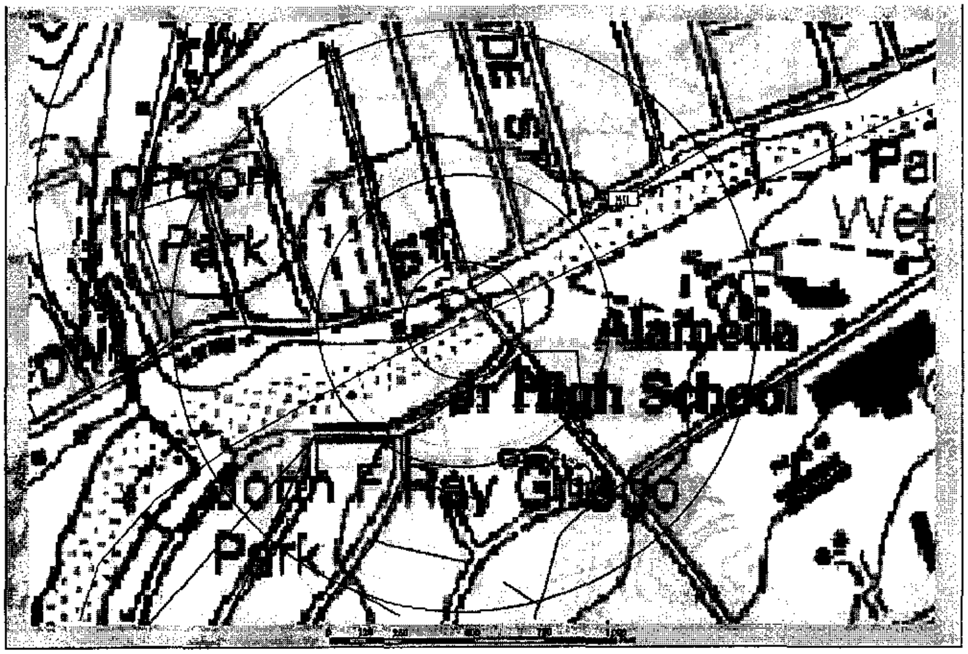
- Well Head
- Federal Industrial Permit Fac.
- Ferdral Permit Facility
- Federal Toxic Release Inventory
- Hazardous/Solid Waste Fac.
- Impoundment
- Monitoring Well
- NM Impaired Water
- Oil Conservation Well
- Petroleum Storage
- Underground Injection Well
- Railroad
- Roadway

City of Santa Fe
Saint Michael's Well / WSS 05126

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

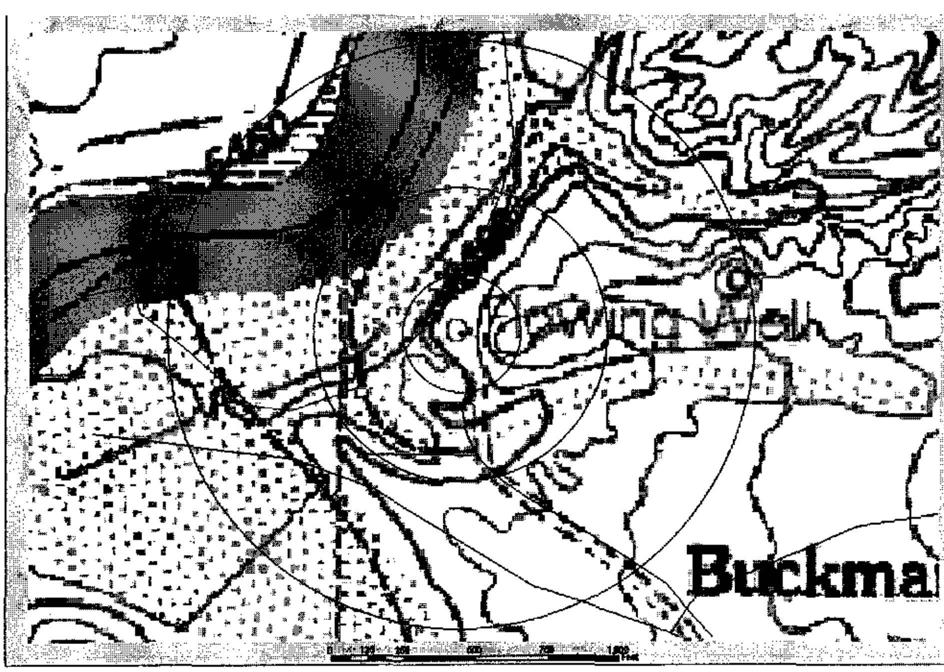


City of Santa Fe
Torreon Well / WSS 05126

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

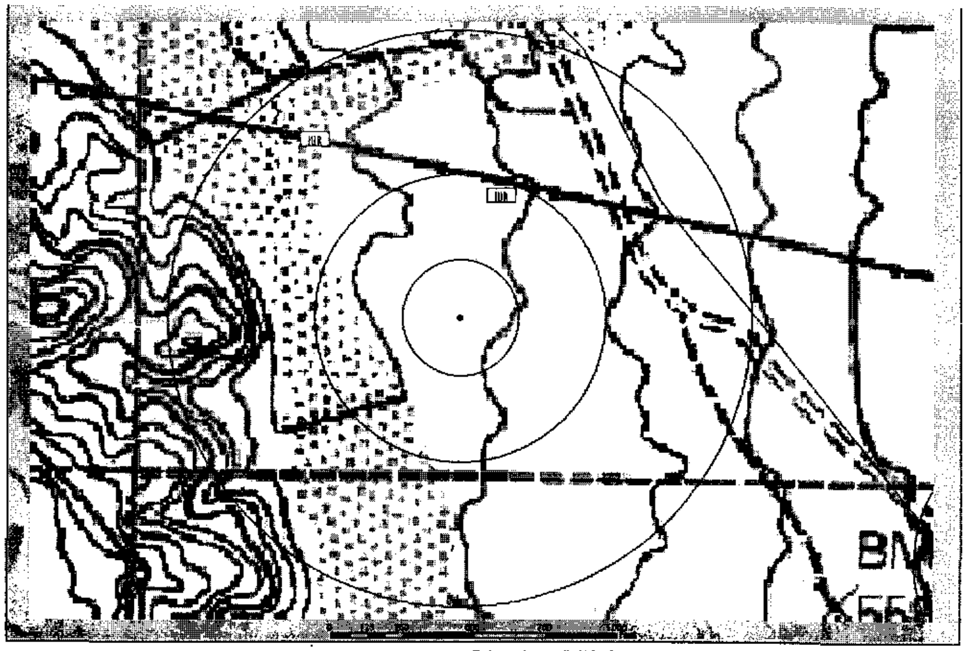


City of Santa Fe
Buckman Well 1 / WSS 05126

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

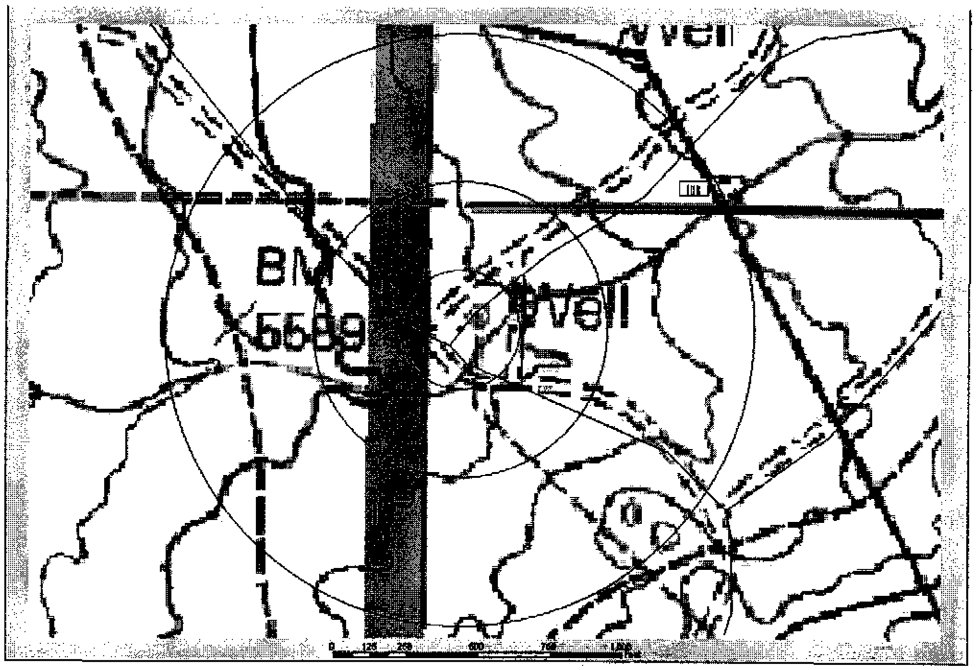


City of Santa Fe
Buckman Well 2 / WSS 05126

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

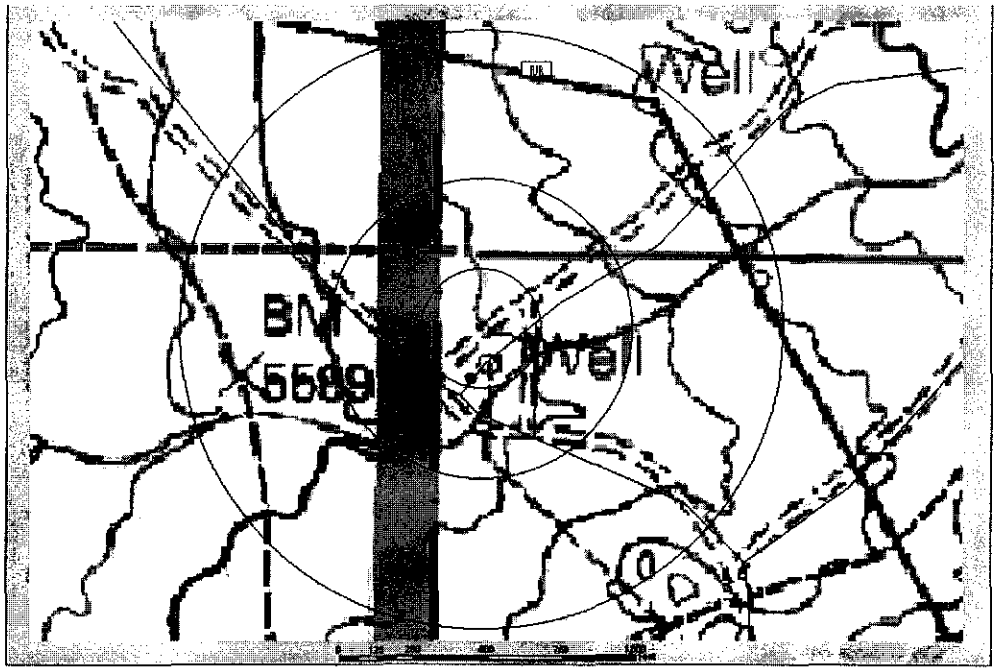


City of Santa Fe
Buckman Well 3 / WSS 05126

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

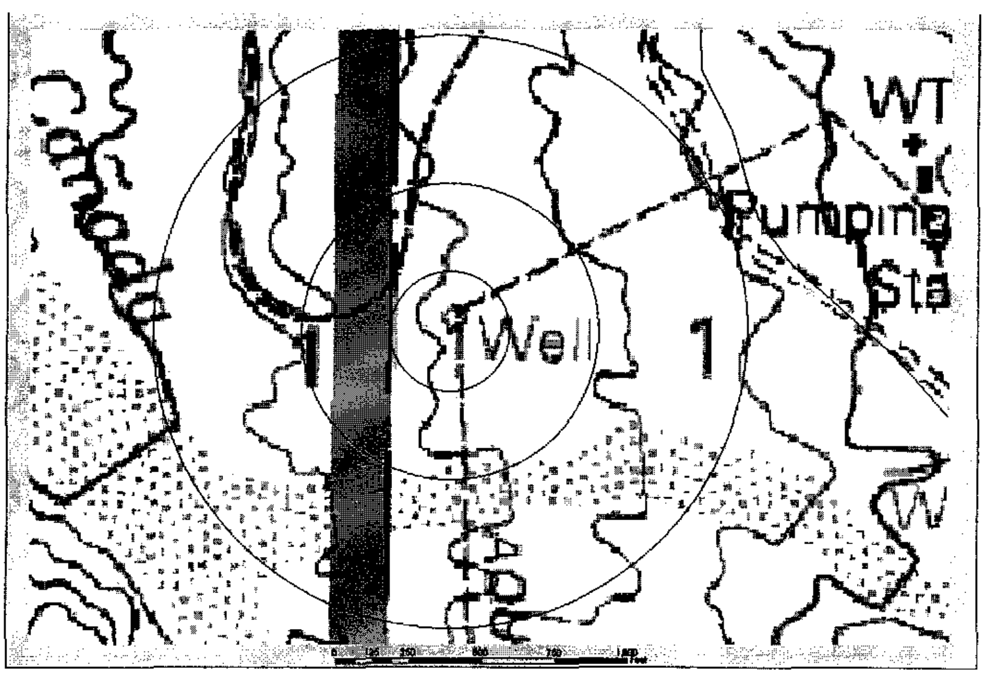


City of Santa Fe
Buckman Well 3A / WSS 05126

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

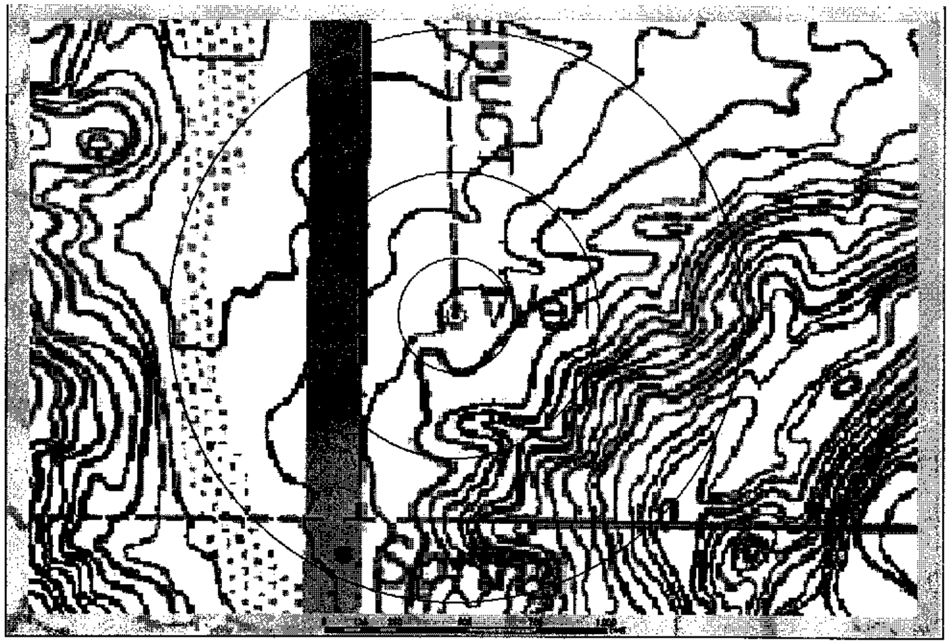


City of Santa Fe
Buckman Well 4 / WSS 05126

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

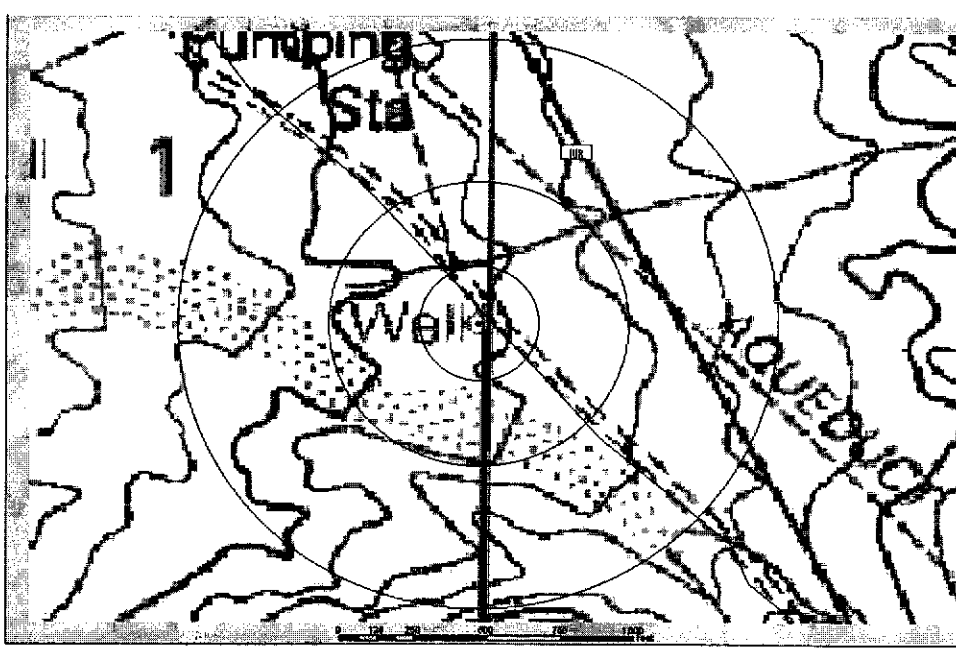


City of Santa Fe
Buckman Well 5 / WSS 05126

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

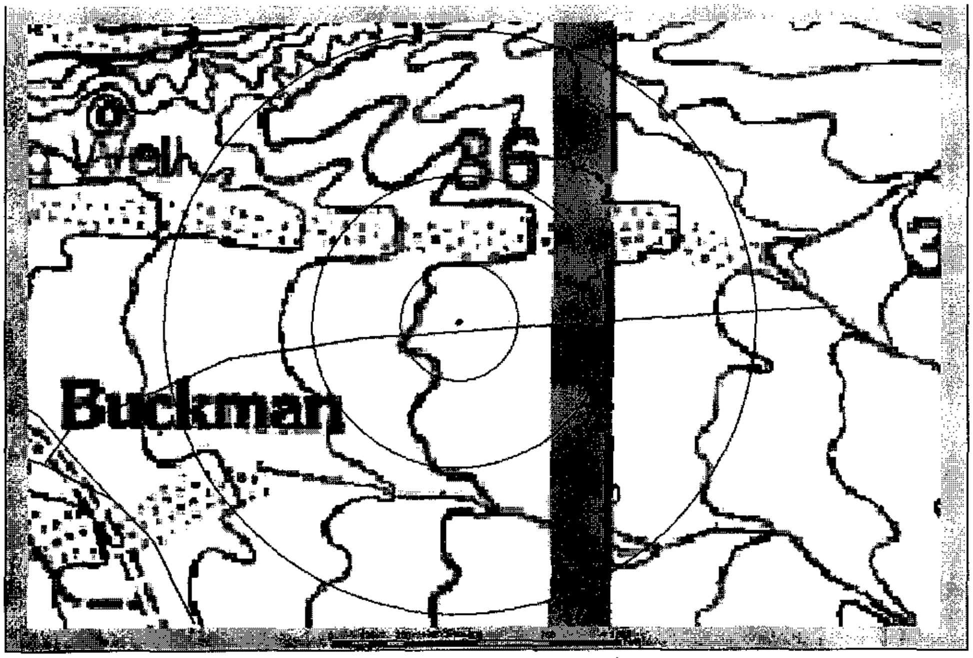


City of Santa Fe
Buckman Well 6 / WSS 05126

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

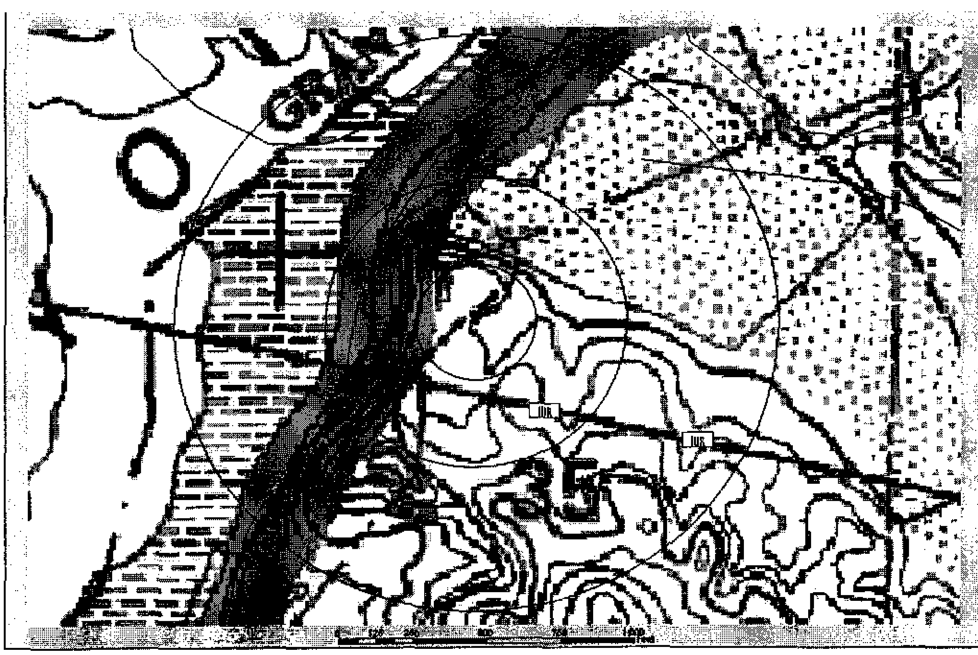


City of Santa Fe
Buckman Well 7 / WSS 05126

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

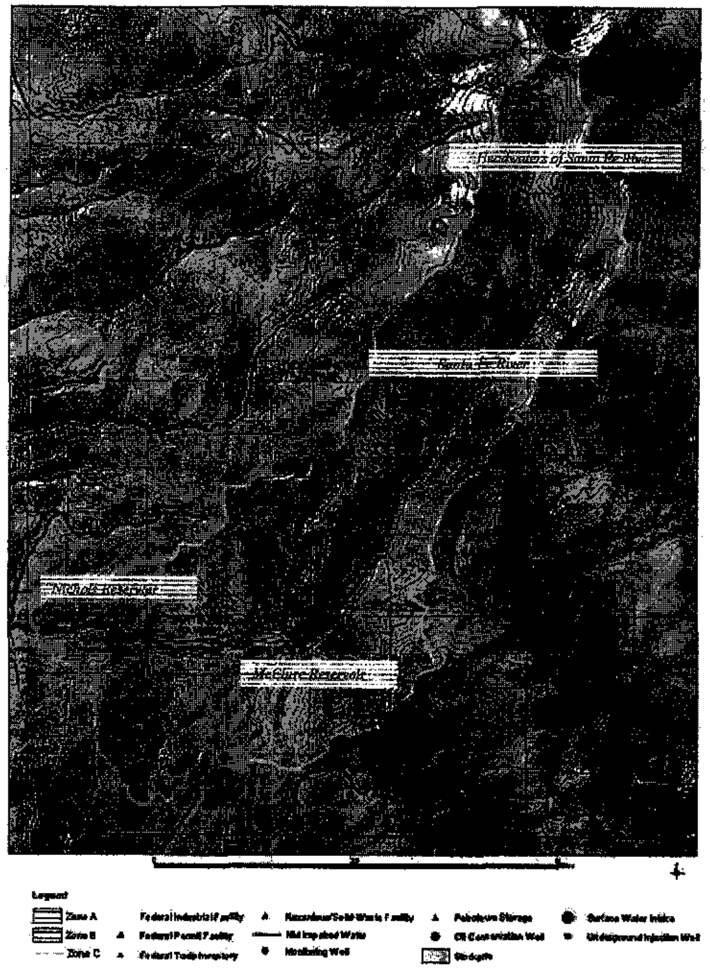


City of Santa Fe
Buckman Well 8 / WSS 05126

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.

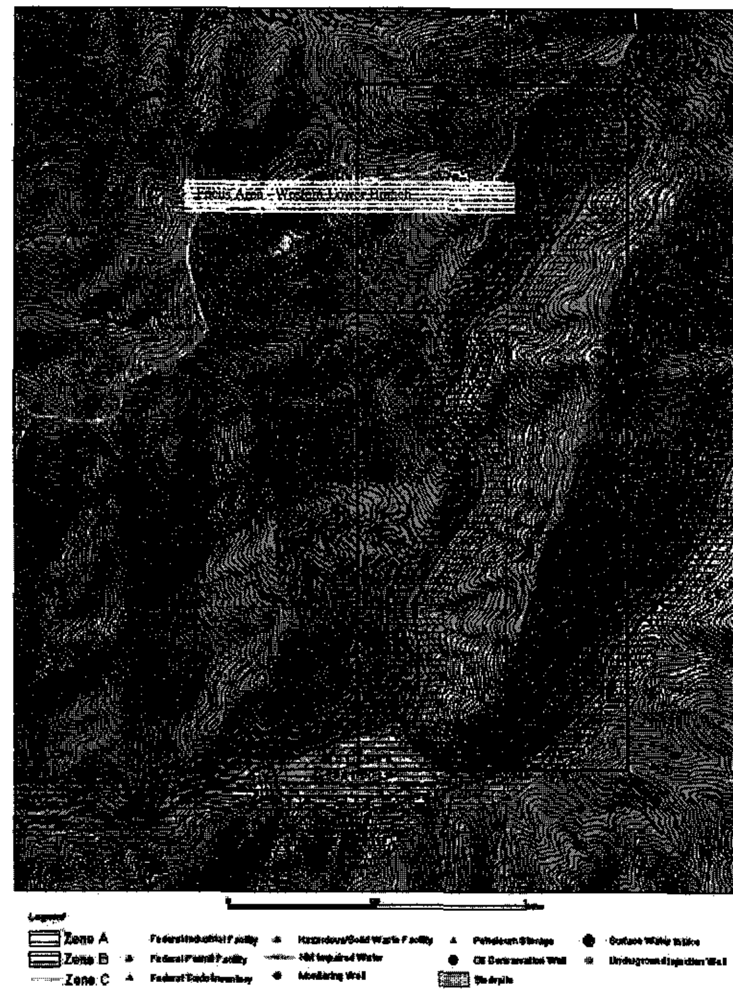
Map Legend *Refer to Appendix K for 3-Letter Source Codes*

- 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



Example: Watershed Delineation of the City of Santa Fe Water System. Yellow border indicates extent of the topographic boundary (Zone C). The urbanized portion of Santa Fe begins just left of the western most portion of the boundary (NMED-DWB, September 2003).

Refer to Appendix K for 3 –Letter PSOC Codes



Refer to Appendix K for 3 –Letter PSOC Codes

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.***

Agua Fria Well

Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Base Map	Secondary Highway	B	0-2	Low
Base Map	Secondary Highway	C	0-4	Low
Map Legend	NM Impaired Water	C	0-4	Low

Alto Well

Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Appendix K	MSL	A	1+	High
Appendix K	MSL	B	0-2	Low
Map Legend	NM Impaired Water	B	0-2	Low
Appendix K	CFB	C	0-4	Low
Appendix K	MSL	C	0-4	Low
Map Legend	NM Impaired Water	C	0-4	Low

Ferguson well

Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Map Legend	NM Impaired Water	A	1+	High
Appendix K	MSL	B	0-2	Low
Map Legend	NM Impaired Water	B	0-2	Low
Appendix K	CBS	C	0-4	Low
Appendix K	CHG	C	0-4	Low
Appendix K	MSL	C	0-4	Low
Base Map	Primary Highway	C	0-4	Low
Map Legend	NM Impaired Water	C	0-4	Low
Map Legend	Petroleum Storage	C	0-4	Low

Northwest WELL

Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
-	PSOC not Identified	-	-	Low

Osage well

Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Base Map	Secondary Highway	A	1+	High

Base map	Secondary Highway	B	0-2	Low
Map Legend	NM Impaired Water	B	0-2	Low
Base Map	Secondary Highway	C	0-4	Low
Map Legend	NM Impaired Water	C	0-4	Low

Santa Fe well

Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Base Map	Acequia	A	1+	High
Base Map	Acequia	B	0-2	Low
Map Legend	Monitoring Well	B	0-2	Low
Map Legend	Underground Injection Well	B	5-7	Moderate
APPENDIX K	CFA	C	0-4	Low
Appendix K	CFB	C	0-4	Low
Appendix K	CHG	C	0-4	Low
Appendix K	IPU	C	0-4	Low
Appendix K	IRG	C	0-4	Low
Appendix K	MMP	C	0-4	Low
Base Map	Acequia	C	0-4	Low
Base Map	Cemetery	C	0-4	Low
Map Legend	Monitoring Well	C	0-4	Low
Map Legend	Petroleum Storage	C	0-4	Low
Map Legend	Underground Injection Well	C	0-4	Low

Saint Michael's WELL

Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Base Map	Primary Highway	A	1+	High
Base Map	Railroad	A	1+	High
Map Legend	Hazardous & Solid Waste	A	1+	High
Appendix K	CAR	B	0-2	Low
Base Map	Primary Highway	B	0-2	Low
Base Map	Railroad	B	0-2	Low
Map Legend	Hazardous & Solid Waste	B	0-2	Low
Map Legend	Petroleum Storage	B	0-2	Low
Appendix K	CAR	C	0-4	Low
Appendix K	CPS	C	0-4	Low
Appendix K	CSS	C	0-4	Low
Base Map	Arroyo	C	0-4	Low
Base Map	Primary Highway	C	0-4	Low
Base Map	Railroad	C	0-4	Low
Map Legend	Hazardous/Solid Waste Fac.	C	0-4	Low
Map Legend	Petroleum Storage	C	0-4	Low

Torreon well

Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Map Legend	NM Impaired Water	A	1+	High
Map Legend	NM Impaired Water	B	0-2	Low
Appendix K	MSL	C	0-4	Low
Map Legend	NM Impaired Water	C	0-4	Low

Buckman well # 1				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Map Legend	NM Impaired Water	A	1+	High
Map Legend	NM Impaired Water	B	0-2	Low
Map Legend	NM Impaired Water	C	0-4	Low

Buckman well # 2				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Appendix K	IUR	B	0-2	Low
Appendix K	IUR	C	0-4	Low

Buckman well # 3				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Appendix K	IUR	C	0-4	Low

Buckman well # 3A				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Appendix K	IUR	C	0-4	Low

Buckman well # 4				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
-	PSOC not identified	-	-	Low

Buckman well # 5				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
-	PSOC not identified	-	-	Low

Buckman well # 6				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Appendix K	IUR	C	0-4	Low

Buckman well # 7				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Base Map	Arroyo	C	0-4	Low

Buckman well # 8				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
Appendix K	IUR	B	0-2	Low
Map Legend	NM Impaired Water	B	0-2	Low
Appendix K	IUR	C	0-4	Low
Map Legend	NM Impaired Water	C	0-4	Low

Nicholas Reservoir				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
-	PSOC Not Located-	-	-	Low

McClure Reservoir				
Map Reference	Description	Zone of Influence	Number of Type	Vulnerability Rank
-	PSOC Not Located-	-	-	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 FOR THE *CITY OF SANTA FE WATER SUPPLY SYSTEM*				
SOURCE NAME	**Sensitivity Rank**	**Vulnerability Rank**	**Susceptibility Rank**	**Operational Exceptions**	**Final Rank**
Agua Fria Well	Moderately low	Low	Low	-	Moderately Low
Alto Well	Moderately low	High	Moderately High	>3 PSOC	High
Ferguson Well	Moderately low	High	Moderately High	3 PSOC	High
Northwest Well	Low	High	Moderate	-	Moderate
Osage Well	Moderately low	High	Moderately High	-	Moderately High
Santa Fe Well	Moderately low	High	Moderately High	3 PSOC	High
St. Michaels Well	Moderately low	High	Moderately High	3 PSOC	High
Torreon Well	Moderately low	High	Moderately High	-	Moderately High
Buckman # 1	Moderately low	High	Moderately High	-	Moderately High
Buckman # 2	Moderately low	Low	Moderately Low	-	Moderately Low
Buckman # 3	Moderately low	Low	Moderately Low	-	Moderately Low
Buckman #3A	Low	Low	Low	-	Low
Buckman # 4	Moderately low	Low	Moderately Low	-	Moderately Low
Buckman # 5	Moderately low	Low	Moderately Low	-	Moderately Low
Buckman # 6	Moderately low	Low	Moderately Low	-	Moderately Low
Buckman # 7	Low	Low	Low	-	Low
Buckman # 8	Moderately low	Low	Moderately Low	-	Moderately Low
McClure Reservoir	Moderate	Low	Moderately Low	-	Moderately Low
Nichols Reservoir	Moderate	Low	Moderately Low	-	Moderately Low

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* susceptibility 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, CRY, 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

DRASTIC Index 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).

Equation for WRASTIC Index conservative value calculation:

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

- 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

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 = $D_R \times D_W + R_R \times R_W + A_R \times A_W + S_R \times S_W + T_R \times T_W + I_R \times I_W + C_R \times C_W$

- 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

(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.

WRASTIC Index[16] *Conservative Values* were used to complete the WRASTIC Index under the Sensitivity Analysis when adequate and/or complete information was not available (one or more conservative values may have been used):

Equation for WRASTIC Index conservative value calculation:

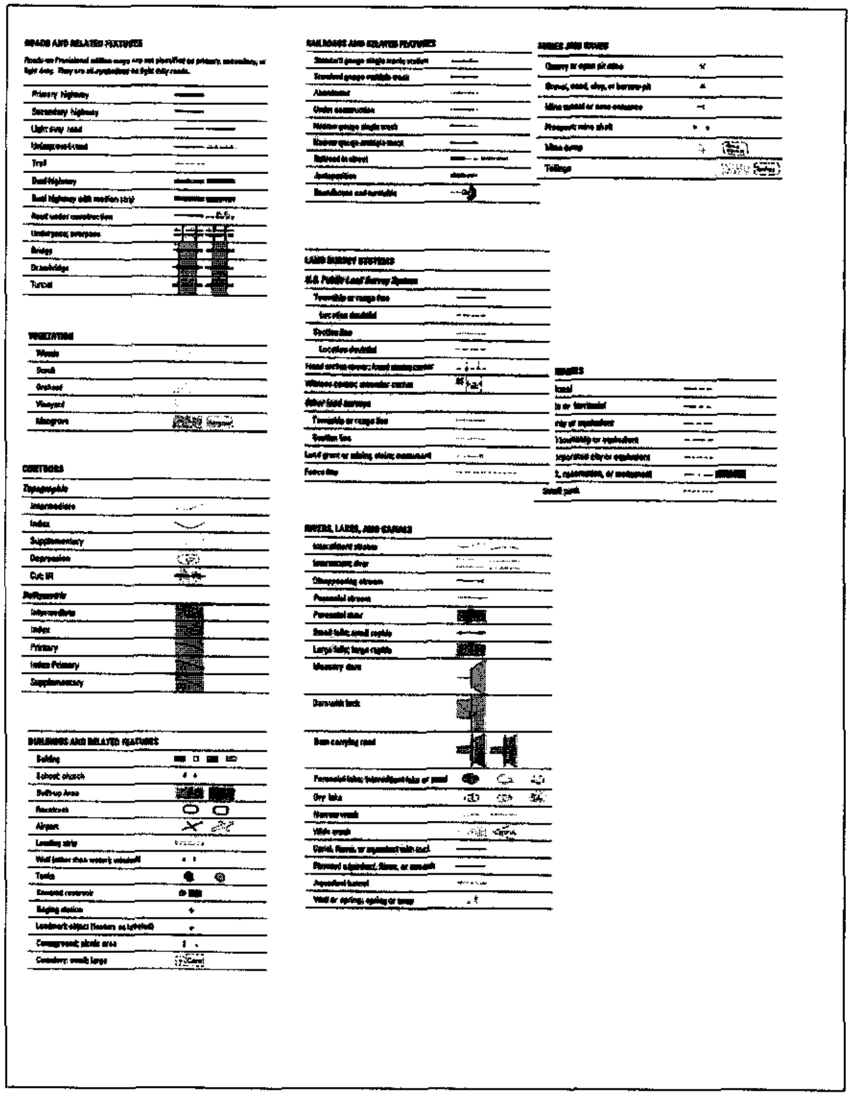
1. Where WRASTIC Index = $W_R \times W_W + R_R \times R_W + A_R \times A_W + S_R \times S_W + T_R \times T_W + I_R \times I_W + C_R \times C_W$

- W (Wastewater presence) – use 5 (5 x 3[weight])= 15
- R (Recreational impact) - use 5 (5 x 2[weight]) = 10
- A (Agricultural impact) – use 5 (5 x 2[weight]) = 10
- S (Size of the watershed) – use 5 (5 x 1[weight]) = 5
- T (Transportation Avenues) – use 5 (5 x 1[weight]) = 5
- I (Industrial impact) – use 8 (8 x 4[weight]) = 32
- C (vegetative Cover) – use 5 (5 x 1[weight]) = 5

(5x3) + (5x2) + (5x2) + (5x1) + (5x1) + (5x1) + (8x4) + (5x1) = **82**

[16] See State of New Mexico Source Water Assessment and Protection Program, February 2000, Appendix E WRASTIC Index.

APPENDIX N: *U.S. GEOLOGICAL SURVEY TOPOGRAPHIC MAP LEGEND*



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Appendix B

Consumer Confidence Reports

City of Santa Fe 2013 Water Quality Table

Regulated Compliance Monitoring

Contaminant	Units	MCL	MCLG	City Well Field[d]	Sample Year	Buckman Tank[e]	Sample Year	Canyon Road WTP	Sample Year	Buckman RWTP	Sample Year	Violation	Typical Source
Inorganic Contaminants													
Arsenic	ppb	10	0	4.8 (1.2 - 4.8)	2011	1.6	2011	ND	2013	ND	2013	No	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes
Barium	ppm	2	2	0.8 (0.24 - 0.8)	2011	0.072	2011	ND	2013	ND	2013	No	Discharge from drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Chromium	ppb	100	100	ND	2011	ND	2011	ND	2013	1	2013	No	Discharge from steel and pulp mills; erosion of natural deposits
Fluoride	ppm	4	4	[illegible] (0.10 - [illegible])	2011	[illegible]	2011	0.12	2013	[illegible]	2013	No	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
Selenium	ppb	50	50	4.7 (ND - 4.7)	2011	ND	2011	ND	2013	ND	2013	No	Discharge from petroleum and metal refineries; Discharge from plastic and fertilizer factories
Nitrate (as N)	ppm	10	10	7.9 (2.7 - 7.9)	2013	0.14	2013	ND	2013	0.15	2013	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion from natural deposits
Radioactive Contaminants (Compliance period 2011 to 2013)													
Gross Alpha Emitters	pCi/L	15	0	1.3 (1.2 - 1.3)	2013	0.1	2013	0.8	2011	0.8 (0 - 0.8)	2011	No	Erosion of natural deposits
Gross Beta/Photon Emitters	pCi/L	50[a]	NA	4.4 (1.1 - 4.4)	2013	2.1	2013	0.7	2011	3.3 (1.8 - 3.3)	2011	No	Decay of natural and man-made deposits
Radium 226/228	pCi/L	5	0	[illegible] (0.20 - [illegible])	2013	0	2013	0	2011	0.43 (0 - 0.43)	2011	No	Erosion of natural deposits
Uranium	ppb	30	0	2.0 (1.0 - 2.0)	2013	1.9	2013	ND	2011	1.0 (ND - 1.0)	2011	No	Erosion of natural deposits
Surface Water Contaminants													
Turbidity[c] (highest single measurement)	NTU	TT = 1.0	0	NA	NA	NA	NA	[illegible]	2013	[illegible]	2013	No	Soil Runoff
Turbidity[c] (lowest monthly % meeting limits)	NTU	TT = % <0.3 NTU	0	NA	NA	NA	NA	[illegible]%	2013	[illegible]%	2013	No	Soil Runoff
Total Organic Carbon (TOC)	NA	TT (45%-50% Removal)	NA	NA	NA	NA	NA	44% to 50% removal[b]	2013	NA	NA	No	Naturally present in the environment

Notes:
a. EPA considers 50 pCi/L to be the level of concern for beta particles.
b. Alternative compliance criteria used to meet TOC removal requirements.
c. Turbidity is a measure of the cloudiness of water. We monitor it because it is a good indicator of the effectiveness of our filtration system.
d. City wellfield: Alto, Agua Fria, Ferguson, Osage, Santa Fe, St. Michael's & Torreon.
e. Buckman Wells 1-13 and Northwest Well.

Key to Units, Terms and Abbreviations:
ppm: parts per million, or milligrams per liter (mg/L)
ppb: parts per billion, or micrograms per liter (µg/L)
pCi/L: picocuries per liter (a measure of radioactivity)
NA: Not Applicable
ND: Not Detected
NTU: Nephelometric Turbidity Units

TT: A Treatment Technique standard was set instead of an Maximum Contaminant Level

2013 Water Quality Report

City of Santa Fe Water Division, P.O. Box 909, Santa Fe, NM 87504

Customer Service (505) 955-4333
Administration (505) 955-4201

Map of Water Sources

Sources of Supply

Source Water Assessment and Availability

Do I need to take special precautions?

En Español

Why are there Contaminants in my Drinking Water?

Arsenic

Voluntary Monitoring

Cryptosporidium

Microbial and Disinfection Byproducts Rule

Contacts for Additional Information

Save Water Santa Fe

Copper and Lead Sampling

Important Drinking Water Definitions

2013 City of Santa Fe Water Quality Table

Asbestos

Voluntary Monitoring

Cryptosporidium

Asbestos

Lead and Copper

2014

City of Santa Fe

Water Quality Table

** AL = Action Level

City of Santa Fe 2014 Water Quality Table

Regulated Compliance Monitoring

Note:

c) Turbidity is a measure of the cloudiness of water. We monitor it because it is a good indicator of the effectiveness of our filtration system.

e) Buckman Wells (13) and Northwest Well.

Key to Units, Terms and Abbreviations

NA: Not Applicable.

ND: Not Detected.

NTU: Nephelometric Turbidity Units.

ppm: parts per million, or milligrams per liter (mg/L).

ppb: parts per billion, or micrograms per liter (µg/L).

pCi/L: picocuries per liter (a measure of radioactivity).

µg/L: Number of micrograms of substance per liter of water.

mg/L: Number of milligrams of substance per liter of water.

(Range): The range represents the highest and lowest values. Range values are not provided if only one sample was taken during the range period.

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water.

TT: Treatment Technique: a required process intended to reduce the level of a contaminant in drinking water.

AL: Action level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

2014 Water Quality Report

Map of Water Sources

Sources of Supply

Source Water Assessment and Availability

Do I need to take special precautions?

En Español

Lead and Copper Rule

Unregulated Contaminant Monitoring Rule (UCMR)

NAME	UNIT	REPORTED LEVELS*	RANGE LOW	RANGE HIGH
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

** AL = Action Level

2015 City of Santa Fe Water Quality Table

The table on the following page lists contaminants which:

1. have associated primary Maximum Contaminant Levels (MCLs) that are regulated and
2. were detected in testing conducted by the City and New Mexico Environment Department.

Microbial and Disinfection Byproducts Rule

Asbestos

Voluntary Monitoring

Cryptosporidium

City of Santa Fe 2015 Water Quality Table

Regulated Compliance Monitoring

Note:

a) [illegible]
b) Turbidity is a measure of the cloudiness of water. We monitor it because it is a good indicator of the effectiveness of our filtration system.
c) City wellfield: Alto, Agua Fria, Ferguson, Osage, Santa Fe, St. Michael's & Torreon.
d) Buckman Wells 1-13 and Northwest Well.

Key to Units, Terms and Abbreviations

N/A — Not Applicable.

ND — Not Detected.

NTU — nephelometric Turbidity Units.

ppm — parts per million, or milligrams per liter (mg/L).

ppb — parts per billion, or micrograms per liter (µg/L).

pCi/L — picocuries per liter (a measure of radioactivity).

2015 Water Quality Report

Map of Water Sources

Sources of Supply

Source Water Assessment and its Availability

En Español

Appendix C

NMED List of Potential Sources of Contamination

APPENDIX C: 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 Agrichemical 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
AHP	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 C: 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 C: 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 C: 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 C: 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 C: 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	Seepage, 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 D

Sensitivity Analysis

Sensitivity Questionaire for Water Systems

Well Construction Information

Name		Status	Drill Date	Improvements	Well Depth (feet)	Casing Depth	Casing Diameter (inches)	Casing Material	Casing Height above Ground Surface (feet)	Pump Depth (feet)	Most recent Non-Pumping Water Level (ft bgl)
City Well Field											
Agua Fria		active	1951		740	740	16	steel	n/a		238
Alto		active	1968		741	725	12.75	steel	n/a		156
Ferguson		active	1970		826	750	14	n/a	n/a		137
Osage		active	1971		809	770	n/a	n/a	n/a		69
Santa Fe		active	1951		1523	725	16	n/a	n/a		213
St. Michaels		active	1983		800	797	16	steel	24		217
Torreon		active	1997		1230	1230	16	steel	36		211
Other City Wells											
Acres Estates		not equipped									
Country Club Estates											
Hickox		not equipped									
North West		active	1998		2000	500	14.625	steel	n/a		408
Buckman Well Field											
Well 1	RG-20516-S-5	active	6-Aug-77		1097	1093	16	steel	n/a		216.3
Well 2	RG-20516-S-6	active	27-Jul-77		1593	1473	16	steel	n/a		51.88
Well 3	RG-20516-S		23-Jan-90	Originally drilled in th	1500	n/a	16	n/a	n/a		293.44
Well 3a			1995		1500	1490	1	steel	36		365
Well 4	RG-20516-S-2	active	10-Apr-72		1219	1219	16	steel	n/a		322.65
Well 5	RG-20516-S-3	active	25-May-72		1182	1182	16	steel	n/a		322.65
Well 6	RG-20516-S-4	active	23-Jun-72		1154	951	16	steel	12		320.34
Well 7	RG-20516-S-7	active	19-Jun-90		1415	700	16	steel	24		319.52
Well 8	RG-20516-S-8	active	10-Aug-90		910	380	16	steel	24		88.72
Well 9	RG-20516-S-9	active	12-Dec-02		1363		16/12				380.1
Well 10	RG-20516-S-10	active	23-Sep-03		2016		18/14				357.5
Well 11	RG-20516-S-11	active	24-Jul-03		2020		18/14				400.75
Well 12	RG-20516-S-12	active	7-Jul-03		1930		18/14				398.2
Well 13	RG-20516-S-13	active	16-Sep-03		2,018		18/14				317.35

Sensitivity Questionaire for Water Systems

Well Construction Information

Name		Status	Drill Date	Improvements	Well Depth (feet)	Date of Non Pumping Water Level	Most recent Non-Pumping Water Level (ft bgl)	Date of Non Pumping Water Level	2011 Pumping Rate (gpm)	Pump Rated Capacity (gpm)
City Well Field										
Agua Fria		active	1951		740	1994				840
Alto		active	1968		741	2003 SWAPP				250
Ferguson		active	1970		826	2003 SWAPP				270
Osage		active	1971		809	2003 SWAPP				500
Santa Fe		active	1951		1523	2003 SWAPP				220
St. Michaels		active	1983		800	2003 SWAPP				490
Torreon		active	1997		1230	2003 SWAPP				400
Other City Wells										
Acres Estates		not equipped								
Country Club Estates										
Hickox		not equipped								
North West		active	1998		2000	1998				960
Buckman Well Field										
Well 1	RG-20516-S-5	active	6-Aug-77		1097	2011	188.5	May 2015	1180	546
Well 2	RG-20516-S-6	active	27-Jul-77		1593	2011	107.12	May 2015	785	534
Well 3	RG-20516-S		23-Jan-90	Originally drilled in th	1500	2011	138.67	May 2015	500	n/a
Well 3a			1995		1500	2003 SWAPP				350
Well 4	RG-20516-S-2	active	10-Apr-72		1219	2011	73.65	May 2015	690	374
Well 5	RG-20516-S-3	active	25-May-72		1182	2011	154.51	May 2015	430	294
Well 6	RG-20516-S-4	active	23-Jun-72		1154	2011	136.45	May 2015	1110	766
Well 7	RG-20516-S-7	active	19-Jun-90		1415	2011	167.06	May 2015	1010	700
Well 8	RG-20516-S-8	active	10-Aug-90		910	2011	30.95	May 2015	660	530
Well 9	RG-20516-S-9	active	12-Dec-02		1363	2011	181.10	May 2015	415	
Well 10	RG-20516-S-10	active	23-Sep-03		2016	2011	334.97	May 2015	1040	
Well 11	RG-20516-S-11	active	24-Jul-03		2020	2011	396.41	May 2015	865	
Well 12	RG-20516-S-12	active	7-Jul-03		1930	2011	399.85	May 2015	810	
Well 13	RG-20516-S-13	active	16-Sep-03		2,018	2011	315.41	May 2015	1110	

Sensitivity Questionaire for Water Systems

Well Construction Information

Name		Status	Drill Date	Improvements	Well Depth (feet)	Pump Setting (ft)	Pump Type	Pump Size (HP)	Screen Material or Perforation Type	Depth to Top of Screen (ft bgl)	Depth to Bottom of Screen (ft bgl)
City Well Field											
Agua Fria		active	1951		740	400				201	740
Alto		active	1968		741	609				226	720
Ferguson		active	1970		826	610				175	746
Osage		active	1971		809	428				210	760
Santa Fe		active	1951		1523	550				200	725
St. Michaels		active	1983		800	714				382	782
Torreon		active	1997		1230	504				400	1200
Other City Wells											
Acres Estates		not equipped									
Country Club Estates											
Hickox		not equipped									
North West		active	1998		2000	760				500	2000
Buckman Well Field											
Well 1	RG-20516-S-5	active	6-Aug-77		1097	840				257	1093
Well 2	RG-20516-S-6	active	27-Jul-77		1593	680				234	1578
Well 3	RG-20516-S		23-Jan-90	Originally drilled in th	1500	n/a				500	1480
Well 3a			1995		1500	350				500	1490
Well 4	RG-20516-S-2	active	10-Apr-72		1219	750				454	1214
Well 5	RG-20516-S-3	active	25-May-72		1182	750				244	1170
Well 6	RG-20516-S-4	active	23-Jun-72		1154	730				291	1148
Well 7	RG-20516-S-7	active	19-Jun-90		1415	800				700	1400
Well 8	RG-20516-S-8	active	10-Aug-90		910	620				380	900
Well 9	RG-20516-S-9	active	12-Dec-02		1363					320	1320
Well 10	RG-20516-S-10	active	23-Sep-03		2016					500	1980
Well 11	RG-20516-S-11	active	24-Jul-03		2020					450	1980
Well 12	RG-20516-S-12	active	7-Jul-03		1930					400	1900
Well 13	RG-20516-S-13	active	16-Sep-03		2,018					400	1980

Sensitivity Questionaire for Water Systems

Well Construction Information

Name		Status	Drill Date	Improvements	Well Depth (feet)	Total Screen Length (ft)	Screen Diameter (inches)	Grouting/Sealing Materials	Grouting/Sealing Depth Interval (ft)
City Well Field									
Agua Fria		active	1951		740		n/a	n/a	n/a
Alto		active	1968		741		12.75	neat cement	52
Ferguson		active	1970		826		14	neat cement	50
Osage		active	1971		809		n/a	n/a	n/a
Santa Fe		active	1951		1523		n/a	n/a	n/a
St. Michaels		active	1983		800		n/a	neat cement	52
Torreon		active	1997		1230		16	neat cement	80
Other City Wells									
Acres Estates		not equipped							
Country Club Estates									
Hickox		not equipped							
North West		active	1998		2000		14.625	neat cement	40
Buckman Well Field									
Well 1	RG-20516-S-5	active	6-Aug-77		1097	375	n/a	neat cement	60
Well 2	RG-20516-S-6	active	27-Jul-77		1593	290	n/a	neat cement	80
Well 3	RG-20516-S		23-Jan-90	Originally drilled in th	1500	990	n/a	n/a	n/a
Well 3a			1995		1500		n/a	neat cement	143
Well 4	RG-20516-S-2	active	10-Apr-72		1219	215	n/a	neat cement	197
Well 5	RG-20516-S-3	active	25-May-72		1182	278	n/a	neat cement	197
Well 6	RG-20516-S-4	active	23-Jun-72		1154	287	n/a	neat cement	201
Well 7	RG-20516-S-7	active	19-Jun-90		1415	700	n/a	neat cement	99
Well 8	RG-20516-S-8	active	10-Aug-90		910	520	n/a	neat cement	99
Well 9	RG-20516-S-9	active	12-Dec-02		1363	1000			
Well 10	RG-20516-S-10	active	23-Sep-03		2016	1480			
Well 11	RG-20516-S-11	active	24-Jul-03		2020	1530			
Well 12	RG-20516-S-12	active	7-Jul-03		1930	1500			
Well 13	RG-20516-S-13	active	16-Sep-03		2,018	1580			

Sensitivity Questionaire for Water Systems

	Buckman Well Field													City Well Field						Other City Wells				
Well Integrity Information	1	2	3	4	5	6	7	8	9	10	11	12	13	Agua Fria	Alto	Ferguson	Osage	Santa Fe	St. Michaels	Torreon	Acres Estates	Country Club Estates	Hickox	North West
Is the well located outside of an area susceptible to flooding?	Y	Y	Y	Y	Y	Y	Y	Y						Y	Y	Y	Y	Y	Y	Y				Y
Does well casing terminate at least 12 inches above floor or ground level?	Y	Y	Y	Y	Y	Y	Y	Y						Y	Y	Y	Y	Y	Y	Y				Y
Is annular space pressure-grouted to depth of at least 20 feet?	Y	Y	Y	Y	Y	Y	Y	Y						N	Y	Y	N	N	Y	Y				Y
Is the wellhead properly sealed?	Y	Y	Y	Y	Y	Y	Y	Y						N	Y	Y	N	N	Y	Y				Y
Is there a concrete pad around the wellhead that slopes away from the casing?	Y	Y	Y	Y	Y	Y	Y	Y						Y	Y	Y	Y	Y	Y	Y				Y
Is the well vent screened and oriented to open downward or is cap vented?	Y	Y	Y	Y	Y	Y	Y	Y						Y	Y	Y	Y	Y	Y	Y				Y
Are the valves, pump controls, and meters properly maintained and operated?	Y	Y	Y	Y	Y	Y	Y	Y						Y	Y	Y	Y	Y	Y	Y				Y
Is the wellhead fenced, housed or properly protected?	Y	Y	Y	Y	Y	Y	Y	Y						Y	N	Y	Y	Y	Y	Y				Y
Were all issues identified in the latest Sanitation Survey resolved? If no issues, answer 'yes.'	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	N	N	N	N				Y

Y = "yes" and N = "no"

Drainage Basin Impacts on Raw Water Quality	Nichols	McClure
Surface area of reservoir (acres)	30.36 (max) 26 (avg)	87.63 (max)
Typical reservoir depth or range in depth (ft)	54.3 - 56.5	58.4 - 84.5
Average annual stream flow (cfs)	not available	0.998 - 5.616 (inflow)
Type (drop inlet, tower & gate, perforated pipe, etc.)	tower & gate	tower & gate
Construction material (concrete, steel, PVC, etc.)	concrete	concrete
Depth of intake or range of inlet depths (ft bgs or ft msl)	30 - 60	unknown
Site security	fencing; patrolled	fencing; patrolled
Typical duration of use (hours per day)	24 (seasonal)	24 (seasonal)
Method of discharge (pump or gravity flow)	gravity flow	gravity flow
Year installed or constructed	1972	1926 (original) 1949 (rebuilt)

Sensitivity Information - Integrity and Maintenance of Intake Structures

Integrity and Maintenance of Intake Structures	Nichols	McClure
Have regulatory deficiencies identified in the most recent sanitary survey been corrected? Answer "yes" if no deficiences.	Y	Y
Is telemetry or another form of monitoring provided that alerts the operator of an upstream spill or accident?	N	N
Can the intake be closed or adjusted by an operator during high runoff, reservoir turnover, or other events affecting water quality?	Y	Y
Does the water system maintain an emergency spill or upstream accident response plan?	Y	Y
Is access to the area immediately around the intake resistricted or controlled from recreational users, wildlife, livestock, etc.?	Y	Y
Is there an upstream reservoir, detention pond, wetland or other feature that intercepts or buffers nutrient and sediment loading to the intake?	Y	N
Is the conveyance between the intake and treatment facility lined, enclosed, or otherwise protected from contamination?	Y	Y
Are the intakes, screens and drain lines properly maintained and free of debris?	Y	Y

Note: Responses based on responses from City of Santa Fe utility staff

Drainage Basin Impacts on Raw Water Quality	Nichols	McClure
Does the daily average raw water turbidity regularly exceed 10 NTU? Answer "yes" if raw water quality not monitored.	N	N
Does the monthly raw water TOC regularly exceed 8.0 mg/L and is the raw water alkalinity less than 60 mg/L as CaCO3?	N	N
Is any reach of the water source upstream fron the intake listed as threatened or impaired under Section 303 (d) of the Clean Water Act?	N	N
Has urbanization, overgrazing, logging, wildfire, or other watershed phenomenon reduced or impacted riparian vegetation upstream from the intake?	N	N
Does the watershed consist of steep topography (slopes greater than 30%) and sparse vegetation (less than 20% coverage)?	N	N
Is the watershed response to storm events quick and intense (i.e. is the region upstream of the intake prone to flash flooding)?	Y	Y

Source Water Protection Area Watershed Impacts

Santa Fe River SWPA Watershed Impacts	Known impacts	Potential impacts	No impacts anticipated	Comments
Are there significant impacts to the river due to ... ?				
Wastewater			X	From the headwaters to the point of diversion to the CR WTP, the Santa Fe River watershed is in a forested area that is closed to the public. There is no development, industry or recreational use.
Recreation			X	
Agriculture			X	
Transportation			X	
Industry			X	

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.:	NM3505126	Federal Type:	C
Water System Name:	SANTA FE WATER SYSTEM (CITY OF)	Federal Source:	SW
Principal County Served:	SANTA FE	System Status:	A
Principal City Served:	SANTA FE	Activity Date:	06-01-1977

Expanded Sample Schedules / FANLs / Plans

Routine TCR Sample Schedules

Begin/End Date	Seasonal Period	Requirements
04-01-2005 - Continuous	1/1 - 12/31	80 RT/MN
01-01-1991 - 03-31-2005	1/1 - 12/31	70 RT/MN

RP TCR Schedules From To

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
05126000	04-01-2016 Continuous	5/1 5/31	04-01-2016	8 RT/QT	DBP2 - DBP STAGE 2
05126000	01-01-2008 Continuous	6/1 9/30	01-01-2008	30 RT/3Y	PBCU - LEAD AND COPPER
05126013	01-01-2015 Continuous		01-01-2015	1 RT/MN	TOCA - TOCA
05126030	01-02-2002 Continuous		01-01-2002	1 RT/3Y	HM - HEAVY METALS
05126030	01-01-2008 Continuous		01-01-2008	1 RT/9Y	NRAD - NEW RAD RULE
05126030	01-01-2020 Continuous		01-01-2020	2 RT/3Y	RSOC - REGULATED SOCS
05126030	01-01-2014 12-31-2019		01-01-2014	1 RT/3Y	RSOC - REGULATED SOCS
05126030	01-01-2002 Continuous		01-01-2002	1 RT/3Y	VOC1 - VOLATILE ORGANICS
05126031	01-01-2002 Continuous		01-01-2002	1 RT/3Y	HM - HEAVY METALS
05126031	01-01-2008 Continuous		01-01-2008	1 RT/6Y	NRAD - NEW RAD RULE
05126031	01-01-2014 12-31-2019		01-01-2014	1 RT/3Y	RSOC - REGULATED SOCS
05126031	01-01-2020 Continuous		01-01-2020	2 RT/3Y	RSOC - REGULATED SOCS
05126031	01-01-2002 Continuous		01-01-2002	1 RT/3Y	VOC1 - VOLATILE ORGANICS
05126033	01-01-2002 Continuous		01-01-2002	1 RT/3Y	HM - HEAVY METALS
05126033	01-01-2008 Continuous		01-01-2008	1 RT/6Y	NRAD - NEW RAD RULE
05126033	01-01-2014 12-31-2019		01-01-2014	1 RT/3Y	RSOC - REGULATED SOCS
05126033	01-01-2020 Continuous		01-01-2020	2 RT/3Y	RSOC - REGULATED SOCS
05126033	01-01-2002 Continuous		01-01-2002	1 RT/3Y	VOC1 - VOLATILE ORGANICS
05126034	01-01-2011 Continuous		01-01-2011	1 RT/3Y	HM - HEAVY METALS
05126034	01-01-2011 Continuous		01-01-2011	1 RT/6Y	NRAD - NEW RAD RULE
05126034	01-01-2011 12-31-2019		01-01-2011	1 RT/3Y	RSOC - REGULATED SOCS
05126034	01-01-2020		01-01-2020	2 RT/3Y	RSOC - REGULATED SOCS

	Continuous				
05126034	01-01-2011 Continuous		01-01-2011	1 RT/3Y	VOC1 - VOLATILE ORGANICS
05126035	01-01-2002 Continuous		01-01-2002	1 RT/3Y	HM - HEAVY METALS
05126035	01-01-2008 Continuous		01-01-2008	1 RT/6Y	NRAD - NEW RAD RULE
05126035	01-01-2008 12-31-2019		01-01-2008	1 RT/3Y	RSOC - REGULATED SOCS
05126035	01-01-2020 Continuous		01-01-2020	2 RT/3Y	RSOC - REGULATED SOCS
05126035	01-01-2011 Continuous		01-01-2011	1 RT/3Y	VOC1 - VOLATILE ORGANICS
05126038	01-01-2002 Continuous		01-01-2002	1 RT/3Y	HM - HEAVY METALS
05126038	01-01-2008 Continuous		01-01-2008	1 RT/3Y	NRAD - NEW RAD RULE
05126038	01-01-2020 Continuous		01-01-2020	2 RT/3Y	RSOC - REGULATED SOCS
05126038	01-01-2014 12-31-2019		01-01-2014	1 RT/3Y	RSOC - REGULATED SOCS
05126038	01-01-2002 Continuous		01-01-2002	1 RT/3Y	VOC1 - VOLATILE ORGANICS
05126040	01-01-2009 Continuous		01-01-2010	1 RT/YR	HM - HEAVY METALS
05126040	01-01-2008 Continuous		01-01-2008	1 RT/6Y	NRAD - NEW RAD RULE
05126040	01-01-2017 12-31-2019		01-01-2017	1 RT/3Y	RSOC - REGULATED SOCS
05126040	01-01-2020 Continuous		01-01-2020	2 RT/3Y	RSOC - REGULATED SOCS
05126040	01-01-2009 Continuous		01-01-2010	1 RT/YR	VOC1 - VOLATILE ORGANICS

Individual Non-TCR Sample Schedules

Facility	Begin End Date	Seas	Init MP Begin Dt	Req.	Analyte
	01-01-2011				
05126015	Continuous		01-01-2011	1 RT/MN	2920-CARBON, TOTAL
05126030	01-01-2002 Continuous		01-01-2002	1 RT/3Y	1024-CYANIDE
05126030	01-01-2002 Continuous		01-01-2002	1 RT/3Y	1025-FLUORIDE
05126030	04-01-2012 Continuous		01-01-2013	1 RT/YR	1038-NITRATE-NITRITE
05126031	01-01-2002 Continuous		01-01-2002	1 RT/3Y	1024-CYANIDE
05126031	01-01-2002 Continuous		01-01-2002	1 RT/3Y	1025-FLUORIDE
05126031	01-01-2007 Continuous		01-01-2007	1 RT/YR	1038-NITRATE-NITRITE
05126033	01-01-2002 Continuous		01-01-2002	1 RT/3Y	1024-CYANIDE
05126033	01-01-2002 Continuous		01-01-2002	1 RT/3Y	1025-FLUORIDE
05126033	01-01-2002 Continuous		01-01-2002	1 RT/YR	1038-NITRATE-NITRITE
05126034	01-01-2011 Continuous		01-01-2011	1 RT/3Y	1024-CYANIDE
05126034	01-01-2011 Continuous		01-01-2011	1 RT/3Y	1025-FLUORIDE
05126034	01-01-2015 Continuous		01-01-2015	1 RT/YR	1038-NITRATE-NITRITE
05126035	01-01-2002 Continuous		01-01-2002	1 RT/3Y	1024-CYANIDE
05126035	01-01-2002 Continuous		01-01-2002	1 RT/3Y	1025-FLUORIDE
05126035	01-01-2017 Continuous		01-01-2017	1 RT/QT	1038-NITRATE-NITRITE
05126038	01-01-2002 Continuous		01-01-2002	1 RT/3Y	1024-CYANIDE
05126038	01-01-2002 Continuous		01-01-2002	1 RT/3Y	1025-FLUORIDE
05126038	01-01-2002 Continuous		01-01-2002	1 RT/YR	1038-NITRATE-NITRITE
05126040	01-01-2009 Continuous		01-01-2010	1 RT/YR	1024-CYANIDE

05126040	01-01-2009 Continuous		01-01-2010	1 RT/YR	1025-FLUORIDE
05126040	01-01-2002 Continuous		01-01-2002	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
05126000	0999	MAX	4.0	MG/L	0	0	01-01-2002	Continuous	MRDL
05126000	0999	MIN	.001	MG/L	0	0	01-01-2005	Continuous	DSRD
05126015	0100	95P	0.3	NTU	31	6	02-01-2005	Continuous	95PT
05126015	0100	MAX	1	NTU	31	6	02-01-2005	Continuous	MAXT
05126015	0999	MIN	0.2	MG/L	31	24	01-01-2005	Continuous	EPRD
05126015	2920	MIN	1.0	RATIO	0	0	01-01-2011	Continuous	

Sample Plans

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

Appendix F

Public Information Flyer

This appendix will be included in the final report.

City of Santa Fe, NM
Utility Service Division
PO Box 909
Santa Fe NM 87504-0909

Service Period	Due Date	Account Number
-	08/04/2017	[redacted]
River Fund	**Amount Due**	**Amount Paid**
http://santafenm.gov/riverfund	$75.67	

Contribution to the Santa Fe River Fund will be used for projects that improve the flow in the Santa Fe River in ways that enhance the ecosystem of the river corridor and watershed.

Please make check payable to City of Santa Fe:

[redacted] 1

CITY OF SANTA FE NM
UTILITY SERVICE DIVISION
PO BOX 5439
SANTA FE NM 87502-5439

00000007567000[redacted]

EXHIBIT
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FREE WORKSHOP SERIES

IN CELEBRATION OF NATIVE SEED

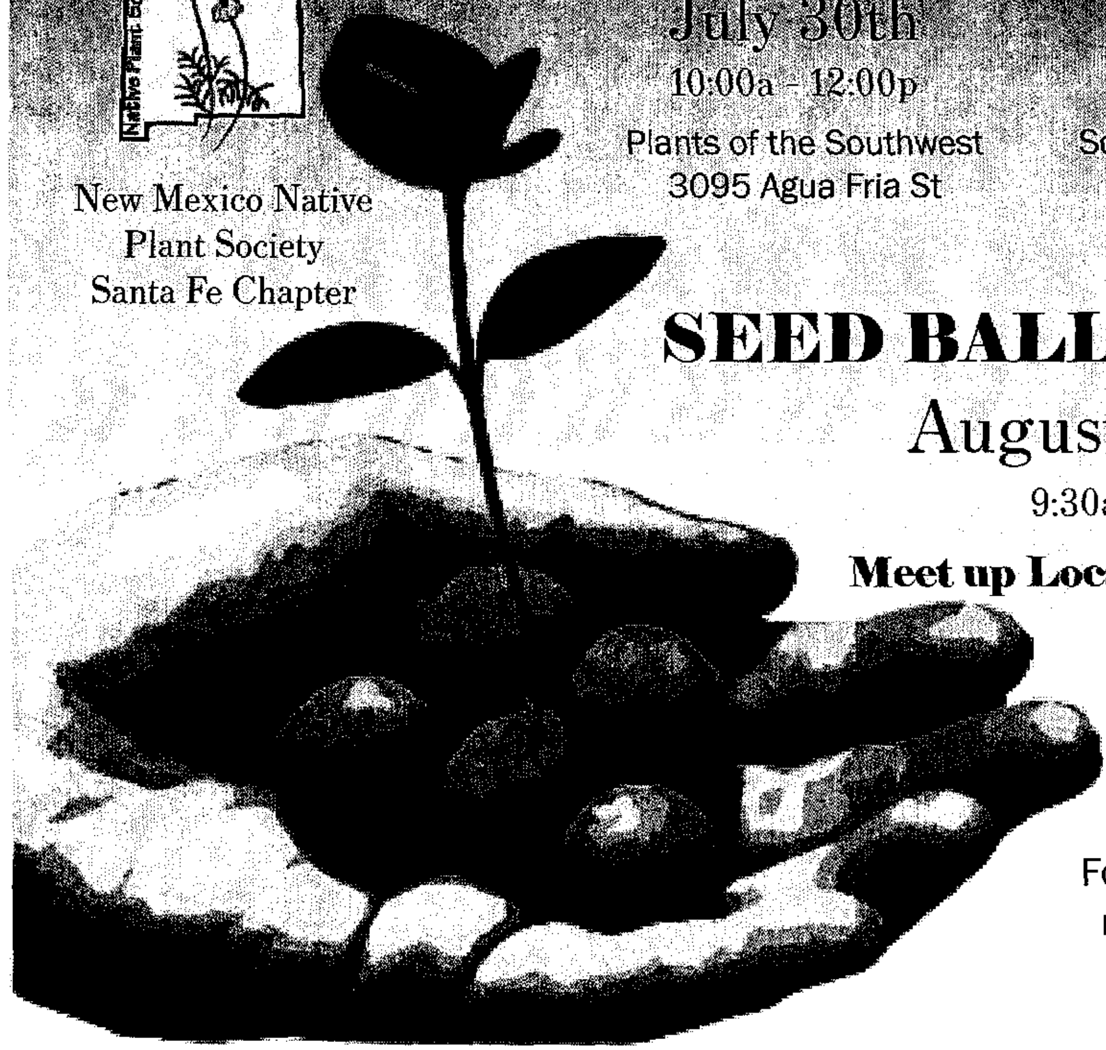
Bring your seedballs on August 19th in celebration of Native Plant Day

BIKERS AND WALKERS WELCOME

WORKSHOP DATES

July 30th
10:00a - 12:00p
Plants of the Southwest
3095 Agua Fria St

August 8th
3:00p - 5:00p
Southside Farmer's Market
6009 Jaguar Dr.



Native Plant Society of New Mexico

New Mexico Native Plant Society Santa Fe Chapter

SEED BALL THROW

August 19th

9:30a - 11a

Meet up Locations on both the

Southside & Northside

For location updates or more information visit www.npsnm.org or contact sara@appliedeco.org

SANTA FE FARMERS MARKET

SNaPP SANTA FE NATIVE PLANT PROJECT

CAN Creative Activist Netw

Santa Fe de San Francisco TRAILS AND ...SHED

PLANTS OF THE SOUTHWEST

EXHIBIT
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