Source Water Protection Plan

Buckman Direct Diversion

2023



Buckman Direct Diversion Source Water Protection Plan Public Water System # 3502826

COLLABORATORS



New Mexico Environment Department Drinking Water Bureau (NMED DWB) assisted greatly with this plan.



BDD staff reviewed and revised the BDD DRAFT Plan 2017.

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1. Introduction

The original source water protection plan (SWPP) was prepared by Daniel B. Stephens & Associates, Inc. (DBS&A) for the Buckman Direct Diversion (BDD) (Figure 1) under contract with the New Mexico Environment Department (NMED) Drinking Water Bureau (DWB) in 2017.

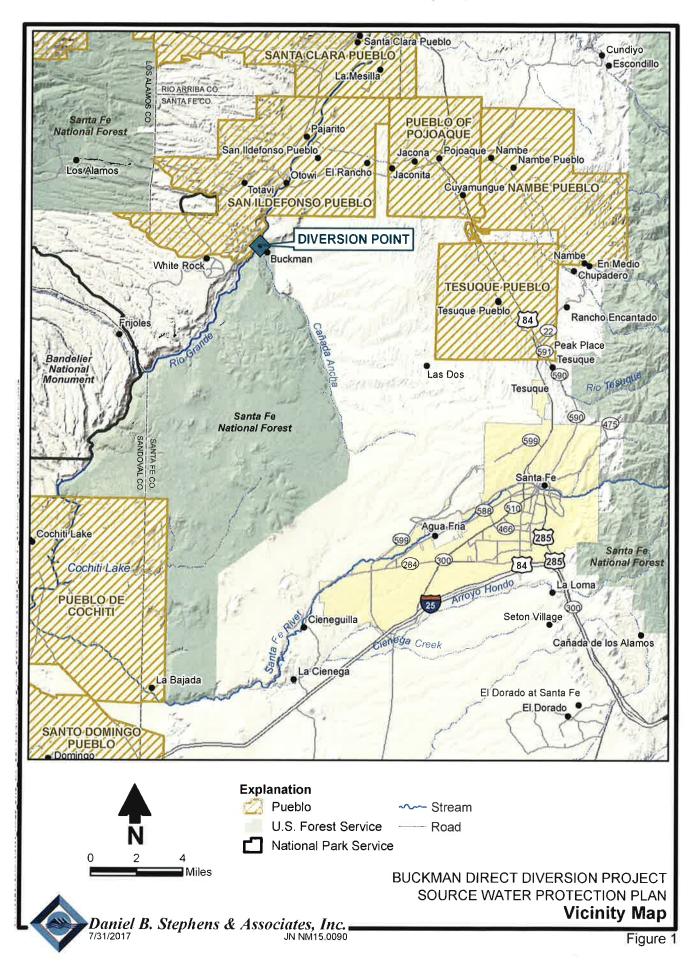
The NMED DWB assists communities in the protection of their drinking water systems through the Source Water Protection Program. By participating in this voluntary program, communities can assess a water system to identify and manage actual or potential sources of contamination to the drinking water supply. The program consists of a two-step process. The first step in the process is developing a SWPP by describing the area(s) to be protected, identifying actual and potential contamination sources, and evaluating the risk each source of contamination poses to the drinking water source area.

The second step of the process is implementing the developed SWPP. The SWPP benefits the public water system by providing management and implementation strategies to ensure the protection of the drinking water supply. Preventing contamination is much easier and less expensive than cleaning up a contaminated source or finding a new source.

The original (2017) SWPP for the BDD was developed using the *New Mexico Source Water and Wellhead Protection Toolkit* (NMED DWB, 2013). That SWPP was updated by BDD staff using a revised risk assessment approach in order to produce the 2023 version. 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 BDD's Source Water Protection Area.

This document identifies actual and potential sources of contamination to BDD's water sources and makes an action plan for preventing future contamination. BDD Board and the BDD Source Water Protection Team are responsible for implementing the SWPP and updating the plan on a regular basis.

Figure 1. BDD and Vicinity Map



1.1 Purpose

The Source Water Protection Plan (SWPP) is a tool for BDD to ensure clean and high-quality drinking water sources for current and future generations. This Source Water Protection Plan is designed to:

- Create an awareness of the community's drinking water sources and the potential risks to surface water and/or groundwater quality within the watershed;
- Encourage education and voluntary solutions to alleviate pollution risks;
- Promote management practices to protect and enhance the drinking water supply; and
- Provide for a comprehensive action plan in case of an emergency that threatens or disrupts the community water supply.

Developing and implementing source water protection measures at the local level (i.e. county and municipal) will complement existing regulatory protection measures implemented at the state and federal governmental levels by filling protection gaps that can only be addressed at the local level.

1.2 Source Water Protection Program Background

The 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.

1.3 Components of a Source Water Protection Program

The primary objective of a source water protection program is to safeguard and improve source water quality for current and future use. A program may include several fundamental components, such as:

- An inventory and characterization of the contaminant threads in the source water protection area;
- An action plan outlining strategies and resources required for the long-term management of the source to prevent contamination; and
- Implementation of the management measures identified in the planning process.

When developing a program, partners should account for a variety of factors such as local environmental conditions, the needs and capacity of water providers, stakeholder interests, and other site-specific factors. See Figure 2.

Figure 2. Phases in development and implementation of SWPP https://www.epa.gov/sourcewaterprotection/assess-plan-and-protect-source-water#components



1.4 Assessment Phase

1.4.1 Step 1 - Delineate the source water protection area (SWPA).

A source water protection plan includes a delineated area that shows the area to be assessed and protected based on where the public water system draws drinking water supplies.

1.4.2 Step 2 – Inventory known and potential sources of contamination (PSOC).

A contaminant source inventory lists all documented and potential contaminant sources or activities of concern within the SWPA that may pose a threat to drinking water supplies.

1.4.3 Step 3 – Determine the susceptibility of the public water system to contaminant sources or activities within the SWPA.

Determining the susceptibility of the public water system to threats included on the contaminant source inventory list is an important step for connecting the nature and severity of the threat to the likelihood of the threat contaminating source water.

1.4.4 Step 4 – Engage the public about threats identified in the assessment.

Effective source water protection programs ensure that the public has the information necessary to act to prevent contamination. Early involvement in the planning process helps build consensus on the need for action, leading to more comprehensive source water protection.

1.5 Protection Phase

1.5.1 Step 5 - Develop an action plan to identify and prioritize specific implementation activities.

Communities can use the information gathered from the source water assessment process to develop action plans identifying long-term management strategies for preventing contamination of sources of drinking water.

1.5.2 Step 6 – Protect source of drinking water by implementing protective actions.

Communities use many different source water protection practices to prevent contamination of their drinking water supplies. These measures can be tailored to address each threat or an array of risks specific to each public water system.

1.5.3 Step 7 – Evaluate and update action plan periodically.

Plans should be evaluated and, if necessary, revised in response to new information, such as changes to the watershed or source water protection area or other factors that could affect the relevance and efficacy of the plan.

1.6 Revisions

1.6.1 Revision 2019

In 2019 BDD revised the original SWPP dated October 2017. The revision of February 2019 included revising the Source Water Protection Team members, updating the BDD production rates for 2017 and 2018 and the corresponding tables and graphs, updating the Santa Fe County per capita daily use for 2017 and its corresponding table and graph, and selecting the BDD Actions Items.

1.6.2 Revision 2023

In 2023 BDD revised a few sections of the 2019 SWPP including Section 4.2 and the risk assessment of the PSOCs in Section 7. A search of the NMED database of PSOCs revealed the same PSOCs present in 2017.

2. Source Water Protection Team

The Source Water Protection Team has the responsibility for input to the SWPP and also for the implementation of the recommended action items in the SWPP. The BDD serves Santa Fe County (the County), the City of Santa Fe (the City), and Las Campanas, and members from each of these entities are represented on the Source Water Protection Team. Members of the Source Water Protection Team are identified in Table 1.

Table 1. Source Water Protection Team

Name	Affiliation	E-mail
Rick Carpenter	Buckman Direct Diversion	rrcarpenter@santafenm.gov
Randy Sugrue	Buckman Direct Diversion	rcsugrue@santafenm.gov
Danny Carter	Buckman Direct Diversion	djcarter@santafenm.gov
Jill Turner	New Mexico Environment Department	jill.turner@state.nm.us
Alan Hook	City of Santa Fe	aghook@santafenm.gov
Melissa McDonald	City of Santa Fe	mamcdonald@santafenm.gov
Michelle Hunter	County of Santa Fe	mghunter@santafecountynm.gov
Tom Egelhoff	Las Campanas	tegelhoff@clublc.com

3. WATER SYSTEM INFORMATION

BDD is jointly owned by the City and the County of Santa Fe, with Las Campanas as a limited partner. By agreement between the City and County, the City currently provides financial and administrative support.

The BDD is governed by the BDD Board, established in 2005 by the Joint Powers Agreement. According to the agreement, "[g]overnance will be through a five member board consisting of two County Commissioners and two City Councilors and a qualified person (to serve a one year term but without term limits) appointed by a majority of the four elected officials." The board also includes a non-voting member that represents Las Campanas.

The BDD Board's powers include:

- The authority to enter into a contract with an entity to maintain and operate the BDD. The current contract to maintain and operate the BDD is with the City of Santa Fe.
- The authority to enter into a contract with an entity to act as the fiscal agent the BDD. The City of Santa Fe is currently contracted with the BDD to serve as the BDD's fiscal agent. The fiscal agent must receive the BDD Board's approval for expenditures over an amount specified in the contract.
- Entering into a Facility Operations and Procedures Agreement with Las Campanas.

The BDD Board's authority and duties do not encompass:

- The distribution of water to customers;
- The assessment or collection of water charges;
- The regulation of water use by customers or the ownership;
- Acquisition or permitting of use of water rights or contract rights.

The BDD diverts water from the Rio Grande for use by its customers. The water is ultimately derived from two sources:

★ San Juan-Chama (SJC) Project water. This is water that is artificially transferred
from the Colorado River basin to the Rio Grande basin. The rights to this water
are primarily regulated by the U.S. Bureau of Reclamation (BOR), and

Native Rio Grande water. This is water that naturally occurs in the Rio Grande watershed. The rights to this water are primarily regulated by the New Mexico Office of the State Engineer (OSE).

BDD began supplying water to its customers in 2011. The BDD's customers and BDD water system are discussed in more detail in Sections 3.2 and 3.3, respectively.

3.1 San Juan-Chama Project

The SJC Project is a U.S. Bureau of Reclamation (BOR) trans-basin transfer project and makes New Mexico's 11 percent allocation of Colorado River Basin water available to users in the northcentral 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 streamflow exceeds the minimum allowable amount, and total diversions cannot exceed 1,350,000 acre-feet in any 10-year period. The average annual yield is 96,200 acre-feet per year (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 4 years supply for its designated downstream contractors (Table 2). 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). Rio Grande water used by the City and County of Santa Fe under the SJC Project is diverted at the BDD and treated at the Buckman Regional Water Treatment Plant (BRWTP). Appendix A shows how water is transferred from Colorado into Heron Reservoir and into the Rio Grande.

Table 2. Contractors of San Juan-Chama Project Water

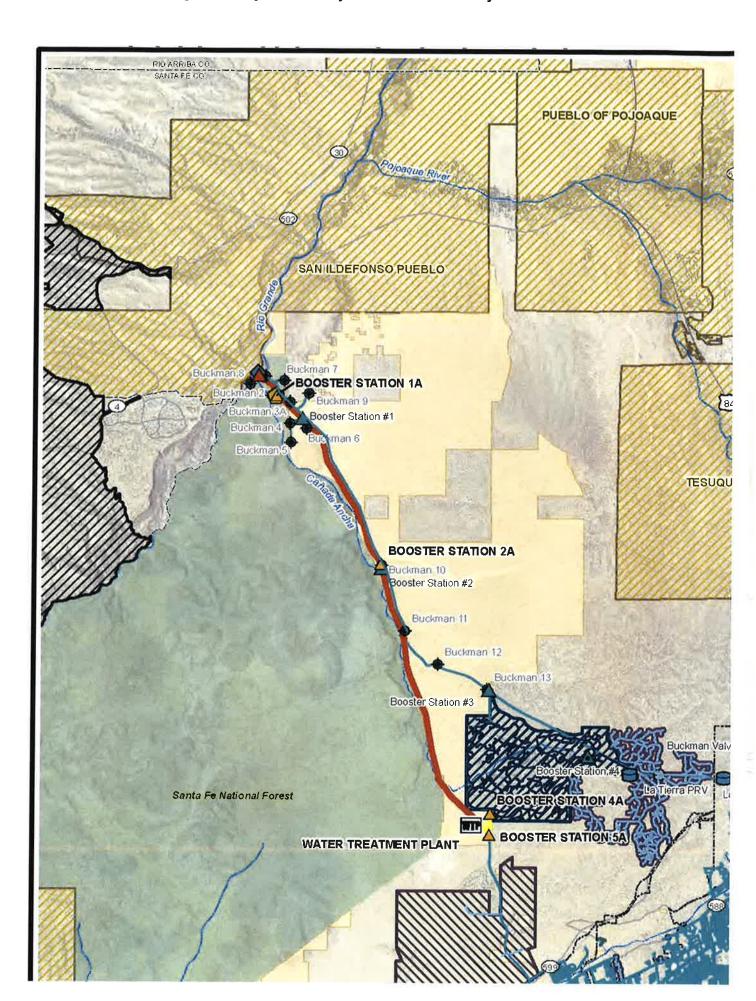
Contractor	SJC Allocation (ac-ft/yr*)										
Municipal											
Albuquerque	48,200										
City of Santa Fe	5,230										
Santa Fe County	375										
Los Alamos	1,200										

Contractor	SJC Allocation (ac-ft/yr*)
Los Lunas	400
Twining Water and Sanitation District	15
Española	1,000
Taos	400
Belen	500
Bernalillo	400
Jicarilla Apache Nation	6,500
Ohkay Owingeh 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

^{*}ac-ft/yr = acre-feet per year

In 1976, the City, the Public Service Company of New Mexico (PNM) (which owned and operated the Santa Fe public water system at the time), and the County signed a 40-year contract with the BOR. The contract allotted 5,230 ac-ft/yr of SJC Project water to the City and 375 ac-ft/yr to the County, 5,605 ac-ft/yr total. In 2006, two permanent but separate contracts were signed between BOR and the City and County of Santa Fe for the same allocations of water.

Figure 3. City and County of Santa Fe Water System



3.2 BDD Customers

BDD has three customers: the City of Santa Fe, the County of Santa Fe, and Las Campanas. BDD's total annual allocations are 8,730 ac-ft/yr of which large percent belongs to the City of Santa Fe.

3.2.1 City of Santa Fe

The City of Santa Fe water system serves approximately 78,200 customers through 33,297 metered connections. The bulk of these customers are within the City limits. In total, the City of Santa Fe system serves a population of 90,810, making it the fourth-largest system in New Mexico. (Hook, 2021)

Also, the City has several water service agreements to serve customers within Santa Fe County. The City of Santa Fe Water System is unique among public water systems in the Southwest due to its diverse portfolio of source waters, including two groundwater well fields, surface water from the Santa Fe River stored in two reservoirs, and surface water from the San Juan-Chama Project obtained from the Rio Grande at the Buckman Direct Diversion. The City purchases water from the latter, a separate public water system. See (Hook, 2021).

- Surface water from the Santa Fe River stored in two reservoirs.
- Surface water from the Rio Grande River from Buckman Direct Diversion, and
- Groundwater from the Tesuque Formation at
 - City Well Field (CWF), and
 - Buckman Well Field (BWF).

From 2013 to 2019, the approximate average contributions of Santa Fe River surface water, Rio Grande surface water, and ground water were 35%, 45%, and 20%, respectively. However, as much as 80% of the City's water is derived from BDD at certain times of the year. The 2013-2019 average annual production by the City of Santa Fe Water System from all sources was 8,600 ac-ft.

3.2.2 Santa Fe County

The Santa Fe County water system is divided into two sectors, West and South, and serves approximately 3,500 accounts. The County's consumer confidence reports (CCRs) (https://www.santafecountynm.gov/public works/utilities) describe the sectors as follows:

The West Sector supplies potable water to users outside of the western boundary of the City of Santa Fe and within the boundary of the Historic Village of Agua Fria. These users are located in the areas of: Las Campanas Estates I & II, Aldea, Tessera, El Prado, La Serena, Los Sueños, Sonrisa, Northwest Ranches, and Vista Aurora Subdivisión. Water is also provided to the Las Campanas Water and Sewer Cooperative and to the Agua Fria Community Water System.

The South Sector supplies potable water to users outside of the boundary of the City of Santa Fe in the areas including Campo Conejos, Turquoise Trail South, Rancho Viejo, Oshara Village, La Pradera, Valle Vista, the County Public Safety Complex, Turquoise Trail School, Las Lagunitas, and parts of La Cienega. Water is also provided to other systems, including the New Mexico National Guard, the New Mexico State Penitentiary, and the La Cienega Mutual Domestic Water Consumers Association.

The 2010 Census estimated that there were 6,992 housing units in the County water system, with an average household size of 2.52, giving a population of 17,620 served by the County water system. The Census estimated that 6,104 of these houses were occupied (888 were not), with a vacancy rate of 12.7 percent.

In addition to BDD, the County relies on the City of Santa Fe's water sources. The County uses much of the City's water system infrastructure, although the County also owns and maintains its own storage tank, booster station, and pipelines (Figure 3).

The 2017 County's system-wide average daily demand (ADD) was 833,365 gallons of which the residential 2017 ADD was 529,904 gallons. Figure 4 shows the County's per capita daily use from 2010 to 2017. The system-wide per capita daily use during this period ranged from 62 to 140 gallons per capita per day (gpcd) (Table 3), with an average of 86 gpcd.

Table 3. Santa Fe County Per Capita Daily Use, 2010-2017

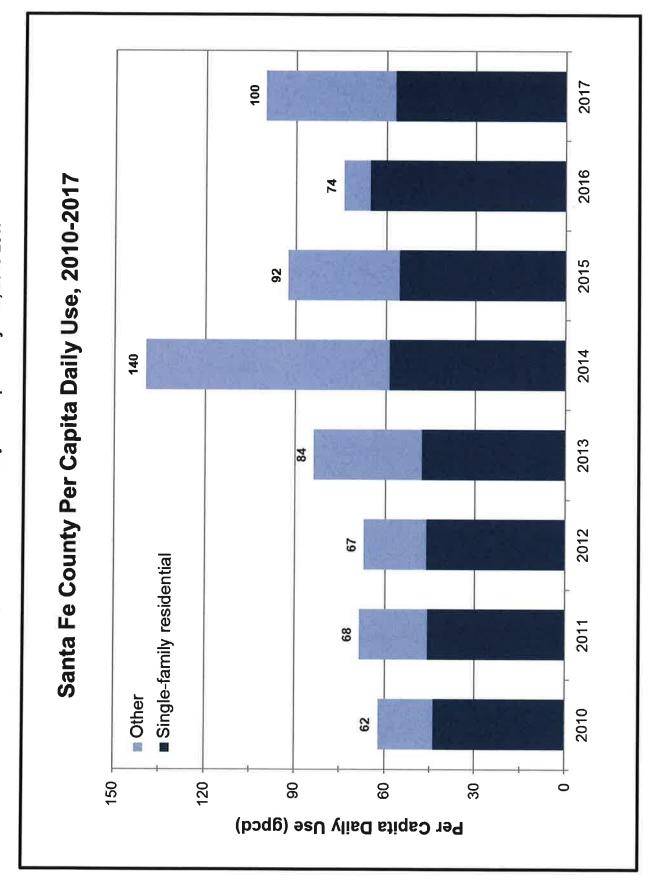
Year	Per Capita Daily Use (gpcd*)
2010	62
2011	68
2012	67
2013	84
2014	140
2015	92
2016	74
2017	100
Average	86

^{*}gpcd = Gallons per capita per day

In the future, the County's water system commitments will be expanding in accordance with the Aamodt Settlement. The following excerpts from *Water Matters!* (2015) provide a brief overview of this case:

The "Aamodt case" is a complex, long-running adjudication of water rights in the Pojoaque River watershed northwest of Santa Fe. In 1966, it was filed in federal court as State of New Mexico, ex rel. State Engineer, et al. v. Aamodt, et al. The parties include the State, through the State Engineer, about 5,600 non-Indian claimants, the Pueblos of Nambé, Pojoaque, San Ildefonso, and Tesuque, and governmental entities such as the county of Santa Fe, many acequias, the Pojoaque Valley Irrigation District, and several federal and state agencies. The rights being adjudicated include, but are not limited to, State water rights of non-Indians and government agencies for irrigation, domestic and commercial uses as well as the federal water rights of the Pueblos to historic, present, and future uses.

Figure 4. Santa Fe County Per Capita Daily Use, 2010-2017



[Aamodt Settlement highlights continues]

The Aamodt settling parties, seven governmental entities, including the state, and representatives from the non-Indian community, began negotiations in 2000. By 2004, a settlement was drafted and presented to the public. The settlement featured a regional water supply system for both Pueblos and non-Indians. In this first version of the settlement, all non-Indians had to hook up to the water system. After review and public discussion, the settling parties returned to the table to address non-Indian communities' concerns and to remove the mandatory provision for water-system hookup. The State of New Mexico, Santa Fe County, City of Santa Fe, representatives from non-Indian communities, and the four Pueblos signed the 2006 Settlement Agreement and sent it to Congress. For more information about the settlement process, please see the chapter "American Indian Water Right Settlements" in this edition of Water Matters!.

In the spring of 2010, the Stell Ombudsman Program conducted eleven public meetings for the County of Santa Fe to explain the settlement agreement. In December of 2010, Congress passed the Claims Resolution Act, which approved the Aamodt and other settlements, and the President signed it into law. The parties then adjusted the 2006 Settlement Agreement to conform to the Act, and in March of 2013, the agreement was formally signed by the Secretary of the Interior, Pueblo leaders, and state officials. In the early months of 2014, the Stell Ombudsman Program held thirty public meetings and office hours for the county of Santa Fe to explain the settlement agreement. Other interests also held public meetings.

The key provisions of the Aamodt settlement include:

- constructing a regional water system;
- providing non-Indians with a choice of whether to join the settlement, and upon joining, a choice of whether to hook up to the regional water system:
- relinquishing existing Pueblo claims against non-Indians who join the settlement;
- closing the basin to new water right development following the entry of a Pueblo final decree by the court;
- metering all water uses in the basin;
- limiting Pueblo water use; and
- · protecting existing uses.

The Regional Water System is a pipeline and water-distribution system which will have capacity to deliver water from the Rio Grande to the four Pueblos and to non-Indian residents. The system provides 2,500 acre-feet per year for Pueblo consumptive use. Santa Fe County is allowed to "piggy back" on the system with an extension to serve non-Pueblo domestic well owners who choose to connect and all future water development. The county portion of the system will accommodate up

to 1,500 acre feet per year. Water for the regional water system will be diverted from the Rio Grande through infiltration well structures along the river banks on San Ildefonso Pueblo land above Otowi gage. This project is separate from Santa Fe's Buckman Diversion Project. The Bureau of Reclamation will build the system.

Prior to the passage of the Aamodt Litigation Settlement Act, the cost estimate for the settlement in 2006 dollars was \$177.3 million (\$106.4 million for the federal contribution, \$49.5 million for the state contribution, and \$21.4 million for the county's contribution). This cost estimate is indexed to accommodate economic changes. The majority of the funding is for the construction of the regional water system and for the acquisition of water rights for the Pueblos. In the Claims Resolution Act, Congress appropriated \$81.8 million of the federal contribution and authorized an additional \$92.5 million.

3.2.3 Las Campanas

BDD has two customers from the Las Campanas community: Las Campanas Water and Sewer Cooperative (the Co-op) and the Club at Las Campanas (the Club).

3.2.3.1 Las Campanas Water and Sewer Cooperative

The Co-op provides treated drinking water for domestic use in Las Campanas and serves 656 water connections — an estimated population of 1,500 people (656 connections x 2.3 people per household). In 2016, the Co-op's ADD was 236,921 gallons, with a peak daily demand of 498,379 gallons.

Finished treated water travels via gravity flow from the City's 10 million-gallon storage tank to the Co-op's receiving station, where it is treated with sodium hypochlorite. The Co-op owns and maintains two underground storage tanks (0.75 million-gallon and 0.5 million-gallon) and 45 miles of pipeline, sized 4 to 18 inches, distributed among four pressure zones.

Table 4 shows the monthly water flow into the Las Campanas receiving station for the period of 2011 to 2016.

Table 4. Water Flow at Las Campanas Co-op Receiving Station, 2011-2016

Month	Marie V	F	low (mill	ion gallo	ns)	
WOITH	2011	2012	2013	2014	2015	2016
January	2.5	1.9	2.4	2.4	1.9	2.0
February	2.5	1.4	1.6	2.1	1.4	1.8
March	1.7	2.5	2.4	2.5	2.2	2.7
April	6.7	5.0	5.3	5.6	4.2	4.8
Мау	9.7	9.7	10.2	8.9	7.5	9.2
June	11.9	11.2	12.7	10.9	10.4	12.0
July	13.0	11.0	13.0	11.0	9.7	14.5
August	11.2	11.5	11.5	10.2	10.8	10.2
September	8.6	9.6	8.4	9.6	10.3	12.4
October	5.5	7.0	5.7	7.1	6.9	11.5
November	2.0	2.3	2.2	2.5	1.9	3.3
December	2.0	2.6	2.3	2.3	2.2	2.1
Total Annual	77.3	75.6	77.9	75.0	69.5	86.5

3.2.3.2 The Club at Las Campanas

The Club has two 18-hole golf courses and a driving range that make up a total of 140 acres of irrigated turf grass. On average, from 2010 to 2016, the Club has applied just shy of 600 acre-feet (200 million gallons) of raw (untreated) water per year to maintain the turf grass. The water used for irrigation is a combination of treated effluent from the Co-op and untreated, raw water diverted from the Rio Grande by the BDD. Table 5 shows the Club's monthly raw water usage from 2010 to 2021.

The Club derives its water rights to water diverted from the Rio Grande from several sources:

- The Club has access to around 250 ac-ft/yr of native Rio Grande raw (untreated) water purchased through the Las Campanas and Sewer Water Co-op.
- The Club leases 600 ac-ft/yr of SJC water from the Jicarilla Apache Tribe.
- The Club has a contract with the County for up to 600 ac-ft/yr of native Rio Grande water.

In addition, the city has occasionally supplied the Club with water from the city's Buckman wells during emergencies.

Table 5. Water Usage by the Club at Las Campanas, 2010-2016

Month	(- 17.			rrigation	Water	Use (mill	lion gall	ons)	100	Later 7		- C W
WOTU	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average
January	0.3	0.8	0.6	0.1	3.0	0.0	0.0	0.0	1.6	1.6	3.6	0.0	1.0
February	0.0	1.1	1.2	2.7	5.1	0.3	1.3	1.1	4.2	1.6	0.0	0.0	1.5
March	0.7	9.2	10.6	6.9	9.2	11.7	18.9	14.4	13.2	0.0	1.7	0.0	8.0
April	12.2	20.9	18.9	23.7	25.8	22.9	17.9	20.6	32.3	16.3	20.4	13.5	20.4
May	25.3	29.6	32.6	31.2	29.4	22.8	29.0	24.7	36.2	33.9	41.3	20.0	29.7
June	35.0	41.2	40.6	43.3	36.1	35.6	36.9	39.4	44.1	38.3	38.9	22.4	37.7
July	19.2	38.3	27.8	29.5	29.8	19.6	33.0	37.1	28.7	33.5	35.6	14.4	28.9
August	21.8	22.1	26.9	22.5	23.7	26.7	13.9	25.6	20.1	27.2	28.5	14.1	22.8
September	23.6	18.2	21.0	15.7	21.3	22.1	20.3	19.8	17.8	27.6	24.2	9.0	20.1
October	11.2	11.4	17,9	15.3	16.0	14.6	22.1	0.0	11,1	18.0	17.0	5.4	13.3
November	3.1	4.6	5.1	3.7	6.7	5.4	3.4	14.2	1.8	0.6	0.0	0.2	4.1
December	1.6	0.1	0.0	0.6	1.2	0.5	0.9	0.0	0.0	0.0	0.0	0.0	0.4
otal Annual	154.1	197.6	203.1	195.3	207.0	182.2	197.6	196.7	211.0	198.6	211.2	99.0	187.8

The Club has one booster station (BS2A), three irrigation system pump-houses, two transfer pump stations, and five holding ponds. The holding ponds provide approximately 100 acre-feet of combined water storage capacity. Approximately 10 miles of 12-inch pipelines connect BS2A to the holding ponds. Watering requirements for the turf grass are determined by three on-site weather stations.

3.3 BDD Water System

The intake for the BDD system is located on the east bank of the Rio Grande in the historic ghost town of Buckman, approximately 3.5 miles downstream of the Otowi Bridge. The U.S. Forest Service owns the land at the BDD intake. The surrounding area is a mix of Bureau of Land Management (BLM), San Ildefonso Pueblo, and private land (Figure 3). One lift station and two booster stations pump the raw water uphill approximately 1,100 feet in altitude and 11 miles in length via a 30-inch pipeline from the river to the BRWTP. The BRWTP is an advanced treatment facility. As shown in Appendix A, BDD applies the following water treatment processes (BDD, 2017):

- River water is diverted through a riverside structure with fish screens. Larger sand particles are separated from the pumped raw water and returned to the Rio Grande. The remaining raw water is pumped to the BRWTP.
- At BRTWP, raw water passes through three pre-sedimentation basins which allow remaining larger particles to settle to the bottom of the basins via gravity.
- After the pre-sedimentation basins, water is mixed with a coagulant (ferric chloride) which causes even the finest particles to clump together. Ozone is added to oxidize organic material and improve the coagulation process.
- Next, flocculation is achieved through gentle mixing. The tiny individual particles collide, stick together, and become larger and heavier. Contaminants and impurities are swept up and removed with the flocculated particles.
- ♣ Plate settlers are used to provide very still conditions to separate by gravity the heavier floc particles from the water. The settled solids from this process are concentrated and dewatered in a centrifuge, and then disposed of appropriately.
- After the plate settling the clarified water is filtered under low pressure through membranes with small pore size. This membrane filtration removes all of the particulate matter larger than 0.1 micrometer.
- Ozone is applied once again to the clean water. It oxidizes dissolved organic material not previously removed and kills microbes. Residual ozone is then destroyed.
- The water passes through granular activated carbon (GAC) contactors. The oxidized organics are removed by the biologically active carbon, which also works as a "polishing" process.
- ♣ Chlorine and sodium hydroxide are added to disinfect the water and to correct the pH of the treated water. This protects against any contamination that might occur downstream in the pipes. Fluoride is added for dental health. Lastly, a corrosion inhibitor is included to help control lead and copper release from the pipes. The finished drinking water is stored in a 4 million-gallon tank. Two booster stations pump the treated water north and south

sending it to the City and County drinking water distribution systems for consumption by the public.

Finished water is pumped from BRWTP to BDD's booster station 4A (BS-4A), where it goes to the City's Buckman Wellfield Booster Station 3 and eventually on to the City's 10 million-gallon storage tank, or to booster station 5A (BS-5A), where it travels directly into the City's and County's distribution systems (Appendix A). The maximum daily capacity of the BDD water treatment facility is about15 million gallons. The BDD typically operates at an average of bout 6 mgd.

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.

BDD obtains surface water from the Rio Grande. 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 provisions of the Rio Grande Compact effectively split the available surface water supply for the Rio Grande Basin above Elephant Butte Reservoir into the part north of the Otowi gage and the part south of the gage (see Section 5 for discussion 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 Tesuque Formation, part of the Santa Fe Group aquifer, underlies the BDD area. 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.

Due to the depth of the City's Buckman wells and the hydrogeology of the area, there has been no evidence of any Buckman wells being under the influence of surface water, despite close proximity of several wells to the river, namely Buckman wells (BW) 1 and 8.

4.2 Water Sources

4.2.1 Rio Grande Source Water Quality

According to BDD (Bowman, 2017):

The water quality of the Upper and Middle Rio Grande under base flow ("normal" or ambient) conditions is good overall, with few and occasional minor exceedances of individual water quality standards (NMED/DOE/OB, 2012). Sediments carried in stormwater flow conditions generally exhibit concentrations that are elevated above ambient levels for certain constituents that are attached to soil and sediment particles. Stormwater studies show a strong correlation between certain surface water contaminants such as radionuclides, polychlorinated biphenyls (PCBs), metals and suspended sediment concentrations. That is, many of the contaminants of concern and other chemical compounds have a strong affinity for and are bound to the particles and organic matter in suspended sediments. Storm flow events are short lived, transient, and their sediment loads fluctuate proportionately with changing flow.

The quality of the surface water in the Rio Grande is subject to the Clean Water Act (CWA), and thus subject to the water quality standard listed in 20.6.4 NMAC. Specifically, BDD falls under the 20.6.4.114 NMAC segment of the river, and potential uses are listed in that subsection of the rules, which includes "public water supply." As such, even though the general water quality of this stretch is "good overall," this segment of the Rio Grande is impaired for uses such as irrigation and livestock watering due to the presence of contaminants at concentrations exceeding certain standards. The

2018-2020 State of New Mexico Clean Water Act §303(d)/§305(b) Integrated List (pg. 190) https://www.env.nm.gov/wp-content/uploads/2018/03/Appendix-A-Integrated-List.pdf details all impaired uses and exceedances from standards for this stretch of the river. The figure below depicts many other stretches impaired for different uses in the region of BDD (NM ISC and OSE, 2016.)

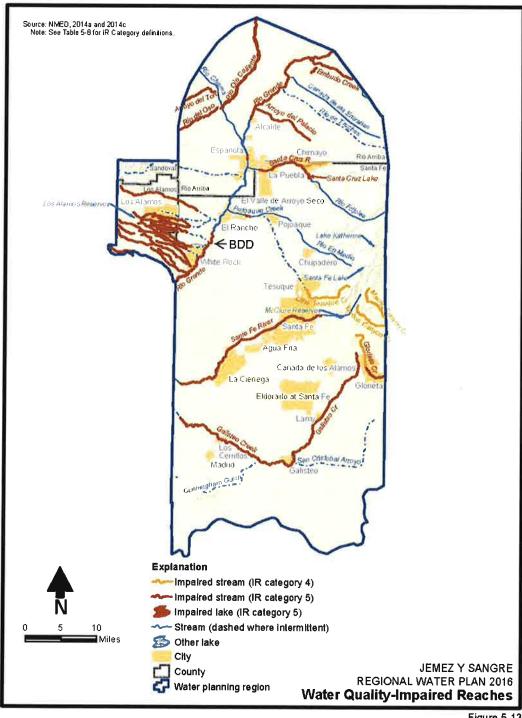


Figure 5-13

BDD monitors the quality of the Rio Grande as part of their National Pollutant Discharge Elimination System (NPDES) permit. EPA Region 6 was satisfied with the results of the first three years of BDD's monitoring of the Rio Grande. In subsequent renewals of the NPDES permit, the EPA has reduced the initial lengthy list of monitored constituents to a more limited list of turbidity, pH, and Whole Effluent Toxicity (WET). However, water quality of the Rio Grande continues to be monitored by other environmental entities, some of them being USGS and NMED under the CWA 303(d) program.

4.2.2 Drinking Water Quality Reports

Drinking water quality is monitored by the NMED DWB under the Safe Drinking Water Act. To protect public health, drinking water quality is checked against the national primary standards (maximum contaminant levels [MCLs]) for 87 constituents and secondary standards (secondary MCLs [SMCLs]) for 15 constituents.

U.S. EPA (2017b) defines primary and secondary standards as follows:

EPA has established National Primary Drinking Water Regulations (NPDWRs) that set mandatory water quality standards for drinking water contaminants. These are enforceable standards called "maximum contaminant levels" (MCLs) which are established to protect the public against consumption of drinking water contaminants that present a risk to human health. An MCL is the maximum allowable amount of a contaminant in drinking water which is delivered to the consumer.

In addition, EPA has established National Secondary Drinking Water Regulations (NSDWRs) that set non-mandatory water quality standards for 15 contaminants. EPA does not enforce these "secondary maximum contaminant levels" (SMCLs). They are established as guidelines to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color, and odor. These contaminants are not considered to present a risk to human health at the SMCL.

As required by the Safe Drinking Water Act, NMED DWB samples BDD's finished drinking water. Of the 70 primary contaminants monitored by the NMED DWB, none have ever been detected at levels exceeding the MCL. A summary of the results from 158 monitored constituents at BDD from 2011 to 2016 is presented in Appendix B. For each tested constituent, the table provides the number of detected results, and the minimum, maximum and average value of all detected values.

Public water systems report the results of required water quality sampling to their customers in a consumer confidence report (CCR.) due July 1st of every year. Results of BDD water quality testing are published under the Santa Fe City's CCR. The CCRs for 2019, 2020, and 2021 are provided in Appendix B, and show concentrations of the monitored constituents in comparison to MCLs. The results from the additional and voluntary drinking water testing are reported on the BDD web site. BDD had not exceeded any MCL for primary contaminant since its start of operation in 2011.

4.2.3 Production Rates

Table 6 summarizes the BDD monthly production of finished water from BS-4A and BS-5A from 2011 to 2021. Figure 5 depicts the total annual production over this time period, while Figure 6 shows these data split by production from BS-4A and BS-5A. The lowest annual production since BDD opening was 1,271 million gallons in 2019; the highest was 2,035 million gallons in 2021.

Table 6. BDD Monthly Production, 2011-2021

							Pro	ductio	on (mil	lion ga	llons)							
Month	2011			2012		2013			2014			2015			2016			
	BS-4A	BS-5A	Total	BS-4A	BS-5A	Total	BS-4A	BS-5A	Total	BS-4A	BS-5A	Total	BS-4A	BS-5A	Total	BS-4A	BS-5A	Total
January	63.7	0	63.7	101.9	25.9	127.8	100.4	48.7	149.1	88.7	34.5	123.2	49,4	45,1	94.5	87.2	27.3	114.4
February	97.3	0	97.3	56.9	21.8	78.7	33.7	43.1	76.8	79.9	30.6	110.5	68,8	30	98.7	65.8	32.9	98.8
March	117.9	1.1	119	60.9	43.3	104.2	74.3	49.2	123.5	111.1	45.4	156.5	65.1	32.9	98	121	44.7	165.7
April	194.8	4.7	199.5	118.2	57.9	176.1	159.2	56.2	215.4	43.9	53.5	97.4	4.5	6.4	10.9	162.1	42.6	204.7
May	130.8	11.3	142.1	155.4	68,9	224.3	230.4	68.8	299.2	174.5	63.9	238.4	66.6	37.8	104.4	103.6	48.7	152.2
June	243.8	6	249.8	131	81.7	212.7	209.1	83.8	292.9	117.9	70,3	188.3	127.7	53.8	181.5	38.2	30,1	68.3
July	110.4	28.3	138.7	22.8	17,9	40.7	71.7	55.6	127.3	68.2	58.6	126.8	70.3	49	119.3	53.6	61.3	114.9
August	10	23.9	33.9	34.3	43.3	77.6	0.0	8.2	8.2	91.1	65	156.1	83.8	46.6	130.4	18.4	27.9	46.3
September	92.9	63.3	156.2	157.7	57.2	214.9	7.9	9.8	17.7	109.4	75.4	184.8	134	60.3	194.2	121.2	56.2	177.4
October	118.6	59.1	177.7	179	57.5	236.5	30.4	56.4	86.8	81,2	69	150.1	151.9	49.7	201.5	181.6	32.1	213.7
November	95.2	47.6	142.8	128.1	40.3	168.4	47.9	43.6	91.5	71.7	60.3	131.9	109.3	43,6	152.9	113	18.1	131.1
December	97	39.2	136.2	129.2	44.6	173.8	53.2	32.6	85.8	81.8	59.7	141.5	69.3	23.7	92.9	101.2	12.8	114
Total Annually	1372.4	284.5	1656.9	1275.4	560.3	1835.7	1018.2	556.0	1574.2	1119.4	686.2	1805.5	1000.7	478.9	1479.2	1166.9	434.7	1601.5

						Produ	ction (millior	gallo	ns)					
Month		2017		2018				2019			2020		2021		
	BS-4A	BS-5A	Total	BS-4A	BS-5A	Total	BS-4A	BS-5A	Total	BS-4A	BS-5A	Total	BS-4A	BS-5A	Total
January	90.3	34.1	124.3	65.1	47.6	112.7	70.9	28.3	99.2	128.9	6.4	135.3	86.3	31.4	117.7
February	85.1	33.6	118.7	61.8	42.5	104.3	54.1	25.4	79.5	102.3	21.8	124.1	95.0	31.2	126.2
March	104.9	50.8	155.7	41.1	50.1	91.2	20.9	21.0	41.9	79.2	28.2	107.4	102.0	36.7	138.7
April	99.8	64.5	164.3	133.3	43.6	176.9	12.1	13.6	25.7	67.1	35.0	102.1	133.1	47.2	180.3
May	64.0	65.0	129.0	204.5	52.9	257.4	92.9	41.3	134.2	103.1	55.0	158.1	194.3	56.5	250.8
June	82.1	71.3	153.4	170.9	59.3	230.2	81.5	49.1	130.6	94.9	65.2	160.1	178.8	70.0	248.8
July	85.6	74.0	159.7	166.9	61.8	228.7	111.6	59.4	171.0	141.3	66.0	207.3	100.9	59.9	160.8
August	81.4	68.9	150.2	140.2	56.6	196.7	60.7	44.6	105.3	180.0	71.0	251.0	158.4	65.7	224.1
September	117.2	66.7	183.9	95.0	45.0	139.9	111.3	26.7	138.0	155.7	50.0	205.7	118.1	43.7	161.8
October	79.3	54.8	134.1	119.1	34.6	153.8	115.3	30.4	145.7	121.1	50.0	171.1	146.4	19.6	166.0
November	47.4	47.8	95.2	99.3	26.8	126.0	69.8	26.7	96.5	87.1	27.8	114.9	100.0	31.7	131.7
December	61.8	48.7	110.5	86.3	26.4	112.7	94.4	9.1	103.5	92.4	28.7	121.1	97.5	30.4	127.9
Total Annually	998.8	680.1	1679.0	1383.3	547.2	1930.5	895.5	375.6	1271.1	1353.1	505.1	1858.2	1510.8	524.0	2034.8

Figure 5. BDD Total Annual Production, 2011-2021

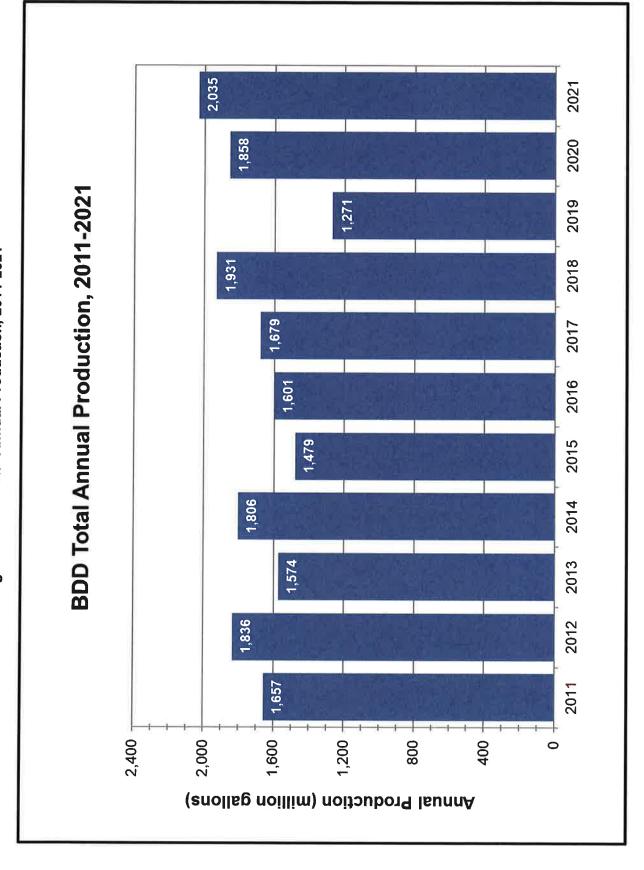
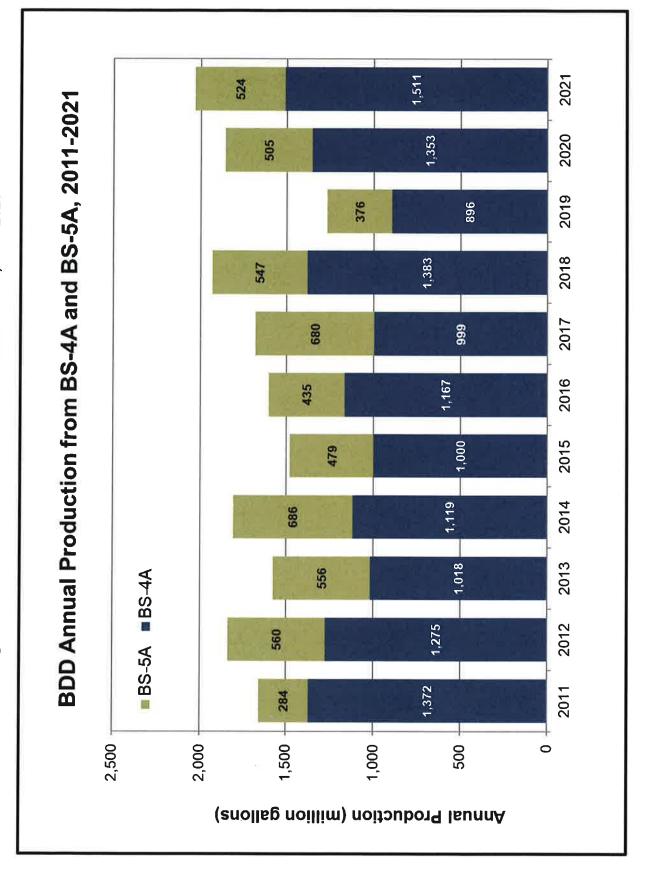


Figure 6. BDD Annual Production from BS-4A and BS-5A, 2011-2021



5. WATER SUPPLY CHANGES AND IMPACTS

5.1 Historical Change and Impacts

During the severe drought experienced by Santa Fe from the late 1990s to 2002, and despite ongoing and very successful water conservation programs, the Santa Fe region did not have enough reliable and sustainable drinking water sources to meet the growing needs. The City of Santa Fe and the County of Santa Fe designed a sustainable water supply project, the BDD project, to help protect our region from running out of water during a drought.

The project was needed to supplement the two sources of water the local community depended on – groundwater wells and reservoirs on the Santa Fe River. The groundwater wells were not sustainable at the pre-BDD pumping levels due to increasing demand, and the local reservoirs can run out of water during a dry year. The BDD promised to provide a new source of surface water in addition to the existing supplies of surface water and help the regional aquifer rest and recharge (refill) so that it will be here for the future generations. The City or Santa Fe and the County of Santa Fe constructed the BDD to add this source of water by diverting and treating water available from the Rio Grande that they cannot access through groundwater pumping.

The BDD came online in January 2011. In May 2011, after nearly a decade in development, the Buckman Direct Diversion Board (BDDB) assumed responsibility for the day-to-day operations, management and maintenance of the Buckman Regional Water Treatment Plant (BRWTP) and facilities. This new water supply source is reliable, sustainable and provides flexibility in how the city and county choose to use the different supply sources for water consumption. Operation of all four sources (Section 3.2.1) will continue to meet the needs of city and county water system customers, improve the regional public water supply under drought conditions, and replace unsustainable groundwater pumping making a drought reserve possible.

5.2 Need for Future Water Sources

BDD is currently able to meet the demand of its customers. There are no plans for expanding the BDD system or water rights holdings.

6. Source Water Protection Area

The source water protection area (SWPA) is described as a buffer around wells, reservoirs, and on either side of rivers, streams, and canals for use in identifying potential contamination from sources within close proximity. For the purposes of BDD's SWPP, the SWPA begins 500 feet downstream of the intake and ends 10 miles upstream. In reality, catastrophic contaminations occurring upstream from BDD of even more than 10 miles may influence the river water quality and may influence the BDD operations. However, in order to make this plan practical and feasible, the limit of 10 miles upstream will be accepted as the upper limit of the SWPA. Tributaries within this SWPA are included even if not specifically delineated on Figure 7.

For purposes of delineating surface water SWPAs, NMED distinguishes between two different types of watersheds, Type A and Type B, defined as follows:

Type A watersheds are defined as having an area under 30 square miles. Buffer zones within the watershed are 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.
- Buffer Zone C is the balance of the land area extending to the topographic boundary.

Type B watersheds are defined as having an area over 30 square miles. Potential source of contamination (PSOC) inventories and susceptibility analysis are applied only to that portion of the watershed defined as "critical stream segments," as follows:

- Buffer 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.
- ♣ Buffer Zone C is a ½-mile wide corridor of land paralleling either bank of an active stream channel.

The Rio Grande has a Type B watershed; therefore, the SWPA is subdivided into the following three zones:

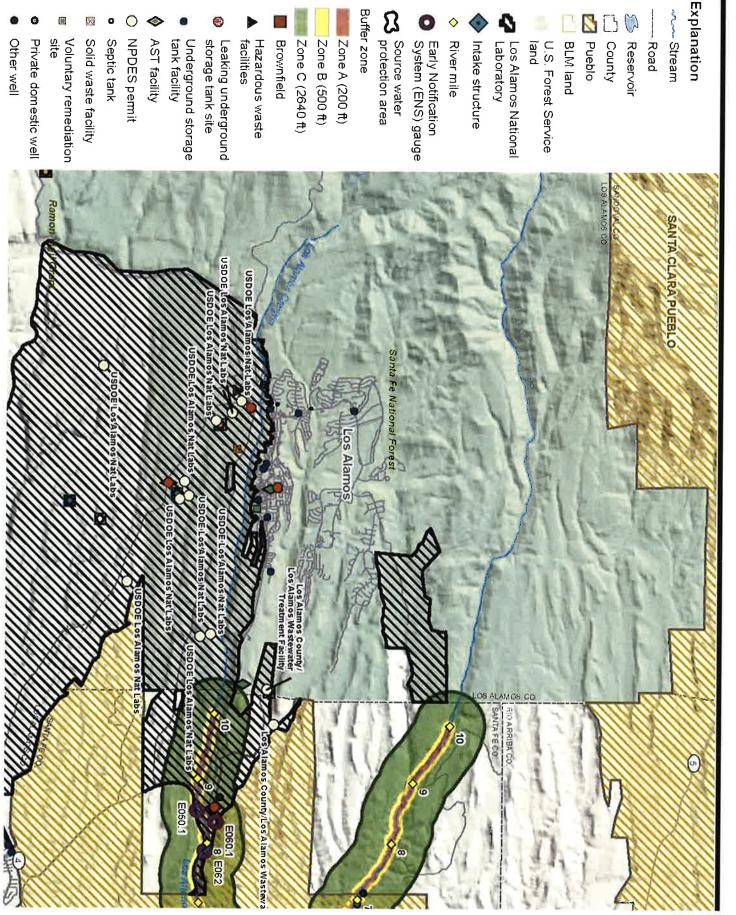
- ♣ Zone A: radius of 0 to 200 feet from each stream bank
- ♣ Zone B: radius of 201 to 500 feet from each stream bank
- Zone C: radius of 501 to 2,640 feet from each stream bank

In addition to the Rio Grande, two other large tributaries have been added to the BDD SWPA: Los Alamos Canyon and Guaje Canyon, both being dry canyons (ephemeral) and part of the Los Alamos Canyon watershed. When these ephemeral streams flow, they may carry the LANL legacy waste contaminated sediments to the Rio Grande. Over the years, LANL-contaminated sediments have settled along the banks of Los Alamos Canyon, especially in its lower portion. Englert (NMED DOE OB, 2011) found that most contaminated sediments transported to the lower Los Alamos Canyon from the contaminated sources (upper Los Alamos Canyon and Pueblo Canyon) settle in the lower Los Alamos Canyon and only small part (19%) of the mobilized contaminated sediments discharge to the Rio Grande. While Guaje Canyon is not known to be affected by LANL contamination, it flows into the lower Los Alamos Canyon, and can therefore remobilize contaminated sediments from the lower Los Alamos Canyon and discharge them to the Rio Grande.

The BDD SWPA for the Rio Grande, including the delineated portions of Los Alamos Canyon watershed, is shown in Figure 7. The total area of the delineated SWPA is 22.03 square miles: 5.76 square miles in Los Alamos Canyon, 5.41 square miles in Guaje Canyon, and 10.86 square miles in the Rio Grande. For ease in identifying and tracing PSOCs, river miles have been added to the map, starting 500 feet downstream of the intake and moving upstream. Guaje Canyon meets Los Alamos Canyon between Los Alamos Canyon river miles 4 and 5; the convergence of Los Alamos Canyon into the Rio Grande occurs between Rio Grande river miles 3 and 4. The stream and river mile will be stated in all text and table references (e.g., Los Alamos Canyon river mile 7 versus Guaje Canyon river mile 7 or Rio Grande river mile 7).

The delineated SWPA meets the criteria of the NMED DWB guidance for establishing an area to evaluate for 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 the river's SWPA and PSOCs. A map encompassing the PSOCs in all watersheds upstream from BDD is included in Appendix E.



7. POTENTIAL SOURCES OF CONTAMINATION (PSOC)

7.1 Overview of Potential Contaminant Sources and Risk Assessment

Potential sources of contamination (PSOCs) are defined as any possible site or event that could, under any circumstance and time frame, lead to contamination of drinking water sources. Not all sites identified as PSOCs pose the same level of risk. Depending on the type of PSOC, some sites may pose little to no contamination risk, while others may pose an imminent threat. Sources of contamination (SOCs) are considered those activities or environmental accidents that are currently threatening or contaminating the source water

The source water protection area (SWPAs) for BDD was described in the previous section and delineated on Figure 7.

Following the identification of PSOCs, a risk assessment was performed for each contaminant. This methodology is based on a technique developed by the Colorado Rural Water Association (e.g., CRWA 2017) and involves estimation of risk using two parameters: the "probability of impact" and the level of "impact to the water system."

The "probability of impact" changes in increasing order from "rare" to "certain", and the "impact to the water system" changes in increasing order from "insignificant" to "catastrophic." For definition of each level of these parameters, see the table below. When determining the risk for a source of contamination, one will find the "impact to the water system" along the x-axis and then along the vertical y-axis find the level of "probability of impact" in order to determine the overall risk of that specific source of contamination. The factors influencing both parameters will be how close the source is to the water resource, how large the contamination is or could be, how potent or toxic the contaminant of concern is and how fast the contamination could be transported toward the water resource.

Table 7. Risk Assessment Decision Table

SWAP Risk Assessment Matrix

				Risk		
Impact	Certain	Low	Moderate	High	Very High	Very High
	Likely	Low	Moderate	High	High	Very High
	Possible	Low	Moderate	Moderate	High	High
	Unlikely	Very Low	Low	Moderate	Moderate	Moderate
	Rare	Very Low	Very Low	Low	Low	Low
•						
		Insignificant	Minor	Significant	Major	Catastrophic
		17.				

Impact to Water System

Instructions: Use this matrix like a graph. Identify the "Impact to Water System" on the X axis, then identify the "Probability of Impact" on the Y axis. The risk is determined by the intersection of these two lines.

	Impact: The following descriptions provide a framework to estimate the relative at damage or loss would occur within one to ten years.							
Certain:	>95% probability of impact							
Likely:	>70% to <95% probability of impact							
Possible:	>30% to <70% probability of impact							
Unlikely:	>5% to <30% probability of impact							
Rare:	<5% probability of impact							

Impact to Water public water syst	System: The following descriptions provide a framework to estimate the impact to the tem.
Catastrophic:	Irreversible damage to the water source(s). This could include the need for new treatment technologies and/or the replacement of existing water source(s).
Major:	Substantial damage to the water source(s). This could include a loss of use for an extended period of time and/or the need for new treatment technologies.
Significant:	Moderate damage to the water source(s). This could include a loss of use for an extended period of time and/or the need for increased monitoring and/or maintenance activities.
Minor:	Minor damage resulting in minimal, recoverable, or localized efforts. This could include temporarily shutting off an intake or well and/or the issuance of a boil order.
Insignificant:	Damage that may be too small or unimportant to be worth consideration, but may need to be observed for worsening conditions. This could include the development of administrative procedures to maintain awareness of changing conditions.

After determining the risk a source of contamination poses to the water system, it is important to determine whether the water system can *control* the source by any means or *control* the contamination from the source by any means. The level of water system *control* describes the ability of the water system to take measures to prevent contamination or minimize impact. A potential contaminant source that falls within a water system's jurisdiction (i.e. direct control), may be of higher priority since they can take direct measures to prevent contamination or minimize the impact.

- Direct Control The water system can take direct measures to prevent.
- ♣ Indirect Control The water system cannot directly control the issue, but can work with another person or entity to take measures to prevent.
- No Control − The PSOC or issue of concern is outside the control of the public water system and other entities.

Several different resources were used to compile a list of all possible PSOCs within BDD's SWPA. 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, 2017a), geologic reports, previous reports provided by BDD, the City of Santa Fe, and Santa Fe County, 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 BDD's SWPA, as discussed in the following subsections and shown on Figure 7.

7.2 Human Sources of Contamination

The human-caused PSOCs that can be mapped and are known to occur in BDD's SWPA and the types of those PSOCs are listed in Table 8. NMED has compiled an extensive database of human sources of contamination and that database was used to generate the PSOCs on Figure 7 and Figure 8. GIS data for septic tanks (map code RSF) were not included in any of the state's databases. Because no sewer service is available in the area, RSF sites were added for each building using aerial imagery from the U.S. Department of Agriculture (USDA) National Agriculture Imagery Program (NAIP) (dated 2014).

Table 8. Human-Caused Potential Sources of Contamination

Map Code	Land Use	Description	Contaminants of Concern
ADC	Drainage canals, ditches or acequias (unlined)	Runoff and infiltration	Pesticides, herbicides, fertilizers, nitrate, pathogens
Arroyo	Ephemeral stream	Runoff and infiltration	Pesticides, herbicides, fertilizers, nitrate, pathogens
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
СНС	Historic gasoline service station	Above/below ground storage tanks/operations	Gasoline, oils, solvents, automotive wastes, septage
css	Gasoline service station	Above/below ground storage tanks/operations	Gasoline, oils, solvents, automotive wastes, septage
ICC	Cement/concrete plant	Operations/maintenance/ storage	Organic/Inorganic chemicals, oils, natural gas, propane
MPW	Polluted Surface Water Sources	Naturally occurring/ anthropogenic	Sewage, pathogens, nitrate, metals, acids, bases, organic/inorganic chemicals
MRP	Primary road, highway, or arterial	Public street, thoroughfare, highway, or main road	Gasoline, diesel fuels, metals, stormwater runoff, hazardous materials, radiological materials
NPDES permit	National Pollutant Discharge Elimination System (NPDES) permit	Discharge from a point source into waters of the United States	Sewage, sewage sludge, metals, pathogens, organic/inorganic chemicals
PDW	Private domestic well	Private domestic well that is registered with the OSE	Conduit for any contaminant to enter aquifer
RSF	Residential septic system	Wastewater discharge to septic tank, leach field, or cesspool	Septage, pathogens, nitrate, ammonia, chloride, heavy metals, household pesticides, herbicides, cleaning agents and solvents, fuels

Note: The human-caused PSOCs listed in this table include only those that can be mapped. See the following subsections for discussion of others known to exist for the BDD system.

7.2.1 Los Alamos National Laboratory (LANL)

The Los Alamos and Pueblo canyons (LA/P canyons) are located on the Pajarito Plateau where for decades Los Alamos National Laboratory had discharged contaminated waste and wastewater as part of the "Manhattan Project" and later LANL's nuclear weapons program. The confluence of these canyons with the Rio Grande is located nearby Otowi Bridge, 3.5 miles upstream from BDD. The LA/P canyons are ephemeral streams and when they flow, their run off may carry

contaminants from the canyons and discharge them into the Rio Grande near Otowi Bridge and transport them downstream to BDD.

ASTDR (2006).

(Page 3) Site Description and Operational History

LANL covers approximately 28,000 acres in north central New Mexico. Most of the laboratory lies within Los Alamos County; a smaller portion is in Santa Fe County. Albuquerque is approximately 60 miles to the southwest and Santa Fe is approximately 25 miles to the southeast. The Bandelier National Monument borders LANL's southwestern boundary. Los Alamos is adjacent to LANL's northern boundary and White Rock is adjacent to the southeastern boundary. The San Ildefonso Pueblo is to the east; national forest lands border the northwestern, the northern, and the southeastern LANL boundaries (Figure 1). Large parts of these areas remain undeveloped (LANL 1999).

(Page 5) Environmental Setting

The Jemez Mountains to the west and the Sangre de Cristo Mountains to the east dominate the vast, naturally beautiful landscape in which LANL is situated. The Rio Grande flows north to south, dividing the mountain ranges and, over geological time, contributing to the creation of the Pajarito Plateau, a volcanic shelf on the eastern slope of the Jemez Mountains on which LANL is situated. The plateau comprises finger-like mesas separated by steeply sloped canyons. Cut by intermittent streams, the canyons are oriented east-to-west, at right angles to the Rio Grande. The mesa elevations range from 7,800 feet (ft) at the base of the Jemez Mountains to 6,200 ft at their eastern end, where they rise above the Rio Grande Valley (LANL 1999).

Of all canyons on the Pajarito Plateau, Los Alamos Canyon and its tributaries (DP Canyon, Pueblo Canyon, Pueblo's tributary Acid Canyon, Bayo Canyon, and Guaje Canyon) drain into the Rio Grande River near the Otowi Bridge, approximately 3.5 miles upstream of the BDD Intake structure. The rest of the Pajarito Plateau canyons drain downstream from BDD.

Wastes discharged in Los Alamos watershed are listed in Reneau (1998):

TA-45 was the site of the first radioactive liquid waste treatment plant at the Laboratory, and radioactive effluent was discharged from TA-45 into Acid Canyon, a small tributary of Pueblo Canyon, between 1944 and 1964 (LANL 1981, 6059; LANL 1992, 7668). This effluent was untreated before 1951, when the first treatment plant became operational, and the highest concentrations of radionuclides were probably discharged before this time. TA-45 was the source for most of the plutonium-239, 240 within

the Los Alamos Canyon watershed and was also the source for other radionuclides present at much lower concentrations, including americium-241, cesium-137, plutonium-238, strontium-90, and tritium.

TA-21 was established in 1945 on DP Mesa and was the site of a plutonium processing plant and radionuclide research laboratories (LANL 1991, 7528). Treated radioactive liquid waste was discharged at the 21-011(k) outfall into DP Canyon, a small tributary of upper Los Alamos Canyon, between 1956 and 1985. The 21-011(k) outfall was the source for most of the americium-241, cesium-137, and strontium-90 within the Los Alamos Canyon watershed and was also the source for other radionuclides at much lower concentrations, including plutonium-238; plutonium-239,240; tritium; and several isotopes of uranium and thorium. Discharges of cesium-137 and strontium-90 from the 21-011(k) outfall were apparently highest before 1968, and discharges of americium-241 were apparently highest after 1978.

According to ASTDR (2006):

(Page ix) Past activities have released radioactive and chemical wastes to the soil, air, and water surrounding the LANL. Historically, laboratory personnel discharged liquid wastes into canyons, buried solid wastes in the ground, and released air emissions into the atmosphere. On occasion, accidental spills also occurred.

(Page 18) Waste Received

In addition to the natural run-off produced by precipitation and springs, surface water flow in the canyons is augmented by effluent from LANL activities. Since LANL's opening in the 1940s the canyons adjacent to LANL have received treated and untreated radioactive and sanitary waste. Acid, Pueblo, and Los Alamos Canyons were the primary recipients of untreated radioactive liquid waste.

(Page 20 and 21) The highest levels of radioactivity for surface water were found in Los Alamos Canyon (total uranium and gross alpha). For sediment, the highest levels were typically detected in Los Alamos Canyon (americium-241, cesium-137, strontium-90, and total uranium). Acid Pueblo Canyon had the highest level of plutonium-239/240. The highest values of water quality parameters and inorganics (in surface water and sediment) were distributed primarily throughout Los Alamos and Acid Pueblo Canyon. Overall, strontium-90, chloride, fluoride, sodium, and arsenic were detected above CVs [comparison values] with the greatest frequency. Acid Pueblo Canyon had the only detections of organics in surface water and Los Alamos Canyon had the only detections of organics in sediment. Specific contaminants found in each area is discussed below and summarized in Tables 7 to 10.

Acid Pueblo Canyon

From this canyon, gross alpha radiation was the only radiological test result detected above its CV in surface water. At least twice in the sediment cesium-137, plutonium-239/240, and strontium-90 were all detected above their CVs. Strontium-90 (to 5 pCi/g) was the only 20 Los Alamos National Laboratory Public Health Assessment radionuclide to exceed its CV by more than a factor of 10. Two organics, five water quality parameters, and eight inorganics were also detected above CVs in the surface water. Chloride (to 300 ppm) and arsenic (to 0.019 ppm) were the only two to exceed their CV by more than a factor of 10. Fluoride, nitrate, sodium, and boron were detected above their CVs with the greatest frequency (more than three times). Three inorganics were also detected above CVs in the sediment, but only arsenic was detected more than once. None of the inorganics detected in the sediment exceeded their CV by more than a factor of seven.

Los Alamos Canyon

In the surface water, both total uranium (to 576 pCi/L) and gross alpha (to 520 pCi/L) were detected above their CVs. Three water quality parameters and seven inorganics were also measured above CVs. The maximum detected concentration of all four water quality parameters exceeded CVs by at least 30 times. Arsenic (to 0.017 ppm) was the only inorganic with the maximum detected concentrations greater than 10 times its CV. In sediment, americium-241, cesium-137, plutonium-239/240, and strontium-90 were detected above CVs. Arsenic, benz(a)anthracene, and benzo(a)pyrene were also found above CVs.

The LANL legacy contaminants of highest concern are the following radionuclides: plutonium-239/240, plutonium-238, americium-241, strontium-90, cesium-137, and uranium isotopes since those contaminants have been identified as contaminants in the Los Alamos Canyon watershed in multiple studies by different agencies (federal and state). All of these contaminants are transported predominantly via suspended sediments. This characteristic makes these contaminants likely to be transported downstream to the BDD during storm events when a lot of sediments are agitated and mobilized. The BDD treatment processes are focused on removal of solids from the raw water, and therefore, many contaminants with affinity to solid particles would be managed by the BDD treatment system.

As described in BDD (2016), contamination from LANL reaches BDD as follows:

Periodic floods during the 1950s and 1960s of the Los Alamos/Pueblo Canyons watershed transported the discharged contaminants downstream from the source of release and ultimately to

the Rio Grande, and hence to the BDD Intake location. This fact was researched and documented in the works of (Graf, 1994), (Graf, 1996), and (Englert, Dale, Granzow, & Mayer, 2007). By the 1970s the flood frequencies and magnitudes diminished and transported contaminants were stored in sediments in and along the dry stream channels and floodplains of the canyons that run through the Laboratory. Since then and until the Cerro Grande Fire, the frequency of flooding from canyons at LANL diminished and clean sediments along the Rio Grande have covered contaminants that have reached the river.

According to NMED/DOE Oversight Bureau, since the Cerro Grande fire in 2000, canyon floods have increased in intensity and frequency and are eroding the emplaced sediments, exposing and carrying legacy contaminants to the Rio Grande at rates not seen since the discharges of the wastes in the 1950s and 1960s (NMED/DOE/OB, 2012).

LANL has taken some remedial actions in Los Alamos and Pueblo Canyons since the Cerro Grande fire pursuant to the requirements of NMED Order on Consent (2005 and 2016). These actions include installation of sediment retention structures, enhancement of riparian conditions that stabilize sediments, and enhancement and management of a large wetland in Pueblo Canyon that minimizes sediment and contaminant transport. LANL reports that the post-fire (Cerro Grande in 2000, and later, Las Conchas in 2011) watershed hydrology has recovered, partly because of the remedial actions described above.

BDD Board and DOE/LANL

In 2010, prior to coming online, BDD entered into a Memorandum of Understanding (MOU), a legally non-binding agreement, with DOE/LANL to monitor and sample surface water from Los Alamos and Pueblo Canyons in order to determine the storm water quality at the BDD (BDD and DOE, 2015). Under this agreement, which was renewed in 2015 and 2017, the following programs have been maintained:

♣ Early notification system (ENS), a preventive program with the following objectives:

Two or three gaging stations relay real-time stage height data in 5-minute intervals to the BDD Control Room through SCADA, and another video station relays images only. The participating LANL stations are described in the 2017 renewed MOU (Figure 7): (1) LANL gaging station E050.1 in Los Alamos Canyon above the Pueblo Canyon confluence, (2) LANL gaging station

E060 in Pueblo Canyon above the Los Alamos confluence, (3) video station E062 in the Los Alamos Canyon below the confluence of Los Alamos and Pueblo Canyons, and (4) LANL gaging station E099 (not depicted on Figure 5), the farthest downstream from LANL gaging station within the ENS, located in Guaje Canyon above the confluence of Guaje Canyon and Los Alamos Canyon. The previously participating gaging station E109.9 (shown on Figure 7) was located in the lower Los Alamos Canyon, 0.7 miles from the Rio Grande. That station was buried by sediment carried by strong storm flow in September 2013.

When storm flows exceed 5 cubic feet per second (cfs) at the LANL gages, BDD is notified. The trigger flow of 5 cfs was selected by LANL (under the Los Alamos/Pueblo Canyons Stormwater Monitoring Plans) as a flow with the potential to reach the Rio Grande: "Samples at E050, E060, and E110 will be triggered by 5-cfs flows to ensure sampling at flows that may extend to the Rio Grande." Page 3 of LANL (2009). When such storm flows are streaming in Los Alamos Canyon, the diversion will close for 10 to 12 hours or until the storm has subsided.

Surface water sampling program of stormwater and baseflow of the Rio Grande at BDD.

When storm run offs of 5 cfs or greater flow in the Los Alamos and Guaje Canyons as measured by the LANL gages, water quality sampling will be triggered at BDD. Costs for sampling, equipment, and maintenance are shared between the BDD Board and DOE/LANL.

Samples collected from this program are tested for the following constituents: suspended sediment concentration, total and dissolved metals (23) plus mercury, gross alpha, gross beta, strontium-90, americium-241, radionuclides by gamma spectroscopy (including cesium-137), plutonium (isotopic), uranium (isotopic), neptunium-237, dioxin/furans, PCBs, radium-226 and -228, and perchlorate.

Pursuant to the 2017 MOU, DOE funds costs up to a certain dollar amount for BDD sampling at the intake, after which BDD funds the costs.

The Contaminant Fate Analysis (CFA) Program and The Removal Efficiency and Assessment of Treatments (TREAT) Study.

The CFA program was initiated in 2010 to determine the effectiveness of the BDD treatment technologies at treating contaminants diverted from the Rio Grande.

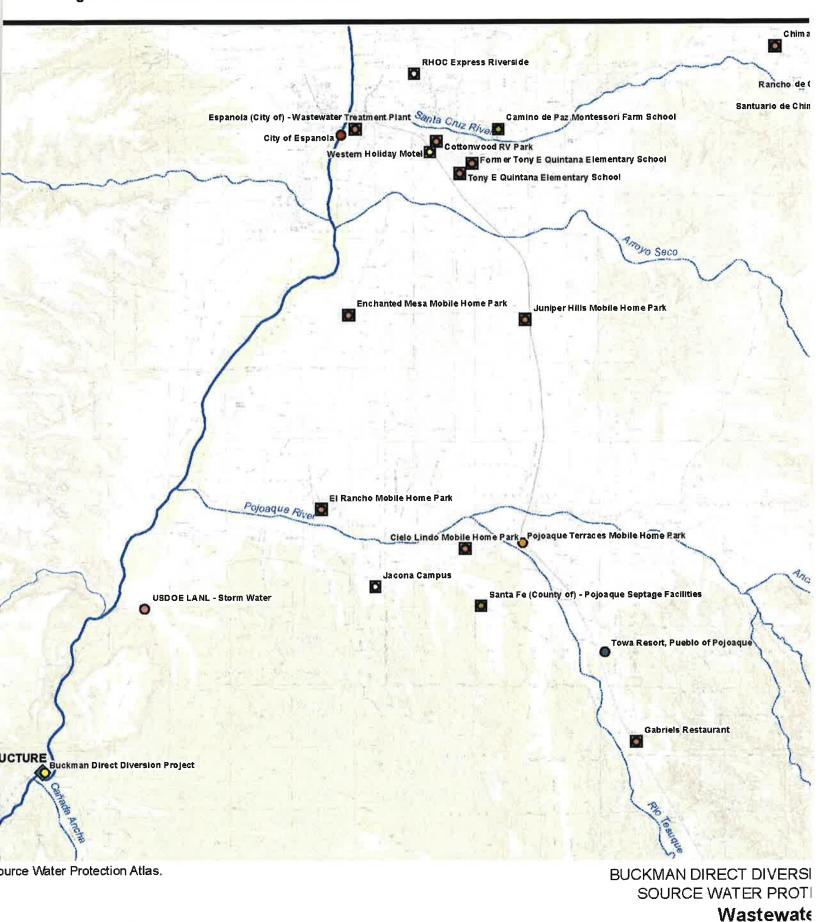
In 2015, the CFA Program was replaced with a similar but updated and improved program called the TREAT Study (BDD and DOE, 2015) with the similar objectives as the CFA program. TREAT Study is entirely funded by the BDD Board.

City of Santa Fe and DOE/LANL

Sampling for contaminants at the Buckman wells (City of Santa Fe) shows that contamination from LANL waste disposal activities has not affected groundwater in the Buckman area. While ChemRisk (2010) found that "[t]here are no contributions from LANL groundwater to the Buckman well field," in an abundance of caution, LANL has conducted sampling since 2001 at Buckman wells 1, 6, and 8 and piezometers SF-4A and SF-3A, providing the data to the City for identification of possible groundwater contamination from past activity at LANL. From the 2015 CCR (Appendix B) regarding possible LANL groundwater 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 [10 Million Gallon] prior to distribution into the system.

Figure 8. Wastewater Facilities around BDD



7.2.2 National Pollutant Discharge Elimination System (NPDES) Permits

Wastewater treatment plants (WWTPs), stormwater and industrial discharges must obtain a NPDES permit in order to discharge effluent water into a stream. The EPA, who administers NPDES program, describes the permits as follows (U.S. EPA, 2016):

As authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) Permit Program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Point sources are discrete conveyances such as pipes or man-made ditches. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters. Since its introduction in 1972, the NPDES permit program is responsible for significant improvements to our Nation's water quality.

Figure 8 shows WWTPs upstream of BDD. Table 9 lists the holders of NPDES permits within 15 miles of the BDD intake

Table 9. NPDES Permits within 15 miles Upstream of BDD Intake

NPDES Permit Holder	Distance Upstream of BDD Intake (miles)
Towa Resort (WWTP)	14.3
Pojoaque (WWTP)	12.6
Pojoaque Terraces Mobile Home Park (WWTP)	12.0
Los Alamos Co. – Bayo Canyon (WWTP)	9
Los Alamos National Laboratory (stormwater, industrial)	3 (stormwater)/ 9 (industrial)
Española (WWTP)	13.2

In addition to those listed in Table 9, the two next closest WWTPs are the Abiquiu MDWCA & MSWA and the Town of Taos. Abiquiu's plant is approximately 41 miles upstream of the BDD intake via the Rio Grande and Rio Chama. Taos's WWTP is approximately 57 miles upstream of the BDD intake via the Rio Grande and the Rio Pueblo.

Wastewater, stormwater or other industrial effluent discharged into U. S. waters must meet state and federal effluent water quality standards (U.S. EPA, 2016):

An NPDES permit will generally specify an acceptable level of a pollutant or pollutant parameter in a discharge (for example, a certain level of bacteria). The permittee may choose which technologies to use to achieve that level. Some permits, however, do contain certain generic 'best management practices' (such as installing a screen over the pipe to keep debris out of the waterway). NPDES permits make sure that a state's mandatory standards for clean water and the federal minimums are being met.

However, levels of pharmaceuticals and personal care products (PPCPs) and other emerging contaminants in effluent are currently not monitored. PPCPs are not subject to regulatory limits and removal of the traces of those products requires advanced treatment. Given the relative volume of flows in the Rio Grande, it is expected that adequate dilution of these contaminants occurs before the water reaches the BDD intake.

7.2.3 Groundwater Discharge Permits

Active, ceased, pending, inactive, terminated, and withdrawn groundwater discharge permits are shown on Figure 8. Groundwater discharge permits are managed by NMED. The NMED Groundwater Pollution Prevention Section describes groundwater discharge permits as follows (NMED GWQB, 2017):

The Ground Water Pollution Prevention Section (GWPPS) reviews and approves ground water Discharge Permits for discharges that have the potential to impact ground water quality pursuant to Subparts III and V of the Water Quality Control Commission (WQCC) regulations (20.6.2 NMAC). Ground water Discharge Permits address a wide variety of discharges including:

- Domestic wastewater facilities
- Large capacity septic tank leachfields
- Reclaimed wastewater reuse
- Power generating plants
- Commercial laundries (when not served by sanitary sewers)
- Commercial land farms for treatment of contaminated soil
- Industrial discharges
- Groundwater remediation systems

 Groundwater Discharge Permits for dairies and non-dairy agricultural facilities, such as cheese plants and chile processors, are managed by the Agriculture Compliance Section.

This program also addresses unauthorized discharges, such as spills, for facilities that it regulates. Section 20.6.2.1203 of the NMAC provides a description of how to proceed with notifying the Pollution Prevention Program (GWPPS) in case of a spill.

Permits are issued for 5-year terms and must be renewed to provide continuous coverage. The GWPPS currently manages approximately 1,000 active permits.

7.2.4 Septic Systems

Septic systems are typically installed 3 to 5 feet below the ground surface. Such system may become a PSOC when a septic system's leach field is not operating properly and the effluent from the septic tank may runoff into nearby waterways. DBS&A mapping efforts estimate that there are nearly 200 septic systems in BDD's SWPA.

7.2.5 Security

To deter tampering and damage at BDD-owned facilities, BDD contracts Chavez Security Inc. (CSI), a security company, to monitor on a regular basis the Diversion intake, lift station, and booster pump stations.

7.3 Natural Sources of Contamination

Arroyos, drainage canals, ditches, and acequias are known natural features that can convey natural or anthropogenic contaminants into the Rio Grande. These features can be mapped in the SWPA for BDD. Wildfires and turbidity are two other natural sources of contamination that are not easily mapped.

7.3.1 Wildfires

Wildfire is a natural PSOC that represents a very real and significant threat to BDD's water source. Wildfires affect the type and quantity of nutrients (especially nitrogen) in the river, 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.

Since the 1970s, there have been four stand-replacing fires in the Jemez Mountains: the La Mesa fire (1977), the Dome fire (1996), the Cerro Grande fire (2000), and the Las Conchas fire (2011) (BDD, 2016). The La Mesa and Dome fires affected watersheds downstream of the BDD. The BDD was not yet built in 2000 during the Cerro Grande fire. The Las Conchas fire, the largest wildfire in northern New Mexico history, burned 163,000 acres. The fire drastically changed the Los Alamos and Pueblo Canyon watersheds, and the distribution of contaminated sediments in that area, and is cited as the cause for increased quantities of LANL contaminants in stormwater at the BDD intake during the fire and some years afterwards.

7.3.2 Turbidity

Storm events in the upper Rio Grande watershed lead to increased turbidity at the BDD intake. Because the high sediment content in the raw water can cause serious damage to the BDD equipment, diversions are stopped during periods of high turbidity. There is not a pre-determined turbidity threshold at which diversions are ceased; rather, the Operations Superintendent monitors river turbidity daily to balance the need to supply water to customers with the need to protect equipment life. In the past, high sediment loads have led to shutoff periods ranging from one hour to three months.

7.4 Risk Assessment

To assess potential contamination risks from the known PSOCs to a water system, a "probability of impact" ranking is assigned to each water source. A "probability of impact" ranking of rare, unlikely, possible, likely, certain 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.

The "impact to water system" ranking is based on an inventory of the type, number, and proximity of PSOCs near a water source, and is a subjective ranking based on that inventory. An "impact to water system" ranking of insignificant, minor, significant, major, catastrophic is assigned to each PSOC.

The first consideration in "impact to water system" ranking is the types of PSOC present. The mapping effort for Los Alamos Canyon revealed eight PSOC types in this river segment: aboveground storage tank facility (CFA), arroyos, gasoline service station (CSS), a leaking underground storage tank (CFB), polluted surface water sources (MPW), major roads (MRP), private domestic wells (PDW), and septic systems (RSF). Furthermore, while they cannot be mapped, LANL legacy contaminants are known to exist in this canyon. Polluted surface water sources (MPW) and arroyos and private domestic wells (PDW) were the two identified PSOC types in Guaje Canyon. Although not identified on the map when Guaje Canyon flows, it picks up LANL-contaminated sediments in lower Los Alamos Canyon and carries them to the Rio Grande. There are eight mapped PSOC types in the SWPA for the Rio Grande: canals, drainage ways and acequias (ADC), historic gasoline service stations (CHG), cement/concrete plants (ICC), arroyos, major roads (MRP), NPDES permits, private domestic wells (PDW), and septic systems (RSF). Sedimentation (turbidity) is a significant PSOC caused by storm events for all three river segments. Wildfires are a major PSOC for all three river segments as well.

The number of PSOC occurrences is another consideration in determining the "impact to water system" ranking of a water source. Table 11 shows the PSOC count by river segment. Guaje Canyon has 15 mapped PSOC occurrences, while Los Alamos Canyon has 53 and the Rio Grande has 291.

Table 10 lists the PSOCs occurrence by river segment and mile for BDD's SWPA and shows each PSOC rankings, including the level of control.

Table 10. PSOC Inventory and Risk Rankings for the BDD SWPA

	Control ²		S	SC	NC	٥	<u>□</u>	<u></u>	<u>Q</u>	NC		NC	NC NC	NC NC		Ω	۵	<u>□</u>
	ပိ											_		_				
	Risk		Very Low	Very Low	Low	Very Low	Very Low	Very Low	Very Low	Low		High	Low	High	Very Low	Very Low	Very Low	Very Low
Impact to	PWS		Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant		Significant	Minor	Significant	Insignificant	Insignificant	Insignificant	Insignificant
Probability	of Impact		Unlikely	Unlikely	Possible	Unlikely	Unlikely	Unlikely	Unlikely	Possible		Likely	Unlikely	Likely	Unlikely	Unlikely	Unlikely	Unlikely
A ¹ or	2 -	River	∢	⋖	<	∢	Ъ	Д	Д	∢		∢	۵	∢	۵	۵	Ъ	۵
Number of	Occurrences	Rio Grande River	~	2	က	_	3	2	3	-	1	ო	-	_	1	21	6	•
	PSOC Description		Ephemeral stream	Ephemeral stream	Ephemeral stream	Buckman Direct Diversion Project	Private domestic well	Private domestic well	Private domestic well	Ephemeral stream	1	Ephemeral stream – Los Alamos Canyon confluence	Primary road, highway, or arterial	U.S. DOE LANL - Stormwater	Private domestic well	Private domestic well	Septic system	Private domestic well
PSOC	Code		Arroyo	Arroyo	Arroyo	NPDES permit	PDW	PDW	PDW	Arroyo	I	Arroyo	MRP	NPDES permit	PDW	PDW	RSF	PDW
	Zone		В	ပ	۷			В	O	۷	None	4			В	ပ		ပ
River	Mile		500ft- 0		0–1					1–2	2–3	3-4						4-5

 $^{^1}$ "A" for active and "P" for potential 2 "D" for direct control, "ID" for indirect control, and "NC" for no control

	1																					
	Control	2 S	₽	N N	₽	₽	S	S	Ω	₽	N O	S	Ω	₽	NC	S	0	Q	SC	О	₽	SC
C	Very low	Low	Very Low	Low	Very Low	Very Low	Low	Low	Very Low	Very Low	Low	Low	Very Low	Very Low	Low	Low	Very Low	Very Low	Low	Very Low	Very Low	Low
Impact to	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant
Probability	Unlikely	Possible	Rare	Possible	Rare	Rare	Possible	Possible	Rare	Rare	Possible	Possible	Rare	Rare	Possible	Possible	Rare	Rare	Possible	Rare	Rare	Possible
A¹ or	L	<	۵	⋖	۵	۵	A	Α	Ф	۵	A	∢	գ	۵	A	¥	۵	۵	A	Д	۵	∢
Number of	4	-	_	-	12	09	1	1	2	1	1	_	10	38	-	ဇ	7-	1	1	1	9	က
DSOC Description	Septic system	Ephemeral stream	Private domestic well	Drainage canals, ditches, or acequias - unlined	Private domestic well	Septic system	Ephemeral stream	Ephemeral stream	Private domestic well	Septic system	Drainage canals, ditches, or acequias - unlined	Ephemeral stream	Private domestic well	Septic system	Drainage canals, ditches, or acequias - unlined	Ephemeral stream	Septic system	Septic system	Ephemeral stream	Private domestic well	Septic system	Ephemeral stream
PSOC	RSF	Arroyo	PDW	ADC	PDW	RSF	Arroyo	Arroyo	PDW	RSF	ADC	Arroyo	PDW	RSF	ADC	Arroyo	RSF	RSF	Arroyo	PDW	RSF	Arroyo
Zone		<	В	O			∢	В			U				∢			В	ပ			∢
River		5-6					2-9								7–8							6-8

ķ	2																				
	Control ²	NC	₽	₽	₽	Ω	NC	Ω	₽	₽	Ω		₽	₽	NC	S	NC	NC	₽	₽	NC
	Risk	Low	Very Low	Very Low	Very Low	Very Low	Low	Very Low	Very Low	Very Low	Very Low		Very Low	Very Low	Very Low	Low	Very Low	Low	Very Low	Very Low	Very Low
	Impact to PWS	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant		Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant
	Probability of Impact	Possible	Rare	Rare	Rare	Rare	Possible	Rare	Rare	Rare	Rare		Rare	Rare	Unlikely	Possible	Unlikely	Possible	Unlikely	Rare	Unlikely
	A¹ or	∢	۵	۵	Д	۵	∢	۵	۵	۵	∢	anyon	۵	۵	4	∢	∢	4	۵	۵	4
	Number of Occurrences	1	2	20	-	_	1	6	90	_	7	Los Alamos Canyon	-	21	-	-	-		~	<u>_</u>	-
	PSOC Description	Drainage canals, ditches, or acequias - unlined	Private domestic well	Septic system	Private domestic well	Septic system	Ephemeral stream	Private domestic well	Septic system	Cement/concrete plant	Leaky underground storage tank site – Kokoman Discount Liquors		Private domestic well	Private domestic well	Primary road, highway, or arterial	Ephemeral stream	Primary road, highway, or arterial	Ephemeral stream	Underground storage tank facility - Totavi Phillips 66	Septic system	Primary road, highway, or arterial
	PSOC Code	ADC	PDW	RSF	PDW	RSF	Arroyo	PDW	RSF	201	СНС		PDW	PDW	MRP	Arroyo	MRP	Arroyo	CSS/CF B	RSF	MRP
	Zone	O			മ		ပ			4	ပ		В	ပ		4		∢			В
	River				9–10						10+		34			4–5		5-6			

Control ²	NC	S	NC	SC	NC	NC	٥	۵	N N	۵	۵	SC	NC		Ω	NC	NC	
Risk	Very Low	Low	Very Low	Low	Very Low	Low	Very Low	Very Low	Moderate	Very Low	Very Low	Low	Very Low		Very Low	Low	Moderate	
Impact to PWS	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Significant	Insignificant	Insignificant	Insignificant	Insignificant		Insignificant	Insignificant	Significant	
Probability of Impact	Unlikely	Possible	Unlikely	Possible	Unlikely	Possible	Unlikely	Rare	Possible	Rare	Rare	Possible	Unlikely		Rare	Possible	Possible	
A¹or P	<	∢	<	∢	∢	∢	۵	۵	∢	۵	۵	A	A	yon	۵	∢	∢	
Number of Occurrences	-	-	-	2	2	2	~	-	2	4	1	1	2	Guaje Canyon	_	2	-	
PSOC Description	Primary road, highway, or arterial	Ephemeral stream	Primary road, highway, or arterial	Ephemeral stream	Primary road, highway, or arterial	Ephemeral stream	NMDOT Los Alamos Patrol Yard Seasonal	NMDOT Los Alamos Patrol Yard Seasonal	Polluted surface water source (Impaired Stream for aluminum, gross alpha and PCBs: Los Alamos Canyon, Pueblo Canyon)	Private domestic well	Septic system	Ephemeral stream	Primary road, highway, or arterial		Private domestic well	Ephemeral stream	Polluted surface water source (Impaired Stream for Aluminum: Guaje Canyon)	
PSOC	MRP	Arroyo	MRP	Arroyo	MRP	Arroyo	CFA	CFB	MPW	PDW	RSF	Arroyo	MRP		PDW	Arroyo	MPW	
Zone	∢	٧		В	∢	ပ						ပ			4	∢		
River	2-9	2-8			8-9							9-10			29	2-9		

	應			50				
PSOC PSOC Descri	PSOC D	escription	Number of Occurrences	A' or	A¹ or Probability P of Impact	Impact to PWS	Risk	Control
Arroyo Ephemei	Epheme	Ephemeral stream	-	⋖	Possible	Insignificant	Low	NC
PDW Private domestic well	Private don	nestic well	1	Ъ	Rare	Insignificant	Very Low	Ω
Arroyo Æphemeral stream	Ephemera	l stream	က	٧	Possible	Insignificant	Low	NC
Arroyo Ephemeral stream	Ephemera	ıl stream	2	A	Possible	Insignificant	Low	NC
Arroyo Ephemeral stream	Ephemera	l stream	က	٧	Possible	Insignificant	Low	NC

Table 11. PSOC Occurrence by River Segment

PSOC* Type	Count	Percent
Rio Grande R	River	
ADC	4	1.4
Arroyo	22	7.6
CHG	1	0.3
ICC	1	0.3
MRP	1	0.3
NPDES permit	2	0.7
PDW	69	23.7
RSF	191	65.6
Rio Grande River total	291	
Los Alamos Ca	anvon	
Arroyo	8	15
CFA	1	2
CFB	1	2
CSS/CFB	1	2
MPW	2	4
MRP	9	17
NPDES Permit	3	6
PDW	26	49
RSF	2	4
Los Alamos Canyon total	53	
Guaje Cany	on	
Arroyo	11	73.3
MPW	1	6.7
PDW	3	20.0
Guaje Canyon total	15	

^{*}See Table 8 for PSOC code descriptions

8. Managing for Source Water Protection

The purpose of NMED's Source Water Protection Program is to protect drinking water sources before they become contaminated. The most significant PSOCs for the BDD are LANL legacy contaminants, NPDES discharges, sediment transport, and wildfires.

Wildfires affect the type and quantity of nutrients (especially nitrogen) in the river, as well as the turbidity and TSS entering surface water sources. Wildfires can also impact the rate of runoff and sedimentation into surface water sources.

Storm events in the upper Rio Grande watershed lead to increased turbidity at the BDD intake. Because the high sediment content in the raw water can cause serious damage to the BDD equipment, diversions are stopped during periods of high turbidity. There is not a pre-determined turbidity threshold at which diversions are ceased; rather, the Operations Superintendent monitors river turbidity daily to balance the need to supply water to customers with the need to protect equipment life. In the past, high sediment loads have led to shutoff periods ranging from one hour to three months.

LANL legacy contaminants are transported to the BDD intake mainly via suspended sediments. This characteristic makes these contaminants likely to be transported downstream to the BDD during storm events, but their strong sorption to sediments allows them to be treated by the BDD treatment technologies. The BDD currently conducts extensive monitoring of the source water for legacy contaminants from LANL. This practice is comprehensive, should be continued, and provides significant protection to customers.

NPDES (includes WWTPs) and groundwater discharge permit holders discharge effluent into waterways. These permit holders must meet all state and federal effluent water quality standards. Pharmaceuticals and personal care products, however, are currently not regulated and monitored and can be hard to treat due to their solubility properties. Given the size of the Rio Grande, these contaminants are likely to be strongly diluted before reaching the BDD intake.

8.1 Specific Sources of Contamination

The potential and actual contamination sources with the highest risk (high and moderate) listed in Table 10 are summarized below along with proposed remediation efforts and strategies to mitigate or prevent contamination.

Epi	U.S. DOE LANL – Stormwater, NPDES Permit hemeral stream – Los Alamos Canyon confluence, Arroyo
Risk	High
Source Affected	Rio Grande River watershed – affected directly
Contaminants of Concern	Turbidity, radionuclides mostly alpha and beta emitters, gross alpha/beta, metals, organics mostly PCBs (see Section 7.2.1)
Issues	Discharges from Los Alamos canyon during storm events will mobilize and transport any contaminants (legacy and wastewater facilities) settled in the low Los Alamos canyon into the Rio Grande. The legacy contamination has been documented for decades, and the discharges of storm water containing the contaminants has been documented by NMED and BDD over the last 20 years.
Concerns	Stormwater from Los Alamos watershed will discharge into the Rio Grande and will contaminate the raw water which is the source of raw water for BDD intake at the river. Neither BDD nor any other entity has any control over the frequency or strength of the storm events in nature.
Strategies	

Polluted surface water source (Impaired Stream for aluminum, gross alpha and PCBs: Los Alamos Canyon, Pueblo Canyon)	
Risk	Moderate
Source Affected	Los Alamos watershed (Los Alamos and Guaje canyons) – affected directly Rio Grande River watershed – affected indirectly
Contaminants of Concern	Turbidity, radionuclides mostly alpha and beta emitters, gross alpha/beta, metals, organics mostly PCBs (see Section 7.2.1)
Issues	Contaminated sediments will be settled into the canyon beds and may be mobilize by stormwater to reach the Rio Grande. Not all stormwater may reach the Rio Grande.

Discharges from Los Alamos canyon during storm events will mobilize and transport any contaminants (legacy and wastewater facilities) settled in the low Los Alamos canyon into the Rio Grande.
Los Alamos canyon into the Rio Grande.
Stormwater from Los Alamos watershed may discharge into the Rio Grande and may contaminate the raw water which is the source of raw water for BDE intake at the river. Neither BDD nor any other entity has any control over the frequency or strength of the storm events in nature.

8.2 General Action Items

Based on NMED guidelines and the conclusions from this evaluation, BDD would adapt the following general management practices as part of its Source Water Protection Program:

- The Source Water Protection Team would meet annually to review the State's Source Water Protection EnviroMap, PSOCs within the delineated SWPAs, and any changes to the system's sources.
- The Source Water Protection Team should participate as necessary in regulatory meetings and hearings on facilities within the SWPAs.
- This SWPP and the map of PSOCs will be updated on an annual basis; or as changes occur.
- As the members of the Source Water Protection Team change over time, the new members would be informed of the plan and its implementation actions.

- ♣ BDD will continue surface water monitoring and sampling efforts related to LANL legacy contaminants.
- BDD will evaluate on a regular basis the ENS and BDD system of gages in the Los Alamos watershed to determine if any additional gaging stations are needed to provide more accurate information on flows potentially carrying LANL legacy contaminants to the Rio Grande and BDD intake.
- ♣ Given that turbidity levels in the Rio Grande can cause the BDD to cease diverting for significant periods of time, BDD may consider additional sediment removal options and methods for clearing sediment from intake cells.
- ♣ BDD would initiate communication with upstream NPDES, WWTP and groundwater discharge permit holders to discuss notification procedures and emergency plans in case of a major contamination event.
- The BDD intake is on U.S. Forest Service (USFS) land, and public access cannot be restricted. BDD would continue to contract private security and work with USFS to ensure the protection of the intake structure and pump stations from public tampering and vandalism.
- ♣ A public information program could be developed related to source water protection. This program would educate the public about BDD's water sources, potential threats to those sources, measures that the public can take to protect sources, and means to 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.

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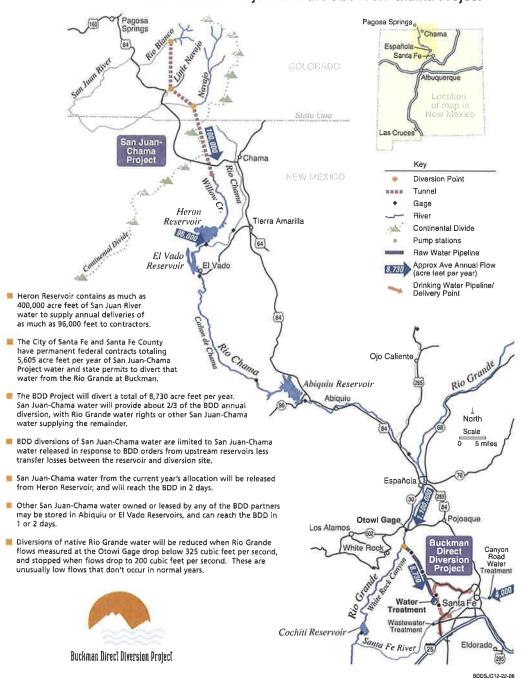
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Appendix A BDD System Information

Buckman Direct Diversion Project and the San Juan-Chama Project



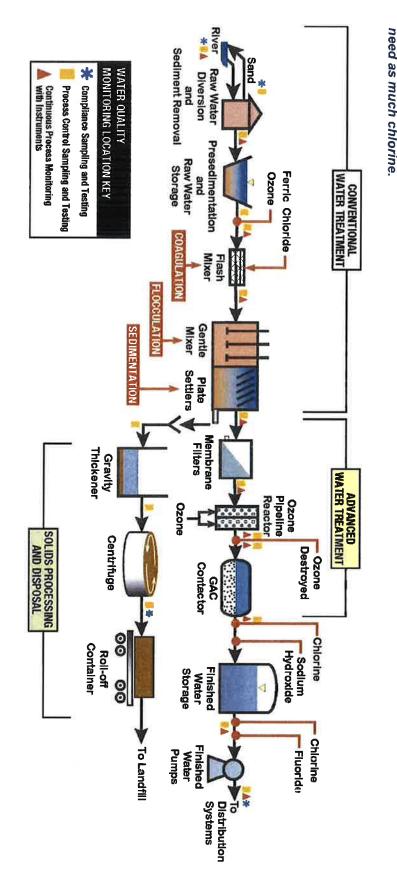


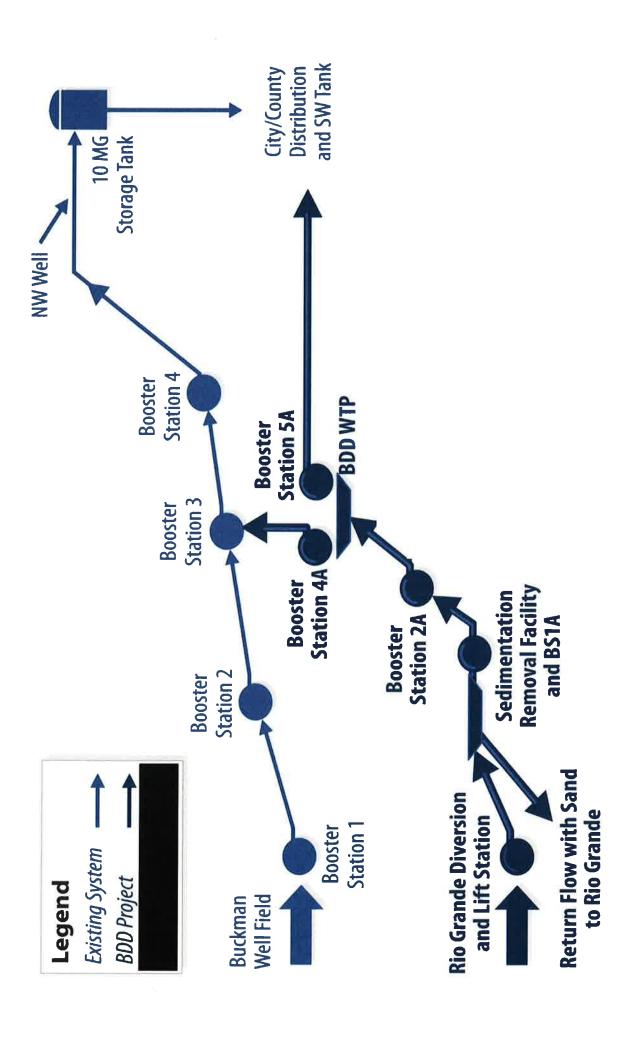
Buckman Regional Water Treatment Plant Processes

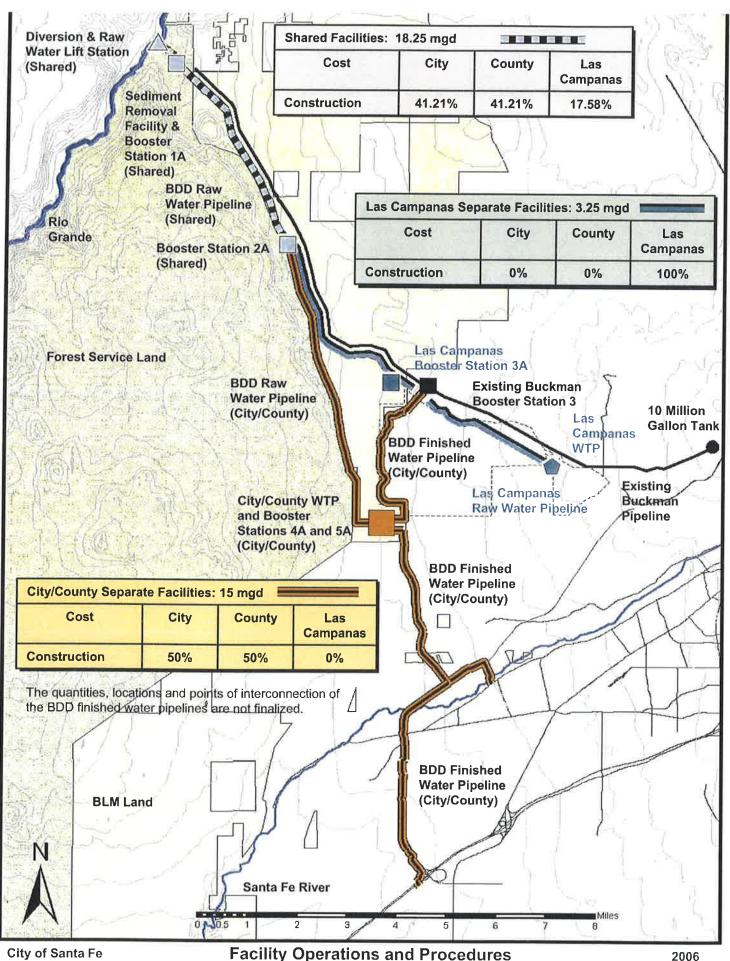
Buckman Direct Diversion

polishing of the finished drinking water. conventional processes remove the vast majority of contaminants. The advanced processes provide additional treatment and The Buckman Regional Water Treatment Plant includes a series of conventional and advanced water treatment processes. The

activated carbon contactors. Disinfection is accomplished with lower amounts of chlorine because the high-quality water does not improves the effectiveness of conventional treatment. Advanced treatment is provided by membrane filters, ozone and granular Conventional treatment processes include coagulation, flocculation, sedimentation and disinfection. Raw water ozonation







Santa Fe County Las Campanas LP

Facility Operations and Procedures Agreement Exhibit A **Buckman Direct Diversion Project**

Appendix B

City of Santa Fe Consumer Confidence Reports

Why are there Contaminants in

my Drinking Water?

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Microbial contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife. Inorganic contaminants, such as salts and metals can be instrutily-eccurity or result from whan storm-water runoff, inclustrial or domestic water-air discharges, oil and gas recoluction, mining or farming.

Pesticides and herbicides, may come from a variety of sources, such as agriculture, urban storm-water runoff, and residential uses.

Organic chemical contaminants, including symbolic and while togethe chemicals, are by-products of infustrial processes and perfortent production, and can also come from gas stations, uthors storm visiter mood, and septic systems.

Radioactive contaminants, which can be naturally covering amountain from the mospheric disposition from former above ground existing or he the rosult of oil and gas preduction and mining activities.

In order to ensure that tap water is safe to drink, EPA pre-serbas regulations that limit the amount of cartain centami-uarts in water provided by public water systems. Food and Drug Administration (PDA) regulations setalists in mits for conductions in builde water, which must provide the same protection for public health.

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Voluntary Monitoring

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cket	bbw	=	W	2815
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Tatal Haloacetic acids.	mild		B.0094	2015
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dines	mostet		31	2015
	Cany	m Road W	11.	

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The City of Sunta Fe water system uses free chlorine as a disin-fectant. For the year 2015, sumpling was performed at 80 mont-toring locations each month. The results are summarized in the

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Ususpiling contaminant suminents by Exp. (SINNA)
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and December 2015.

Typical Source	Present of neurit deposit, Leathing for wood preservations Common of hydroles phonology systems	Corresson of household plumbing systems, Erosion of natural deposits
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The table on the following page lists contaminants which:

In lave associated primary Maximum Contaminant Jewek (MCLs) that are regulated and

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City of Santa fe 2015 Water Quality Table Regulated Compliance Monitoring

				Con Mind					į				
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1.1-Trichloroethane	qdd	200	200	0.1 040 - 0.15	2014	ON	2014	Q.	2014	ON	2014	S.	Discharge from metal degressing sibes and other factories
I. T. Dichloroethylene	qdd	1.0	4	629 (NO - 921)	2014	ON	2014	QN	2014	Q	2014	No	Discharge from influstrial chemical factories
2-Dichlorosthans	qdd	*	31870	078 (MD-920)	2014	CN	2014	QI	2014	Q	2014	S.	Discharge from Industrial Chemical
fetrachloroethylane	qdd		zaro	0.20 (ND - 9.28)	2014	QN	2014	Q.	2014	9	2014	N.	Gechange from testories and dry cleanury
Synthetic Organic Cont	taminanta				100								
Trylene Dibromide	qdd	50'0	Zero	700.0 (100.0 - GPI)	2014	9	2014	ě	23914	QN	2014	No	Discharge fram petroleum refineries
organic Contaminants													
rasmic	qdd	10	•	QN	2015	망	2015	Q	2015	9	2018	No	Engains of natural deposits; Hunalf from orchants; Runelf from glass, and electronics production waster.
and a	wdd	ē	*	(0.1 - 0.8)	2014	Q4	2014	QN	2014	QN	2015	No.	Discharge horn deliking wastes; Discharge from metal rethonoles; Emelon of natural deposits
printe	qdd	10	i.	Ą	NA	AN	NA	NA	Ą	123	2002	ž	Byproduct of drinking water disordedison
Drumben	qdd	100	100	(1-00)	2014	g	2014	ON	2015	ð	2013	ON.	Discharge from start and pulp mills; ecosion of natural deposits
Tueride	шdd	7.30	7	(0.14 - 0.16)	2014	0.4	2014	0,11	2015	0,37	2018	ď	Erosion of natural deposits, Water additive which gramolies strong desth; Dacharge from fertilizer and aluminum factories
[N 50]	ď	10	5	6.65 (3.03 - 6.65)	2012	0.18	2015	0.12	20.02	0.18	2015	No	Rungif from familizar use; Leaching from septic tanks, sewage; Crossen from salural deposits
adostine Contamina	ę.												
Aross Alpha Emitters	DC/I/L	15	0	03.60	2014	4.2	2014	9	2014	1.2	2014	ĝ	Ereston of natural deposits
Store Detail hoster	PC//L	*05	NA	1.5 (ND - 1.5)	2014	2.3	2014	114	2014	23	2014	No	Datay of natural and mon-mode deposits.
Sadium 228/728	pCi/L	**	0	0.77 (E18-0.77	2014	20.0	2014	0.18	2014	1.0	2014	No	Ereston of natural deposits
Peznium	qdd	я	0	2,0 (MD - 2,0)	2014	2.0	2014	ND	2014		2014	No	Eresion of natural deposits;
urfoce Water Cuntaminants	namts												
furbidity" (Highest	UTN	П*10	٠	NA	ΑN	AN	\$	0.33	2015	81.0	2015	ů,	Sod Renoft
unbidity finesss nanthly % mesting mits)	UTN	% <0.3 NTU		W	ž	A A	AN	100.0%	2015	100 D%	2015	No	Sed Haruff
Toci	ş	CHN-25%	Ą	1	ž	Ą	¥	53% to 64% removal	2015	ş	¥.	No.	Maturally present in the annicuries of

- Note: a) EPA considers 50 pCi/L, to be the level of concern for beta parietes.
 - Trichtild is a season of the continuous of work. We amonitor it because it is good indicator of the directiveness of cord filtration spentilled: Also, Agus Fria, Ferguson, Osage, Sania Fe, St. Mirkes, Criterion.
 Dispublished: Also, Agus Fria, Ferguson, Osage, Sania Fe, St. Mirkes, D. Buckman Weils 1-23 and Nurthwest Well.

Key to Units, Terms and Abbreviations

- NA: Not Applicable.

 ND: Not Detected.

 NTU. Sephelometric Thi bidity Units.

 Paper: Parts for infillior, or militgrant per litter (mg/L), ppb: parts for bidilion, or militgrants per litter (mg/L), ppb: parts for bidilion, or micrograms per litter (ug/L), ppb: parts for bidilion, or micrograms per litter (ug/L), ppb: parts for bidilion, or micrograms of militgrams per litter (water, mg/L. Number of militgrams of substance per litter (water, mg/L. Number of militgrams of substance per litter (water,
- Micrombookern Micromboo per centinotee or 185cm (microsiomiens per authorior) a messure or friethful moduli micro, in sain while to the presence of insufactive limitarité one (e.g., calcium, choride, sodium, etc.).

*Co units: Platinum-Cobalt color units – a measure of color also called the lazen % ale or "APIA color", as defined in ASTM International Standard D1209

L: Action level: The concentration of a contaminant, which, if exeueded, iggers treatment or other requirements, which a water system must follow. Range): The range represents the highest and low values. Range values are of provided if only one sample was taken during the range period.

And Lockshoot in mining armad were the previous of analytical results for managers. At a part of the mining armad were the previous of the previous of the managers. But set each sample because distinct most be fall because the contract of the previous of

Assumment underthinment in evel (M. L.). In highest two its ordering and when the many the many the present of the many that the best subtlicts the many that the best subtlicts the many that the many that the many the many that the many thas the many that the many that the many that the many that the ma

Secondary MCI, (SNOCL); Non-mardatory water quality standards for return tensiminates eachled held as guideless transes guidelis vester operation managing their directions varieties are satisfied considerations, such as states, coher and door. These contaminants are not considered to present a risk to human eachla at the SMCI.

2015 Water Quality Report

Map of Water Sources

The Coty of Element Dev Water Division (the Crop) is pleased of specified by water and any six with community water and permanent and any permanent and any permanent of the Crop. The report is provided annually and contains information on the quality of water designed annually and contains information on the quality of water designed water made and State Crop. The report of water designed water made and State Crop. The report contains and should be where quality milk. The report contains and should be deliberate quality milk. The report contains and show it to empares to estandards set by federal and set to explain the comparison, what it contains and thought on the comparison of the provides educational information for contaminants which may be a concern

SOURCES Of SUPPLY
The Cay, was eared by our illustrate assessment as the control of the control

In 2011, the Buckman Direct Devention (BDD) Project surface was a greatly was successfully integrated in the formulation of the control of th

Do I need to take special precautions: the conveyer was a new version and the conveyer was the new version to contain the state of the conveyer was the new version productor, lumino-the conveyer of the conv

Source Water Assessment and its Availability

The New Mooder Environment Department (NMLD)

Profits and the Committee of the Committee of Saint Profits and Saint Prof

City methaneses adopted in 2005, built upon the recommendations in the Source Water Assessment. The Scholar City of the Scholar and Source Water Protection and the Scholars (William Control and protections for the City appearant of the Scholars water proposed in the City and Scholars with the good of reducing pollution distributed to Storwards Program with the good of reducing pollution distributed to the State of Story Places acids 1955-2194 to report Heapt dismyling instrum theirs, students and stronges.

se información importante sobre la Santa Pe. Si tiene alguna pregenta o rte puede hablario a Victor Archaleta En Espanol
Este monte canisme intermedia
called of ingo at Sant Re. S. in

City of Santa Fe 2016 Water Quality Table

					-								
Contaminant	940	HEE	HELE	City and	ļå	þ	ļā	H	ji	ļ	11	##	Typical Season
Tongarie Contaction													
Į.	çdd	D.	•	•	2016	æ	2014	9	2016	2	2015	2	Freshon of natural deposits; Ranoff from orchants; Runoff from glass and electronics production wastes
- Parlem	E.	#	*	970	3016	2	2014	9	3016	9	2015	2	Discharge from drilling wanter, Discharge from metal refinerlas; Enadon of natural deposits
, this or	î	<u> </u>	E	5	2	M	ž	Ä	¥	1.7 (ND - 4.7)	2016	2	Pyproduct of drinking water disinfection
Oironsteam	1	100	š	9	2016	<u>e</u>	2014	Q.	2016	=	2016	2	Discharge from steel and pulp milis crosson of natural deposits
Buaride	ı	•	•	6170	2016	P4	2014	6.13	2816	0.28	2016	2	Erozion of natural deposito; Water additive which promotes abung teeth; Discharge from register and a second factories
Werate [as H]	84	<u>e</u>	•	7.15 (2.95 - T.15)	2016	170	2016	9	3616	2110	2016	S.	Rusoff from fertilizar use; Leaching from septic tasks, sensign, frences from natural deposits
Indianctive Contaminums	Ų,												
Gross Alpha Endstors	PG.	918	۰	4.4 (1.9 - 4.4)	2014	17	2014	9	2014	7	2014	2	Erwinn of satural deposits
Gross Bets/Photon Envictors	Ř	50+	2	51 (61 - 00)	2014	23	7014	3	2814	ដ	2014	2	Decay of natural and man-made depocies
Bedum 226/238	POA	•	•	7,0 - 01.0)	2014	10,0	2014	873	2014	3	2014	ž	Erosion of natural deposits
Brankon	g.	30	۰	2.0 (MD - 2.0)	2014	1.0	ZD14	₽	2014	1	2014	2	Erosion of natural deposits
Serface Water Contaminants													
Turbidley* (highest single mezsurement)	Ē	П= 1.0		Ä	2	¥	2	27	2016	0.29	9102	2	Seil Rumoff
Turbidity* (lowest monthly % meeting limits)	NTU	π <0.3 ¥π	۰	5	2	1	ā	100%	3016	100%	2016	2	Soil Runoff
Terzel Organic Carbon (TOC)	ž	145%	1	1	≨	#	ź	2 X3	2916	¥	ž	ž	Naturally present in the environment

- W-W-W-

s EM considers Sú pCú, so be de level of conclen for hear particles. Radicham Wells 1:13 and bestheren Well Radicham Wells 1:13 and the freeze Consideration Cape, short for K. Mass 8 formers C. Dey wellschaft, Agen for the reconfines of messacy Ne mexican R. Westure it a 1 good indicator of the effectiveness of our filtration system.

Key to Units, Terms and Abbreviations NA: NotApplicable.

TO: Nepokamaric Tarbidity Unita.

TO: Nepokamaric Tarbidity Unita.

plus parts per million, or milliogram per liter (mg/1),

plus parts per Billion, or micrograms per liter (mg/1),

G/Lz piccouries per liter (a measure of radioachrity).

g/Lz Number of micrograms of substance per liter of varer.

Rangel: The sampe represents the highest and low values. Bange values from general the highest and low values. Bange values are supervised all only one sample was believed from general.

Lz Action level: The respectation of a constantiant, which if exceeded, starts treathered or other requirements, which a value system must follow.

te Locational running animal average—the average of nashybeal of sea seque as the searchest of sea seque and during the previous alendar quarters. LRAA at each sempling location must be below the code may Lear Total Haloscette Adds and o oso may Lear Total

attainment Centrationare Level (640). The highest level of a naturalment that it allowed in clinicists where NoCl are not an else to MCL are if stable using the best reveilable treatment technology. Action Contaminant Level Gene (MCLO). The level of a naturalment in relating water observability to be present a supported actionment in relating water observability to state. The technology of actions Remained The Heart Contamination of the contamination of the action of Remained Theorems (MCDLO). The highest level action of Remained in challing water. There is contamining orderince at addition of a feative feature of the contamining orderince at addition of a feature contamination.

process intended to reduce the leve a Residual Disinfectant Level Goal (MRDLG) – The rinking water disinfectant below which there is no known or about the bush MRDLGs do not reflect the benefits of the use of is to control microbial contaminants.

I need to take special precautions?

Some poople may be more vulnerable to contaminate in driaking water than the caperal population, Immore-compornance presents such as presents with a tracer undergoing demodrary, persons who have undergoing demodrary. Persons who have undergoing demodrary, persons who have undergoing or oppart transplants, people with HIVA/AIDS or other immune system disorders, some elderly, and infants on the particularity at risk from infections. These people wholl uses after a board driaking water from that health care providers. ENA/Centes for Desease Control (CIVC) guidelines on appropriate manss to lessen the risk of infection by Cryptospardfarm and other nucleotide occurring the resident or the risk of infection by Cryptospardfarm and other nucleotide occurring an eventual providers. EVA/Centes for Desease Suf- Evaluing Water Herline (800-426-4791).

2016 Water Quality Table Report

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Sources of Supply

The New Mester Enriquentual Department (NAED) confided a Soure Vider Assessment polarite Gyr Overstan Fe. This assessment induced a defermination of source visit in Fe. This assessment induced as defermination of source within the rares of concern. NAIDs concluded. The Susceptibility Analysis of the Gir O Stan Fe water utility is and the sources of diffusity water are generally protected from potential sources of contamination leade on an evaluation of the weighbe information. The susceptibility rank of the entitle water system is "Inducated by low." A copy of the Assessment is wailable by contacting NAIDs at [606] 479-6893. The City was severed by four distinct soutcess of snapply and 2004. The Tytoon sees Stand is Waterharde growdes surface runefl to the Stand is Waterharde growdes surface runefl to the Stand is Vester where it is stored in the Worders and Alfolodis Research prior to tearment, Surface Water from the Stand Pe Rover and Bio Grandle is treated in the Caryon Road Water Tearment Plant and Buchman City Well Friedd is mostly located in door governing to the Stand Pe Rever and consecting the Land House of Stand Pe Rever and consecting the Stand Per and consecue of its arrive which for the City Ilmits of Stann Fer The Buchman Well Friedd cornsists of a given with the City Ilmits of Stann Fer The Buchman Well Friedd consists of the Stand Per approximately the City Ilmits of Stann Fer The Buchman Well Friedd consists of the Stand Stand Stand Per City Ilmits of Stann Fer The Buchman Well Friedd consists of the Stand Stand Conference of concurrence approximately the City Ilmits of Stand Per City Ilmits of Stand Fer Andread Conference of concurrence approximately the Conference and ormanuly so recommended by politic Wellip professionals. In 2011, the Buckman Direct Diversion (IDD) Project surface in water apply were successfully integrated to the huminish of city's pre-valued and operated to conjunction with the City's pre-value sources of angley throughout 2016. The resystem control of the RRYTE is taken directly from the Kit Grand, EDD to the Operation of the Signature of the

Water Assessmeni

Source

and its Availability

Contacts for Additional Information

If you have any questions, comments, or suggestions regarding this report please contact Alor Puglid at (505) 955-4232 or write to the above address.

*

City ordinates adopted in 2008 built upon the recommendations in the Source Water Accessment. The "Safe Driving Water and Source Water Protection" and the "Sources Third to Bakergo Courto' ordinates provide additional controls and protections for the City's ground and such events applied in addition, the City and and such as a support the proper place country (Sage Safe Authority of the City of the En Español – Rate reporte continue informaedon importante sobre la cultuda del agua en Santa Pe. Si teres aguan pregante a chada sobre este reprete puedo habitante a Partirio Pedesco al baldano (545) 955-4225.

Why are there Contaminants in my Drinking Water?

The driuking water standard for arrearis is to pg/L. The City's dribking worter standard by one the list standard throughout 2016. Assertic occurs annually in the earth's cruet. When these mensic-containing eachs, amenical, and soft could, they release uncerticities ground water. While our clinking water mests EPA asharded behaves the current understanding of assentic. The EPA standard balances the current understanding of assentic and configuration of assentic and configuration of assentic the clinking water. EPA containes to research the health effects of drive for the configuration of a name of the configuration of a name of the configuration of the cause concern in humans at high concentrations and is linked to other health effects such as akin demange and circulatory problems. Source of chicking water (but to paster and bothed water) include trees, labes streams, postle, reservant, a printe, and well as water treed, rever by service of the laid or through the ground; it discovers naturally recurring infineths and, in some cases, redisorder naterial, and can pixel as passamen requiring control the preserved waiting to far to be laissamen. Outstanding in offishing water may include:

Microbial contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife

Microbial and Disinfection

Byproducts Rule

Inorganic contaminants, such as salts and metals can be marinly-occurring or result from urban storm-water muoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.

Pesticides and herbicides, may come from a variety of sources, such as agriculture, urban storm-water ranoff, and

Organic chemical contaminants, including synthetic mod volstile organic chemicals are by-products of instartial processes and pertoleun production, and can also come from gas stations, urban storm water ruooff, and supic Redioactive contaminants, which can be naturally occuring, man-andel from holder facilities and strongpheric deposition from former above ground festing, or be the result of oil and gas production and mining activities.

In order to ensure that up water is safe to drink, EPA prescribes regulations that little the ensured of vertain containments are provided up public water spersons. Food and Druy, Administration (PDA) regulations establish limits for contaminants in bottled water, which must provide the ameroposedion for public health.

Nitrates

(TRUM) 1 = certic are poer (explit) 1 = Justicianists seems as all locations infants of less than six months of age. High nitrate levels in high aware on mane blue bub syndrome. Nitrate levels rise questy for along periods of time because of rainfall or others and stricts. If you are certag, for an infant you should City of Santu Fe drinking water meets the federal drinking water standard of to ppm (or nitrates (10 mg/L as.y). Mirates have been detected in some of the City Wells up to 7.45 ppm. Mirate in drinking waters the levels above, to ppm is a health to id.

Arsenic

The Sage 2 DBPR also regulates the movimum realdaul for disinfectures; their dedicated free chroms and charantimes. The distinfectuals are water saddlives used to control armonograms, particularly as a readual distinfectual in distribution system pipes.

The City of Santa Fe water system uses free chlorine as a desintedant, bot the year 2016, sampling was performed at 80 monitoring locations each month. The results are summarized in the table below:

Cryptosporidium

Cryptospareldum is a protozum parasite that is common in surface waster. The coops is the transmission stage of the organism. Cryptospareldum is introduced into our source waters in which animal populations. Although the organism is really removed by the conventional treatment process utilized as the Chopin Read Wister Treatment failify, the oocyst is resistant to chemical disinferents like shorten and the primary reason to determine it additional treatment is required. Ingestion of Cryptospareldium may cause explicaçon distribution. The Microbial and Disinfection Psycoducts (M/DBP) Rules are a set of interesticing regulations and address risks from microbial puthogens and disinfections, disinfection by Products (1989-1). Reg. 2 Disinfections and Disinfection by Products (1989-1). Reg. 5 Disinfection and Principles and Disinfection by Products (1987-1). Reg. (1987-1). Reg. 2 Disinfections and Disinfection by Intuition grown to Disinfection (1987-1). Reg. (1987-1). Re

In April 2007 the City began a two-year study to determine the average Chygosporfolme naturation in source water energing the Canyon Road Water Treatment facility. The sampling profits of the study was completed in March of 2004, The study is part of the requirements commissed in the 2004 USEA Lang Year Bhanced Sulface Water Teatment Rule. Chygrospordium was detected in a single untreated sample in each of the following months: Documber of 2007, September 2008 and October 2006. The highest tra-month consecutive metal for this study was not along once; Since the concentration is co.077 occysts/1. no additional treatment at
the Caspon Road Mare Transment Pacify was necessay. The
City began a second round of ampling, one sumple a month
saturing in Chother arough and scheduled to one in September
207; No Cryptosegoridium coopies have been detected since
moniforing began in October 2015; though December 2016.
As with Cryptospordium coopies, no offormin Lamblia cysts
have been deceated in the same time privod. The City of States Fe system has eight compliance sampling locations, for TTRA and Mack, Each locations is sampled once per quarter. The average of enabytical results for DBFs at a given location during the previous bour quartert, samples is called the locational running, annual average (LRAA). The LRAA area chalcacion mayer behow the McCi (coop ong, Lior (HAA) and to odo mg/L for "THAM) Results shown in the Table holow inclines that the individual quartery cubes; during 2016 ranged from coon to cacyo mg/L for TTHAM. The highest ICAA was to cook to o on an one and to cary mg/L for TTHAM, indicating that the system is in compliance.

Typical Sec-Range 2016¢

HELP POLICE TO

Mascerie 0.060 NA 2014 0.0243 3.0014 E-0342 12 TOBO NA 2016 0.8547 M.D.Man Leadle

Any new voter system treating audient water such as BDD is required to monitor. Organoporishmic red a consonative monitor. At the BDD the untrasted raw Ro Grande water Organoporishm net results that the Organoporishm range from to e4 cosystell. BDD began a second round of simpling, one sample a monitor surface, to Coober 2019, and Schedulckie and in September 2017, Chypinoporishm rocysts were only detected in our of detection was a 1 nonyety.

Unregulated Contaminant Monitoring Rule ('UCMR)

LPA uses the Unrayaluted Contominant Monitoring Mule (UCMR) to orderle date in containmant but are assigned to be present in direllating water and on on there has lib-based standards set under the Sic Dribning, Wither Act (SDWA). Unregulated ourtainmant mouthering legls EPA to determine where certain containmants occur and whether the Agency should consider regulating those containmants in the (turne UCMR sampling for the EPA required four quarterly periods was completed in the Samo Fe water system between March and December 2015.

Pre servage of all of the monitoring results and the range of detections for an elected investment contaminates for what state or relevant male require monitoring use transcriptions are presented in the Other contamination with a manager and an extensive presented an investment by EPA, but they wave not found start of the other contaminations are presented in the above the other contamination and therefore turn not included in the above thele:

1	1		Park	Runge 2016
		and streets	Lon	Rep
A-Diosine	E	0.068	0.078	CE0 0
Chimete	g k	127	រា	389
Chromben	â	27.0	277	2
Hezerates Oromism Dimetrod)	£	9.49	0.03	6
Halyledenum	12	210	171	2
Strootlam	10.	164	35	436
Passaline .	9	2.9	28	6.0



Lead and Copper Rule

If present elected levels of lead on cause sections health problems, especially for preparant women and young children. Lead in detailing water to periodically manufactured and compensate associated which service lines and horse planning. The City of Statu Fe's is responsible for provided by quality distribute water. But example the workey of materials used in planning components, it supposed for provided the policy quality of uniquing water, but example control the variety of materials used in planning components. For example, the control house, you can minimate the potential of lead proposure its faithfully quality for example If you are commerced about lead in your water, you may wish to the you water short information on healt in distribute water expense is on they you water the committee opposure as employed from the Science of the distribute water proposure is employed.

Tests for lead and copper are taken from customer taps located throughout the City once every three years. The mast revent round of lead and outper testing to hope the August 2012, the next survey will be performed in 2018. If present, cleonaid levels of lead can cause serious leadth professer, especially for a preguant wemen and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing.

Complete Complete	Erokon of extornal deposites, Leaching frees seriod preservatives; Corresion of focumbods phombing systems	Corroctes at baunchold plumiding systems: Ermion o natural deposits	Machine of enotoring on used to documen the commontaine at the 19th potential hapful fill documentained the concentration of the Pilophote tamper. We see the third subject and back the common of the
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jı	Augent 2015	August 2015	Consider (e.g.
Call. Date M	30 of 30	30 of 30	o at the POth po meadle is the 2
Cley Winter Levels (980) Percentiby	99 0	0.0023	llaufte of residualty are used to determine the temastradre at the 19th processit (e.g. if 10) tempte rail Bland on the member of wangles madrated in 2015 the 19th processits in the 21th swaps his cappar and band. It is known best
AL. **	2	0.015	to determine en enabyted
MCLG	2		and to the
Intergrade Contaminant	Capper (Ispec)	(mdd) pers	Stanfa of creeks Based on the mon

Monitoring for LANL-derived contaminants

In corporation with Los Alamos National Laboratory (LANL) and the New Mexico Environment Department, the City currently mentions better the Mexico and a supervised better Samples are supported for produced the mentions better and while high explosive and expanies. This typest sampling has excurred during the years 2001 – 2005 and has included during the years 2001 – 2005 and has included the Laboratory-derived antiometries are not present in the Buchaman Wells, i.e and 81 The results do indicate detectable levels of relationship with a total and a laboratory-derived antiomatical survival. These wells are to off the Laboratory-derived antiomatical survival. These wells are part of the 13 wells that make-up the Buchama Wellfield, When these wells are used, water from these wells is delivered to the Buchama Trite prior to distribution into the system.

2016 City of Santa Fe Water Quality Table

The table on the following page lists contaminants which!

I have associated primary Maximum (Contaminants Levis (MCI4) that are regulated and

I) have associated primary Maximum (Contaminants Levis (MCI4) that are regulated and

I) were detected in testing another that the contaminants leving the contaminants and the contaminants.

The test believed evolut stoce constitutes found how effection limits diving not to sharp into the content into an analyzed during 2016. He EPA required monitoring for extent in contaminants level than two express the concentrations are not expected on two spills and the volt may form year to sear the EPA required to test for over 80 contaminants, and the volt may form year to sear the expected to wear find that the state of the contaminants and contaminants are contaminants. The presence of these contaminants does not moneyment that were also also to contaminants the presence of these contaminants can be contained and to describe the ventor out that the form of the contaminants and potential better described to the presence of the presence of the secondariants are purely to the presence of the secondarial register of the secondari

Please view separate City of Santa Fe 2016 Water Quality Table

Why are there Contaminants in my Drinking Water?



Microbial contaminants, such as viruses and bacteria that may come from sewage treatment plants, septie systems, agricultural investock operations, and widdlife.

Inorganic contaminants, such as sails and metals can be maintails centuring or result from urban storm-water runoff, industrial or dementic water-rain discharges, oil and gas production, mining or familie.

Pentades and herbicides, may come from a variety of source, noth as agriculture, urban storm-water runoff, and residential uses.

Organie chemical contaminants, indudug syubnic and delinie optate chemicals, are by-produsts of industrial processors usy petroleum production, and can also onne from pas stations, urbas soom water most, and say by systems.

Radiosetive contaminants, which can be naturally occurring man-ands from indear facilities and atmospheric obcounted from former above ground testing, or be the result of all and gas production and mining activities.

In order to ensure that tap water is safe to drink, EPA pre-scribes regulations that limit the amount of certain contami-anness in water provided by public water systems. Food and Drug Administration (FDA) regulations extablish limits for estimatants in bettled water, which must provide the same protection for positic health.

Nitrates

Gity of Santa Pe drinking water meta the federal drinking water attached of 10 ppm for nitrates (10 mg/L as N). Nitrates have been detected in some of the City Wells par Drygon. Nitrate in definition water at

is to poin is a boath, risk for infants of less than
the R. High infants levels in diricking water can
bady synchrone. Nitnes levels may rise quickly
vivok of time bocuse of rainfall or agrecultural
vivoks of time bocuse of rainfall or agrecultural
walls care corneg for an infant you should ask advice
walls care provider.

Arsenic.

The definition water standard for arenie is so parl. The Chy in the definition water cardiard for arenie is so parl. The Chy in the definition water continued to meet it this standard throughout an enterior-candinate rocks, mercent has led since the forest amend into ground weter. While one thritting water mease Erv. attended for a sense, it the contain to be redeed of amend. The parls hash define as the current meanments of a sense in parls hash define as the control meanments of a sense in the control of a minoral known to cause causer its human as thigh conservation and is landed to other health effects of the land of the control of the lander of the water is the man as the conservation and is induced to other health effects with a said can direct substitution by the control of the beath of the control o



lee the results of Additional volumers generated for the Canson Road WTP. Beforman Wells and Crib Wells, phones see the Crip's Water (Quilty page at seature-secretication-tentification (Quilty page at seature-secretication-tentification-ten

Voluntary Monitoring

M

Cryptosporidium

has established secondary maximum contaminant level, BMCM and the secondary maximum secondary and an administration of the secondary secondary and puddings to assist public water systems in managing puddings to assist public water systems in managing puddings to secondary the secondary of the managinary contamination of the secondary systems in the system's results from the revision of natural deposit, the secondary secondary secondary secondary secondary secondary and a treatment and in the water treatment process.

For the results of additional voluntary monitoring see the Buckmon Direct Diversion unbestien of unusubdiproper or. To the redumnity monitoring results cliek the 'Quality' to an ord for many form to the Admiration, Tenting, and Reporting followed by 'Water Quality, Sampling Reporting.

Opposized of the statement persistent shall accome on in surface or control of the statement of the statemen

In scoperation with Los Allmost National Laboratory (L. Kritter and L. Kritter and L. Kritter and L. Kritter and L. Kritter and Ley Strong and the present Experimental Experiments (L. Kritter Contamination on a quantity basis Samples are malyred for redoubledes, general incognition of the contamination on a quantity basis chemicals, metals, which explosives and experime. The report an analysis are not greated that Laboratory-derived radiouscides are not greated by the laboratory with great and contamination and valve from these while are used, where from these whole are delivered to the Buckman Timb prior to distribution into the system.

Lead and Copper Rule

Microbial and Disinfection
Byproducts Rule
To Meroba in Disinfection
To Meroba in Disinfection by To Rule
To Meroba in the Indianate (April 1988)
To Marchael To Meroba (April 1

Unregulated Contamination

Monitoring Rule (UCM) (UCMR)

En was the Unreguled Oscialism Mositivity Ede

(UCMS) to object also for contaminant Mositivity Ede

to be present in direkty series and 60 not have Astillable-based
standards as under the Site Derhight, Work Ast (SDW).

Unregulated costumination unanimoring highs ER), to determine
where certain costumination covers and whethere the Agency

UCMS sampling for the EM required fauturation to finder

Was completed in the Sam Re waster system between March

and December 2009.

Then for had and copper are taken from contourner spin knotted throughout the Up once years. However, he has now recent insul of has the dropper taking though place in Magnit 2004. A new remaind if Lead the spin of the deceased head of leaf are now review beath and removed. The spin of the spi If present cheesal bright and on came versus behalt problem, or possibly for perguate summ and on our children. Load is problem, or possibly for perguate summ and one plants and components associated with the problem of the problem The Cyc (Stats Fr speak has dight compliante ampling location for TDM and MAC 1904 of the Child and open open equator. The sevenge of adoption reads for DBPs is a given location of the child and the child of the child of the locations the child and the child of the child of the locations the child and the child of the LDA at each reading many before the ACL (about might feet PAA) and to the modern many before the ACL (about might feet PAA) and to the the Indeed quarterly vessed might feet PAA, and to the to a cast might feet PAA, and now will, feet PAA, and TDM, indicating that the system is in compliance.

	MC	MCC	þ	li	Amer	30/25	Typical Source
dasr)	8	ž	2017 8.8	*	0.004	0.035	Of Stratuce of Stratuce chievaneses
Shale-	080	AN	2017	.080 NA 2017 0.057 0.022	0.022	Mgh T 0.069	of constant

Romant contollectly is required at the entered to the distribution system electrone conce is used to treat dictiding superage where I at the only treated water source that unplaine separated water to the clip of Stans F. Compliance is based on the remaining amount average (CAM) of mentally samples concelled from the inclined water. In sooy the highest SAA was cooks are IRWYT inclined water, in sooy the highest SAA was cooks and Lawring it is lever that he not one made. We consider the system was in compliance with bromate requiring that he system

Load 0 .015 0.022 of (ppm)

manuses 3.018 2330 2017 8.005g 0.003 0.003 0.003 distriction	8 2390, 2017 8,005g		WC	WCC.C.	2	1	I	2017	Typical Source
	Configuration Co	-		8	2017	9500	0.00	0.00	January Je
	Conference weet list City	I							The state of the state of

Monitoring for LANL Derived

ontaminants

merchants and the state of the

The Stage 2 DBPR also regulates the maximum residual for disinfectants clinifer drowing, free debroine, and chlorothus. The disinfectants are varies additives used to control microorganisms, particulative as residual definitions in fedinations special policy and produced and the stage of th

	MADE:	MACAG	12	1	į	THE .	Adela	Typical Saures
Chlorine	4 00	•	1017	ON 25'1 10'0 5'0 1100	0.01	1.52	Š.	Annual or other party of the pa

AL. - Action Lovel

- City of Santa Fe

 Water Quality Table

 The table on the following page lists contaminants which:

 The table on the following page lists contaminants which:

 The table includes only those constituents found those detection lists for regulated and

 The table includes only those constituents found above detection lists for the sampling, or during sampling in previous in the table includes only those constituents found above detection lists for the sampling or extering the control of the contaminants of the canadiant of the contaminants of the

onserve nater

The average of all of the monitoring regults and the mage described for any objected unregulated consuminants. Which star or Redeat fulls regular possibilities for the star of redeat fulls regular monitoring use present in the Locher commitments were objected and analysis as regulated by EN, but they were not found above detecting limits in any City of San Exercise Commitment of the San Francisco and therefore are a modeled in the above table.

for the foreign of manual deposits, best finishing from the foreign of the foreig August household plumbing 2013 No systems: Erosion of control deposits

8 68 of

Copper (13 L3

Exceeds AL Sample Date

> **7¥ MCTE



<u>amanamananamanamanamanamanamanamana</u> City of Santa Fe 2017 Water Quality Table Regulated Compliance Monitoring

mate / state line of page														1
Paper Pape	Confaminant	4	To Made	MCL0	City Well Fledd	Sample Date	Buckman Tank ¹	Semple Date	Canyon Road WTP	Semple	Buckney RWTH	Sample	Violedan	Typical Source
Page	torganic Contaminants ^c													
Payr 2 20 20 20 20 20 20 20	rsarııc	qdd	0	0	35 (NO-35)	2017	QV	2017	Ð	2017	9	2017	S.	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electrones production waster
Payer Sa Sa Carlo Sa Carlo Sa Sa Sa Sa Sa Sa Sa S	-	шdd	2	2	07.0 (KTD-D73)	2017	200	2017	0.07	7102	100	2017	2	Discharge from dallug wastes; Discharge from melal nefinenes; Ensson of natural deposits
Payr	enen	qdd	s	8	0-2	2017	Q.	2017	g	7102	9	2017	g	Docharys from perceions and metal reframes. Emisor of natural docposits, Docharys from mores
Span 10 14 Q-17 2017 NO 2017	Lende	шdd	5 * 6	4	1,0 (1.0-CN)	2017	0,4	2017	90	2017	13	2017	Ŋ.	Toson of natural deposis, Water acdilive which complete strong beets; Dectarge from lendizer and constants
NTU TT = 10 NA NA NA NA NA NA NA N	[N III] east	udd	01	22	7.2	7017	QV	2017	9	2017	9	2017	N	Nundi from lerbber use, Leaching from supto
Second S	ynthetic Organic Contaminants	,,										1		
S DOL 15 0 15 2017 14 2017	(2-Elbyhexyl) Phhalale	шdd	0,006	0	0.001 (ND - 0.001)	2017	9	702	모	7102	Q.	2017	ž	Discharge from rubber and chemical factories
S DOL 15 0	adloactive Contaminants													
POL ST NA POL ST ST ST ST ST ST ST S	ross Algha Emillans	POA	ž.	0	15 (#2-19)	2017	1.8	2017	NA.	ž	Q.	2017	2	Ercsion of natural deposits
90A 5 0 0.05 2017 0.05 2017 20	ross BetaiPholon Emmors	bOrt	205	NA.	17 (ND-14)	2017	35	2017	2	AN.	4	2017	No.	Decay of natural and man-made deposits.
FPD	acum 226/228	DOM.	s	0	0.39 - 0.75	2017	0.03	2017	NA.	2	0.03	2017	Ñ	Emics of entural deposits
MTU TT=10 0 NA		8	8	0	æ	2017	2	2017	¥	*	Ð	2017	S.	Troson of natural deposits,
NTU TT=1.0 0 NM NM NM NTU NTU NM	uritice Water Contaminants *											1		
NT TT* 0 NA NA NA NA NA	JOSEV (Populity)	ULIN	TT=1,0	0	NA	2	NA	NA.	0.22	2017	0.59	2017	£	Lai Runoff
	Andry (exect numby %	Ē	TT.		2	Ą	¥	NA	35001	2017	99,4%	7102	2	Sun Rundl
NA TT³ NA NA NA NA NA	Total Organic Carbon (removal rabo) (TOC) - TREATED	2	, L	ž	N.	MA	NA	NA	12, (12-13)	2017	¥	N.	No.	Naturally present in the exerciment

- 3/O1C:
 30 ER considerer So PG/L to be the level of consent for bett particles.
 b) Alternative compliance enterin used to ment TOC remone requirements (running amount average Of TOC remone) ratio must be 2 used month).
 c) The charge represent the righest and the values within the Compliance Period indicated, fromer than one sample was collected.
- O) Tuplefity is a measure the designation of the control in the causet it is a good indicated of the interferences of our filtration speaker. The Westlerfact Mon. When Prin. Persposar, Coage. Santa Fe, Si. Wilsia & Yornera. Discisional Wells in 32 and Medinesi Well.
 Discisional Wells in 23 and Medinesi Well.
 Q. Pormings mental exercision (MAA) of TOO from the principle with a first persposar.
 Q. Pormings mental exercision (MAA) of TOO from the principle of the persposar.
 Principle of the persposar of the persposar

Key to Units, Terms and Abbreviations

- NA: Not Applicable,
 ND: Not Detected:
 ND: Not Detected:
 ND: Not Detected:
 PUTJ: Nepholometri-Turbidity Units,
 ppm: parts per Units, or multigrams per liter (mg/L),
 ppi: parts per Units, or multigrams per liter (ug/L),
 ppi: price per Units, or multigrams per liter (ug/L),
 ppi: pieceries per liter (a mensure of radioactivity),
 pg/L. Number of micrograms of substance per liter of wate Number of micrograms of substance per liter of wate Number of milligrams of substance per liter of water
- mg/L: Number of milligrams of substance per liter of water, pumbos/Gn: Metrambas per ecolimeter or µs/cm (miers evaluaters) measure of desertical conduction in water due of discolved integrals tons (e.g., calcium, chlaride, posternia, character, calcium, character, calcium, character, calcium, character, calcium, c
- Pr-Co units: Platinum-Cobat color units a mossure of color also called the Hazen Scale" or "APHA color", as defined in ASTM International Standard Di2009 (Range): The range transmissible highest and low values. Range values are not provided if only one sample was taken during the range period.
 - LRAAL Locational running annual average the average of analytical results for samples at a particular monitoring focation during the previous four calendar quarters, LRAA at each sampling location must be below the MCL (color mod.) for final Halocerte, Acuts, and 0.080 mg/L for Total Tritalmenthmes). Action level: The concentration of a contaminant, which, if exceeded ets treatment or other requirements, which a water system must follow.
- descinoum Contaminant Level (MCL); The highest level of a contaminant that is a local administration of the MCLGs as feasible in the contaminant that the co Maximum Contaminant Level Goal (MCLG): The level of a contaminan a distance water below which there is no known or expected risk to health the close allow for a margin of sarry.
- Maximum Residual Disinfectant Level (MKDL) The highest level of a distinfectual gives of in clinical control of the addition of a distinfectual gives of inclining vacaor. There is control of succession control of a distinction is necessary for control of neterois) contaminants. Maximum Residual polistricticant I evel Coal (MRDLGG)— The river of a distinction when the properties of the
 - Secondary MCL (SMCL): Non-mandatory water quality standards for every than continuants established a guidelines to assist policy water systems in managing their divising water for seather considerations, such as tests, espec-tated door. These contaminants are not considered to present a risk to human such at the SMCL.

Map of Water Sources

Water Quality Report 2017

The City of Soula Fe's Water Division (the City) is pleased to provide the 2017 Water Quality Report, Atale and dependable raker supply is vital to our community and is the primary massion of

onrces of Supply

2011, the Buckman Direct Diversion (BDD) Project et signly was successfully integrated into the mi inbation system and operated in conjunction with th

City has prepared a revision of its 2003 Source Water tection Plan for finalization and approval by the governing

Do I need to take special precaution for experiments to meet a forest program of the meet properties of the properties o

Source Water Assessment and its Availability

er aus meiner er er tills meiner ver tills meiner ver tills meiner ver tills meiner ver tills mer er forderer av versider. The Statesprädier, verkande of the Grey of Statesprädier, verkande of the Grey of Statesprädier, verkande of the Grey of Statespradier, verkande og forderer statespradier verkande meiner verkande statespradier og forderer verkande forderer verkande og forderer verkande og forderer verkande verkande og forderer verkande verkande

voluntance adoption in 2009. John upon the recommenda in the Source Water Assument. The "Safe Debalogy Water Source Water Protection" and the "Stormwater Illicit David Control" conflamors provide additional controls are proceed for the CNP, ground and surface water supplies. In addition, for the CNP, ground and surface water supplies. In addition, proceedings of processing the Storm Forms country programs of resid-politural statements.

outerie información importante sobre la cauta Pe. Si tiene alguna pregenta o doda nuode hablacie a Patricio Pachero al se-

KAKAKAKAKAKAKAKAKAKAKAKAKAKAKAKAKAKA in my Drinking Water? Why are there Contaminants

Sources of dinning water (both lap water and botted water) include news, lakes, streams, ponds, reservoirs, springs, and wells, ab maler travels over the surface of the land orthrough the ground; lidescover and analysis occurring minerals and, in some cases, addocative materials and can pick up substances resulting fund can pick up substances resulting fund the presence of animas or though the presence of the presence



Microbial contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural investock operations, and wildlife.

organic contaminants, such as salts and metals can be aturally-occurring or result from urban storm-water runoff, dustrial or domastic wastewater discharges, oil and gas roduction, mining or farming. sticides and herbicides, may come from a variety of urces, such as agriculture, urban storm-water runoff, and sidential uses.

Organic chemical contaminants, including synthetic and volatile organic chemicals, are by-products of inclustrial processes and periodeum production, and can also come from gas stations, urban storm water runoff, and septic systems.

Soactive contaminants, which can be naturally occurring, -made from nuclear facilities and atmospheric deposition n former above ground tasking, or be the result of oil and production and mining activities.

order to ensure that tap water is safe to drink, EPA pre-ribes regulations that limit the amount of certain contam-nis in water provided by public water systams. Food and up Administration (FIDA) regulations establish limits for con-minants in bottled water, which must provide the same pro-cessor for public health.

Nitrates

City of Santa Fe drinking water meets the federal drinking water standard of 10 ppm for nitrates (10 mg/L as N). Nitrates have been detected in some of the City Wellis up to 8.4 ppm. Nitrate



Arsenic

The dirinting water standard for amenics in 10 µgh. The CNVs dirinting water committed to make this standard trong-Poul 2018, Amenic cocurs naturally in the sentir Sursit. When these arrants into ground water, While low or divising water means EPA; standard for service, it does contain not levels of service. The EPA, standard substroces the current undestanding of amenic is possible hashing debts against the coctant directioning americ from which supplies the service of the committee of the service of



Cryptosporidium

Opploapodium is a princiscam plansite trail is common in surface waters. The coopsi is the transmission stage of the organism, copploapodium is infroduced into our source waters via wid animal copyloapodium is infroduced in the surface of the copyloapodium is infroduced by the copyloapod by the copyloapodium is a ready introduced by the copyloapodium is a ready introduced by the copyloapodium is a ready introduced by the copyloapodium is a source to produce the copyloapodium is a copyloapodium in any cause crypticapodiums, an adomination in the copyloapodium in any cause crypticapodiums, an adomination in the copyloapodium is a copyloapodium in the copyloapodium in the copyloapodium is a copyloapodium in the copyl

Voluntary Monitoring

For the results of additional volumers modelstrained by Chronic Rest VITT and the state of the the s

EPA, his established sevendary maximum contaminants from (SNACL) for orderin contaminants. Secondary Standards are sopremicroscubble standards that serve an paideline, to satist public water systems in canaging their divising water. The presence of those contaminants typically results from the resolute of attented deposits, administrate and margiancies containing materials are used as transment and in this water treatment process.

Monitoring for LANL Derived contaminants

In cooperation with Lox Alamas Notional Laboratory (LNI) and he New Mexico Environment Department, the City currently monitors Budeman Wells 1, 6 and 8 for LNI. deviced contamination on a quantizery basis, and LNI. deviced contamination on a quantizery basis, and the control contamination of the Companion This createst than fortificated that Laboratory-derived radionacides are not present in the Sudeman Wells 1, 2, 6 and 8. The are not present in the Sudeman Wells 1, 2, 6 and 8. The are control contamination of the Companion Wells 1, 2, 6 and 8. The second of the control contamination of the Companion Wells 1, 2, 6 and 8. The wells are used, water from these wells are used, water from these wells are used, water from these wells in delivered to the Budeman Task poor to distribution into the system.

Microbial and Disinfection Byproducts Rule Byproducts Rule

The Microbal and Districtor's Sprockets (UNDER) Rates, are as at of internetiating regulations will a decrease that from microbal pathogens and demindration sproducts (DEPs.). The Stage 2 Chamilectants and Calminictors by philosopa Red (DEPs.) Red Stages on palic hastin procession by finiting exposure to (DEPs.) Conserved accompanies, to exposure to the internetiation of the procession and the internetiation of the microbal pathogens (THAI), the National according to exposure and the National according to t

This Copy Stepts Full payed make eight compliance ampling locations for Thirty and HAAS. Each could not a supplied consist the energy of subject installs for DRPs as supplied consist. The energy of subjects install for RPs and Stept installed for consist in more payed to the provious force payed payed for a side of the consolidation and annual swentige (SAAA). The URAA as each location must be below the MEI, (ROMF may for FAHAS and COOR may, for THIA, Requisit aboven in the Table hollow indicate that the incredual quantity yourse above in the Table hollow indicate that the incredual quantity yourse above in the Table hollow indicate that the incredual quantity yourse above in the Table hollow indicate that the incredual quantity yourse above in the Table hollow indicate that the incredual grant for the India. The Special URAA was 0.023 mg/, for INAA. The Special URAA was 0.023 mg/, for INAA. The Special URAA was 0.023 mg/, for INAA. Postage your was payed main compliance.

WCT: WC		1	City	Aures	18/04	Typical Sour
Holoacetic Acids (HAASs) 060 NA 2018 0.023 0.003 0.037	2	810	0.023	0.003	0.037	By-produc of drinking water chierlestk
Total Tibbalo- methane 080 NA 2018 0.058 0.004	2	078	0.054	0.004	0,060	By-produc of drinking water

Purpose to	tigge they	EMOTO :	Serios 2	2018	22.00		Francis
Typical Source	20181	Targe	Diagram .	ď	C) HCC	MQ	

and the state of t

The City of Santa Fe water system uses free chlorine as a disinfectant. For the year 2018, sampling was performed at 80 monitoring locations each model. The results are summarized in the table below.

o control	NO	ON 100 100	0.01	0.4	2018		4.0	Chlorine Residual
Transf law	F	100	1	1	ij	STATE OF	No.	

Lead and Copper Rule

secretal hours, you are streen you water has been allowed you having your lap for 30 secretal to a mouth of secretal water for directling or cooking. If you are comment about facilities in your water, you may with to have your water leated, information on I head in directling water, testing methods, and sleeps you can lake to minimize occopium a available from the Safe borningly Water Hosting (900) 425-419 or at 2015. Internation, pould design (900) 426-419 or at These to the safe to the safe to the safe to the safe to the Testing the safe to the safe to the safe to the safe to the Testing the safe to the safe to the safe to the safe to the Testing the safe to the safe to the safe to the safe to the Testing the safe to the safe to the safe to the safe to the Testing the safe to the safe to the safe to the safe to the Testing the safe to the If present, elevated levels of lead can cause poderna, especially for preparati women an unable for infraredy for proparati women and cased in christics; water is primarily from components associated with service limit and other proposations of the case of the City of Santa Fe is responsible for profiniting water, but cannot come! the variety of inflaming water, but cannot come! the variety or put in plumbing components. When your water is served thour, and the case of the case of

Trask by lead and copper are taken from customer laps local throughbuil The GNy conce entry three years. The most more good of lead and copper stating lock place in Septembra 2018. If present, devoked levels of lead can cause seek health problems, deceated levels of lead can cause seek health problems, deceated yet proppart ventom and you colleter. Lead in driving water is primarily from malarisats comprends seasonated with service intess and home jumbits.

The labble includes only libose consilibants found above determined from the state of the state

were detected in testing conducted by the City and New Mexico Environment Department. The table on the following page lists contaminants which:

1) have associated primary Maximum Contaminant Levels
(MCLs) that are regulated and

Water Quality Table

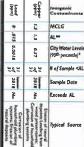
City of Santa Fe

2018

(ppm)	Copper (ppm)	Introduction Contaminants
- 17	E.	MCLG
.015	£	AL=
8100.0	0.37	City Woter Levels (90th percentile)*
#Q#	200	# of Somple <al< td=""></al<>
2018	101	Sample Date
Z	Ž.	Exceeds AL
tonode parmy south programs county programs	fraction of record deposits Leaching fro wood preservations. Currection of househor planting (present	Typical Source

'Results of monitoring are used to determine the concentration at the 96th percentile (e.g., if 100 samples analyzed, the concentration at the 96th highest sample, blassed on the founder of samples analyzed in 2018 the 96th percentile is the 28th rained sample for copper and lead.

** AL = Action Level



Please view separate 2018 Water Quality Table





For Information regarding the City's water conservation program, ways to conserve, and relates, please contact the City's Water Conservation Holline at (505) 955-4225.

<u>City of Santa Fe 2018 Water Quality Table</u> Regulated Compliance Monitoring

													1000
Contaminant	4	렃	MOLG	Chy Wa	Semple Date	Buckman Tank	Sample Date	Carryon Road WTP	Sandy Date	WICH STATE ALMS WANTED	Sample Date	Violation	Typical Source
Synthetic Organic Contaminants (SOCa)	anta (SOCa)												
Gi(2-ethylhsxy) Phihalate	ąd		۰	1.14 (ND-1.14	2017	9	2017	CN	3018	9	3018	2	Decreage from rubber and chemical factories.
Indeganic Confaministrals ¹													
Assert	qdd	10	0	3.5 (ND-3.5)	2017	ΟN	2017	ON	8102	9	7102	No.	Erosion of natural deposits; Pannit from orchards; Runoff from glass and electrories production waster
art.	шфф	2	*	67.0 E7.0 - GN	2017	6000	2017	000	8102	970	3016	Ą	Discharge from drifting westes, Discharge from includ refriences, Eroborn of natural deposits
Pupma	mdd	٠	7	01 00-21	2017	0.37	2017	0.17	2016	70.0	7102	No	Errors of profession Decharge from forelizer and whencom haddenes.
h-rel enas	udd	9	Q	(24-84)	2018	9	2018	QN	2016	QV	2018	Se .	anks, sewage. Erosion from natural deposits
Sdenum	ík.	8	58	# · #	2017	g	2017	Q.	2018	Ð	2017	2	Discharge from petroleum and metal refinances; Emisson of natural deposits; Discharge from mines
Radioactive Contamingnits													
Gross Alpha Emillers	port	S)	0	0.2 (0.2 - 0.8)	2017	9.0	2017	2	26	59 (0.5-59)	2018	N ₀	Erosion of natural deposits
Gross BetailPhoton Emitars	pCet	Īh:	¥	14 OF 14 OF	7102	35	2017	NA	ž	56	902 8	æ	Dicay of neural and many sace deposits.
Radium 226/228	por	38	9	0.75 (0.39-0.75)	2017	53.0	2017	NA.	2	0.03	2018	2	Erosion of natural deposits
(e)	ęd	æ	0	Ŀ	7102	*	2017	\$	ş	80	2018	2	Ercavon of natural deposits;
Burface Water Contaminants													
photographic and a special production of the	Œ.	П=10	o	ž	ź	2	N.	0.26	2018	61,0	2018	2	Sultendi
Turbidity (lowest monthly % meeting limits)	JĒN.	TT * % <0.3 NTU		ž	*	¥	*	100%	2018	100%	2018	2	Rai Runoif
fotal Organic Carbon Iremoval ratio) FOCH - TREATED	2	Ĺ	NA	NA	2	2	¥	12.13)	2018	5	2	2	Standing present in the animoment.

- EPA considers 50 pCill, to be the level of concern for beta particles, Alernative compliance criteria used to meet TOC removal requirement (furning amida senage of TOC removal adio must be 1 each mortal). The range represents the highest and for walkes within the Complian Period indicated if more than one sample was collected.
- of profits interesting the control of profits of the control of profits of the control of the co

Key to Units, Terms and Abbreviations

- Nephelometric Turbidity Units, parts per million, or milligrams per liter (mg/L), parts per billion, or micrograms per liter (μg/L), procouries per liter (a measure of radioactivity).
- NTU: Ppp:: ppl:: pc/l.: mg/L: TT:
- Number of micrograms of substance per liter of water.

 Number of milligams of substance per liter of water.

 Transment Technique standard was set instead of an Maximum
 Contaminant Level

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

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

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking waters. MCL's are set as chose to the MCLOs as feasible using the best available treatment lechnology. LRAA: Locational running annual average - the average of analytical insula-ter annotes a porticular montrioning location during the previous four calend quarters. LRAA at each sampling location must be below the MICI (0.060 mg/ for Total Haleacetic Acids and 0.080 mg/L for Total Trihalomethanes)

in mum Contembrant Level Goal (MCLG): The level of a contembrant in this water betownther there is no known or expected risk to health. MCLGs in or a margin of alreign.

Michael Residual Deinfectant Level (MRDL) – The highest level of a determinant above indexing water (has a convenient above to the deficient above to the second of mentioned conformation; a desinterent is reconsisty to control of mentioned conformation. The level of a mixture Residual public feature Level Gaal (MRDL) – The level of a shirton water disinfectant between the periods of the properties of the conformation of the periods of the properties of the period of the periods of the period of the period of the periods of the period of the period of the periods of the periods of the periods of the period of the periods of the p

Secondary MCL (SMCL): Non-mandatory water quality standards for cert contaminants established as guidelines to assist place, water system managen; then definingly safely the aesthetic considerations, such as safely and and door. These contaminants are not considerated to present a fisk to huminate that SMC.

ique: a required process intended to reduce the level of a

2018 Water Quality Report

Map of Water Sources

The DL of Status Exc Water Diskon the CPUs is pleased be provide the 2016 Visian Cultary Report. A safe, and sisened-shear stapply is full to currentming that it to primary status or the Dc M. The mont: a provided annually and contains offered-some into culture for the culture of the some into culture for the colored some into culture for colored colored some into culture and colored some into culture for the colored some into culture and colored some into culture and the colored some into culture many by the colored some interesting and the col

Sources of Supply

The Cryows served by four distinct sources of supply in 2018.
The Cryows served by four distinct sources of supply in 2018.
The State Rever where it is stored in the MacKalline and Albeit Reserved for the Institute States where from the State if River and Rel Calmone is treated income in States and an advanced brainment plent (states) and advanced brainment plent (states) and states and states

Assessmen

and its Availability ource Water

Will, In the Gerham Olived Diversion (BDD) Project surface was 1991 in the control of the Theory of the control of the control of the control of the control of the BRAMT as along the control of the control of the control of the Oliver was the control of the con

enformments adopted in 2005 built upon the recommendate Water Assessment The "Safe Designor Water Protection" and the "Stormwater Vilicit Designor

m rever Matrico Environterio Department (PARE), conceles conceles Vieta Austrantic Per Doc (Se Aller E. In Tan assert rodose a exterimentorio ol sucrio water arteriori messa un rodose; a celementorio ol sucrio water arteriori messa de producei: The Succeptoria Australia (Pare Dio (Satur Fire an Producei: The Succeptoria Australia (Pare Dio (Satur Fire an e socia est effectoria della messa del concentral, a e socia est effectoria productivo della productiva del e sociale del presenta della productiva della productiva e sociale della productiva della productiva della productiva e sociale della productiva della productiva della productiva productiva della productiva della productiva della productiva productiva della productiva della productiva della productiva della productiva productiva della productiva della productiva della productiva della productiva e productiva della productiva della productiva della productiva della productiva e productiva della productiva della productiva della productiva della productiva della productiva e productiva della producciona della productiva del

I need to take special precautions is a poste my to a more memorial to comman strategy are in m. to poste scalesto. Incompension of the poste scalesto. In standards, some selector, and infants can including an arist on including an arist

cos, comments, or suggestions regar or Alex Puplis at 505-855-4232 or with

to a skoul defining water from their health care providers. Centers for Deseare Control (CIDC) pusielines on optiate means to lesson the risk of infection by integerodium and other microbial condensianis are label from the Sate Direkking Wister Hoffinin (800-420.

Why are there Contaminants in my Drinking Water?

Sources of drinking water (both lap ment and the covers cause) inclosi-receiving, soring, and version, water trees over the surface of the land orthough the ground; lidised we included by counting mentals and, in some cases, redicative malerial, and can pick up subserious resulting and can pick up subserious resulting in the prosence of animals or from hum to prosence of animals or from drinking water may include.

Microbial contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildiffe.

Inorganic contaminants, such as salts and metals can be naturally occurred or manual from urban storm-water runoff, mediumist or admissio westered discharges, oil and gas production, mining or farming.

Posticióes and herbicidas, may come from a variety of sources, such as agriculture, urban storm-water runoff, and residential uses. Organic chemical contaminanta, including synthetic and valelle organic chemicals, are by-products of inclustrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.

Radioactive contaminants, which can be naturally occurring, man-made from includes flacifies, and atmospheric deposition from former above ground sating, or be the result of oil and gas producion and mining activities.

In order to ensure that lap water is safe to drink, EPA pre-scribes regulations to film the emony of certain confami-waters in water provided by public water systems. Food and Drug Administration (FDA) regulations establish finits for con-terminate in bottler water, which must provide the same pro-aduction to public material.

Chy of Santa Fe dinking water meets the federal drinking water standard of 10 pun for oitsakes for may. As Nikites have been detected in some of the City Wells up to 8.4 ppm. Nititate Nitrates

use of rainfall or agriculta infant you should ask adv

The divivilge water standard for stencie as 10 justil. The City's diviviory switer contributed to meet 11th standard such street than 2016, America court in translation to the support of section 11th standard such When the standard substances for the outsile of section 11th substandard but substantial but out division was mercelly made to the substantial substances for examinating the standard but substantial but out the substantial division substantial substantial substantial substantial substantial substantial divisions substantial substa



He the worder of sufficient volumes promitted to the Carpor Road WT. Buddens Wolffers and will be seen the Carpor Road WT. Buddens Wolffers and the seen the Carpor Road WT. Buddens Wolffers and the seen to be the few could be seen to be the few could be seen to the few could be seen to the few could be seen to the worder has seen to the worder has the seen to the worder has the discontinuous from wolf and the could be seen to the worder has the collected at the point of many of waste another word with the seen that the collected at the point of many of waste into the Carly discluding on the worder of the profit of many of waste into the Carly discluding the seen that the collected at the point of many of waste into the Carly discluding on the worder of the point of many of waste into the Carly discluding waste of the proportion of the discluding system through many be what is then before Chy successive the control of the secretarions of the discluding waste when through many be what is from other Chy successive the control of the secretarions of the discluding waste when the could want to the discluding waste the control of the discluding waste waste for the discluding waste and the collection of the discluding waste of the control of the collection of the discluding waste and the collection of the discluding waste of the collection of the discluding waste of the collection of the discluding waste of the collection of the collec

Voluntary Monitoring

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Cryptosporidium

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EX) has emphished secondary maximum contaminant broad (SVRI) and secondary secondary secondary broadches in consecuence, and sealed that secondary pudelines to sastic public water systems in managine, their definition was from presence of these contaminants bytestly results from the rewine of natural deposits. Numbers of natural deposits and secondary secondary secondary processing materials are seed as treatment shall in the water treatment process.

In April 2007 the City began a laceyaer study to ordermine the average forgetzed-duct necessaries in a secure season expension of the company of the company

Monitoring for LANE Derived

ontaminants

trealing surface water such as BDD is required dium for 24 consecutive months. At the BDD the

Microbial and Disinfection

Byproducts Rule

The Worse and Envisor Products are a set of membrane special places are a set of membrane registers in a soften either mercals products and conference in particular products (1981). The products of conference in places in products (1981), The focuses to place them received by the second of the second places in the products of the places of the pla

The Chy of Stratus Fe system has eight complained sampling locations for This world MASK. Each obtain is sampled control per aparties for the Third Stratus of the Stratus of St

	MC.	MCG.	CL MCG. No. LA	CALL!	Į	e 2012 Tres	Typical Source
Holosterile Acids (PSAASs)	3	MA	2018	0.073	A 2018 0.023 0.003 0.032	0.032	By-broduct of drinking water chlorination
Trihalo- methaire (TTHMs)	080	A	2018	0.054	.080 NA 2018 0.058 0.004	0.004 0.040	Py-produce of drinking
		ı	l	ĺ			The second second

Blomatin monotogies is remotived as the science, as the disclaration partial memory come is and to street devices a restar disclaration as the order treets order enter a logical extraction sense. The comparison of the comparison

the results of additional voluntary monitoring see the chicaman Driver Diversion undelete of unturchaldroject.

To ticer objusting mentioning results click the mailty that one of Mentiony mentioning results click the mailty to be on Yonicotoning Testing, and willing the one of Nonecotoning Testing, and cortran followed by Wester Quality Sampling Reports.

	WG.	9	1)	H	Ranner	3016+ 7	Tentino Sauve
ī	1	OKI	3818	1,000	0.0043	3 8.6052	Disposadore of Granding

The Stage 2 DBPR also regulates the maximum residual for disinfectants: chlorin edicoxide, the chlorine, and chloramines. The disinfectants are water additives used to control microorganisms, particularly as a residual disinfectant in distribution system pipes. ndividual membry services monitoring to complance value is based on monitoring required at BRWTP cody. Complance value is based on monitor amount average (RAA) of monitory (mains) water results.

The Cky of Santa Fe water system uses they choose as a disinfectant, for the year 2018, sampling was performed at 50 monitoring locations and month. The results are summarized in the table below.

In cooperation with Las Alamos National Laboratory and Laboratory and the West Incredo Environment Department, the LNL and the West Incredo Environment Department, the LNL correctly mentions Bedsome Wells I, 6 and 8 feet LNL control mentions for environment of country hoster families for enables of the collections of separate and expense. This repeat another the the control mention of separate and the induced that Laborator-derived reduced the Section Wells. The results do indicate detectable locks of redionacides are not present in the Bedsom Wells. It, 5 and 81, 7th results do indicate detectable locks of redionacides associated with natural sources. These wells are used, what from these wells are used, water from the wells are used, water from these wells are used, water from these wells are delivered to the Bedsomm Tank prive to distribution into the system.

MA	ž	MIDIO	j	ļi	1	2	lakelee.	Typical Source
Chlorine Reziduai	3	•	2018	2018 0.4 0.01 1.04 NO	0.01	10	NO	Marker Michres Lord Morbred Morbred

Lead and Copper Rule

City of Santa Fe Water Quality Table

2018

If present, declarated fevels or listed can cause servicus health positions, especially fevels or listed can cause servicus health cannot reduce in chronicy, service is primarily leave in presentation or components secondard with service leves and home guarantee for the CPA of Status first is expressed by the provided in Properties and home grantee in the service service of materials used on Aphrology components, when you waster has been study for the present in the bean study for the service of the control of the provided in the service of the service of

The Lable on the following page lists contaminants which: 1) have associated primary Maximum Contaminant Levels (MCLs) that are regulated and were detected in testing conducted by the City and New Mexico Environment Department.

Tests for lead and copper are bisen from customer tips located introducing the form of the company of the compa

The table includes only lrows containants found above electron linear and only the second of the property of t

Source Source	Entirely of cases of deposits Lendbey from most preservatives. Currence of focusefuld planting systems.	Corresion of household plumbing systems: Brosion of natural deposits
TA thesest	ž	ž
Sample Date	3016	3012
# of Somple <al< td=""><td>200</td><td>30.0</td></al<>	200	30.0
istop berunge), Çek Mater Festip	0.37	0,0018
**79	2	510
970W	3	•
olnorganic etnonimetno	Copper (ppm)	Lead (ppm)

Please view separate 2018 Water Quality Table Conserve Water...

*Results of monitoring are used to determine the concentration at the 6th preventier 6th, if 100 supplies analyzed. The conconstration at the 90th sporet, amongs, Sando or the number of samples analyzed in 2018 the 90th percentale in the 28th intend sample to cooper and feed.

every drop counts



For information regarding the City's water conservation program, ways to conserve, and relate, please contine City's Water Conservation Holling at (505) 955-42.

City of Santa Fe 2018 Water Quality Table Regulated Compliance Monitoring

Centrolnant	Chells	r)	MCLG	Clay Weal	Sample Date	Buchman Tank	Sample Date	Campon Read WTP	Sample Date	Sections PATP	Sample Date	Violetion	Typical Source
Synthetic Organic Contaminants (SOCs)	ants (SOCs)												
Ochetykey) Pibeles	8	3.	0	#1. (ND-1.14	2017	Ð	2017	P	2018	9	8102	S	Discharge from nubber and chemical lactones.
Progenic Contaminants ^c													
Anne	8	0,1	0	35 (NO-35)	2017	DN .	7102	Ð	2018	9	18	S.	reson of natural deposits; Purnof from orchards;
5.2	шdd		•	E7 0 (E7 0 - GN)	2017	0,039	2017	0.03	2018	88.0	2018	2	Dacharge from Griking westes, Discharge from metal refriences; Erosion of natural deposits
Auste	£.	0,000	¥	0.0 (NO-0.1)	2017	0.37	2017	440	8102	0.37	7102	S.	Protect from leah Discharge from (withzer and shamman factories
N se l	шdd	OL.	10	(24-84)	2018	QN	2018	Q.	2018	9	8102	S	Rundi from lentizer use, Leaching from septic lanks, sewage, Eroskon from netural deposits
Same	£	99	sı	6-3	2017	Q	2017	9	8102	Ð	7102	N.	Discharge from petroleum and metal refinences: Eroslon of natural deposits; Decharge from mixes
Nadioactive Conteminants ⁶													
Grass Alpha Emitiers °	por.	145	0	0.8	2017	97	2017	*2	¥	(65-50)	2018	o _N	Ercation of natural deposits
Gran field Poolse Earliers	pCr.	205	NA	14 pp-14	2017	3.5	2017	ž	\$	26	810S	2	Occepy of natural and man-made deposits.
Radium 226/228	PCM.		o	0.75 (0.39+0.75)	2017	0.03	2017	NA.	ž	0.03	8102	2	Erosion of natural deposits
Design	ęģ.	8	ě	ŧ	2017	2	2017	NA	M	w	2018	£	Ercaion of natural deposits;
Surface Water Contimipants													
spire swipping spires	EN	T = 10	a	2	¥	NA	*	97.5	2018	91.0	2018	P.	301 Planti
Tubbly fowar much 5.	Ē	TT= %<03NTU	0	NA NA	ž	¥	N.	100%	2018	100%	2018	2	Surrent
Test Opece Carbon respect mon TOCL - TREATED	2	î	Ą	NA	2	NA.	NA.	12° 12-13	2018	NA	M	SN SN	Maturally present in the environment

- Alternative compliance criteria used to meet TOC removal requirements (running annual average of TOC fermoval ratio must be >1 each month). The range represents the highest and tow values within the Compliance Period indicated, if more than one sample was collected.
- Frankon, investory, and Orass Alphe Emitters excluding Radon and Uranium

 c) City wellfield: Alto, Agua Fria, Ferguson, Osape, Santa Fe, St, Mikes & Torreon. Buckman Wells 1-13 and Northwest Well,
 Running annual average (RAA) of TOC removal ratio for each month during 2018 - minimum ratio was 1.2 (as per 40 CHR 141.135 (p) 2006).

Key to Units, Terms and Abbreviations

- Not Applicable.
 Not Detail of the Control of the Co ppm: ppb: pcI/L: pg/L: mg/L:
- A Treatment Technique standard was set instead of an Maximum Contaminant Level Number of micrograms of substance per liler of water. Number of milligrams of substance per liter of water.

(Range): The range represents the highest and low values. Range values a rot provided if only one sample was taken during the range parbod.

ALACTOR INVESTITE EXCENTIATION OF SOME ANION IS exceeded from the comment of some anions. Which, if exceedings to summent or some requirement, which a water system must follow.

LRAA: Locatoral running arrunal average - the average of analytical result temptes at a percular monthoring bocator atting the previous four clared quarters. (EAA at each sampling bocator must be bottom the MCL (0.00 mg for Yotal Haloscelic Acids and 0.090 mgL for Idaal Thindomethanes)

Machiner Contaminant Level (MCI). The highest level of a conteminant has its allowed in directing valet. MCI, as are set as ofces to level MCI, Gas feesible its sillowed in direction to the MCI as a set as beside with the best available innaminer include by instantiant mCI and in the machiner in the m

Maximum Residual Disinfectant Level (MRDL) — The highest level of a Maximum Residual Disinfectant Level (MRDL) — The highest level of a disinfectant shaved in christoy water. These is controlled contaminants, of a disinfectant in necessary for control of microbial contaminants. In the control of the control of microbial contaminants of distinction residual behaviors. The control of the control of distinction science disinfectant below which there is not some or expected that hydroxy science disinfectant below which there is no strong to highly. URDLOG do not reflect the binnetts of his use of disinfectants to control.

edary MCL (SMCL): Nor-mandatory water quality standards for cert minants established as guidelines to assist public water systems enen their diristino water for aeathelic considerations, such as lasts, co ing their dunking water for accuments considerations, such as tasts, of to. These contaminants are not considered to present a risk to hur at the SMCL.

a required process intended to reduce the level of a

Water Quality Report 2018

Map of Water Sources

For Coll of Stars. For Whiter Defacts (the Cib) is pleased to protect the 2016 Whater Collady Report, A safe, and demerherants rapidly stall councernumbry and this braining mission of the CAF. This report is provided annually and contains instance in the CAF. This report is provided annually and contains instance in the cally owner dealment demographical, but additionation in the cally owner dealment demographical, but additionation in the calls of care dealment demographical, but additionation in the calls of the calls and the calls and the calls and the calls and the calls are contained and the calls also the calls and the call calls and the call and the calls and the calls and

Sources of Supply

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Source Water Assessmen and its Availability

in meeting of distincts have a supply while projection is not a more projection to be used with the projection of the uity meeting to be suffix a well mandated and objects in uity meeting to be suffix a well mandated or of operated or the sources of division where are presently protected from pal, sources at contamination based on an evaluation of the sub-ply of the project of the sub-ply of the supply of the Assessment is available by combal. NAED at 505-471-893.8

En Espano

<u>City of Santa Fe 2019 Water Quality Table</u>

Regulated Compliance Monitoring

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- Constitue of		N.	X	X	1		N. C.	N. N.	Z Z		Z		
Arsene	866	p.	.0	35 (20-35)	2017	9	1102	\$	2019	9	2019	*	Emiliary of values deposits. Pured than probable.
anm	Md.	w	2	0.7 (ND-0.7)	2017	90	2017	200	2013	9070	2019	5	Dacherge from deling westen, Decharge from most refreses; Éresion of natura deposits
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Marcha [as N]	Mád	Ð	p	5.7 (NO - 5.7)	\$UZ	9	2018	Ð	2019	2	2019	2	Lead for texture as Leading from sopic birts
maqq	Med	s	8	2 (ND-2)	7102	2	2017	9	8 8	9	2019	2	Decharys has patched and reds referent, Ecology of neural deposits, Decharys for mores
Patricular Commission."	ı	K	1	X V	1		XX	X	N/Z	N S			
Grout Alpha Emilians "	PQ.	9	0	0.8 (0.2 - 0.8)	1102	979	4102	3	9	85	2018	,	Expuse of related departs
One least one leader	ğ	88	¥	12 N 24.00	7102	s	2017	3	×	92	2018	£	Decay of raunal and min-made deposits.
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Venium	Æ	8	39	ø	2017	æ	7102	F	0/		2018	2	Esse dinara becom
Safes Tree Consumers		K	X	N V	Z.	MAN TON MAN TON MAN	N. X.		NY		2000		
Turbidly (highest single fransument)	Ē	0,r=7T					4	953	8102	0.02 - 0.21	2019	2	Salter
Turbidity (paemi monthly % memory lents)	Ē	TT= %<0.3 MTU	30	3			100	%001	£	1001	2019	2	Soi Rundi
Total Organic Cerbon (emovel rabo)	ş	È	¥	3	2		(8)	1.17	816	*	-	×	Maraly present in the environment

Key to Units, Terms and Abbreviations

2019 Water Quality Report

Map of Water Sources

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Sources of Supply

urce Water Assessment Source

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City ordinances adopted in 2005 built upon the recommend in the Source Water Assessment In State Direktup. Source Water Posteriors and the Summarier line. Contro Contro Control Contr

Why are there Contaminants in my Drinking Water?

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- Microbiel contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- regional configurations such as salis and melais can be regulative occurring or result methal software such methals for connective wastewater declarations or connective wastewater declarations. The such methal of the such control of the such cont
- Organic chemical contaminanta, including symbolic and votalise ingenic chemicals, and by Oppocate of industrial procession and general procession and general procession and set in a site corner from gas stations, urban storm water fundit, and sopic systems.
- Radioactive contaminants, which can be naturally occurring, man-made from nuclear statistics and astronomers deposition from former above ground institute, or the result of bit and gas production and mining astronomers.

In crade to ensure that Lib water is set to critic EPA prescribes regulations had limit the amount of certain conformation makes to the conformation makes for the conformation of EPA regulation establish limits for conformation in bottole water, which must provide the same protection for public health.

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Cryptosporidium

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Ary new paint system harden such as BOD as retained to movine. Crystopopoiaum for 24. consecutive mortine. As in BOD to the univasion on the Set Grands water Coprosporation fact sealin ranged from 0 to 0.4 coopsist. Coprosporation fact sealin ranged from 0 to 0.4 coopsist. But to the paint is necessful ranged from 0 to 0.4 coopsist. But to the paint is necessful and the annual as morting control of standard citizen as according to control of standard citizen and according to control of standard (Coprosity series detected citizen) are according to control of standard (Coprosity Series detected citizen) are according to control of standard (Coprosity Series Coprosity Series (Coprosity Series Coprosity Series Coprosity Series (Coprosity Series Coprosity Series Coprosity Series Coprosity Series (Coprosity Series Coprosity Series Co

Sodium

Sodium levels for all Sanla Fe entry points range from 7.5 to 26 PPM. The system-wide average is 8.9 PPM.

Voluntary Monitoring

Microbial and Disinfection

The Merchal and Discource State

The Merchal and Discource Broadcas (MSP) Rates
merchal and parameters produce MSP Rates
merchal and parameters and discource of the produced of the State of the Stat

The City of State II, specially has eight processions asserted to per quantity and ILAMS, Each foundain is asserted to per quantity. The average of subjection states for Didle's at a good boatcom curing the previous four quantity samples is called the bestinded froming among a service four quantity samples in called the besting the ILAMS. The LAMS are less to perform that the power or life. (10 Phil Med. as the state of perform that the power or life.) The below indicate that the special for compliance. In the Table

THE PARTY CONT.	Separation of the separate of	of Scientists	statistics.
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	Materials Accels (P4AASs)	Trees.	T + cumbb b

Bornatta monolatoria en transcriora at las entraces de la Mostala y sparam antenesera Cozona is used to trenst develora gravas BRATD is the only fustalow audic accord to this sparadownistin to the City of Sanka Fo. Compliance is bested on the curving annual. International control of the compliance is the control annual. International control of the control of the curving annual. International control of the control of the control BRATID finished water. The results are summarized in the Libbs Debtor and ordinate traptume feeds were in compliance.

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WC.	1	Spendy.
	-	Harry Parket

Monitoringforf A'NEDerivea

M

The Stage 2 DBPR also regulates the maximum readule! I followership in the distribution of coloring decidents in water additional used to control incorpanies. Particularly as a residual distribution system pipes. OTALANTI SALIMENTO HANDER OF THE

The City of Santa Fe water system uses free chlorine as a distribution. For the year 2019, sampling was performed at 80 montarions can be mouth. The results are summarized in the table below.



Lead and Copper Rule

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Erosion of natural
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(BAA)



For information regarding the City's water conservation program, ways to conserve, and rebates, please contact the City's Water Conservation Hotline at (505) 955-4225.

City of Santa Fe

1) have associated primary Maximum Contaminant Levels (MCLs) that are regulated and 2) were detected in testing conducted by the City and New Maxico Environment Department. Water Quality Table The table on the following page lists contaminants which

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Please view separato 2019 Water Quality Table (on the reverse side of this page)



City of Santa Fe 2020 Water Quality Table Regulated Compliance Monitoring

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Inorganic Contaminants ^C	ninants	٠				П							
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Nitrato (es N)	Mdd	01	9	54 (25-54)	2020	QN	2020	Q	2020	Q.	2020	No	Runoff from ferblizer use, Leaching from septic lambs, sewage; Erosian from natural daposits
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Radioactive Contaminants ^C	taminar	o FFE											
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Region 226/228	lo4	-S	0	(0.4-0.8)	2017 - 2020	10.0	2020	900	2020	0.25	2020	P	trason e natural deposits
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Surface Water Contaminants C	ontamin	ants c										H	
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Total Organic Carlson (removal ratio)	2	È	2	as.	2	*	*	101	2020	**	¥	2	Parentment of a track (Better)

2020 Water Quality Report

Source of Supply Map of Water Sources

Key to Units, Terms and Abbreviations

Sources of Supply

Nephelometric Turbidity Units, parts per liter (mg/L), parts per million, or militams per liter (mg/L), parts per billion, or micrograms por liter (ug/L), picocurlos per liter (a messure of radioactivity),

ugit. Number of micrograms of substance per liter of water mgit. Number of milligrams of substance per liter of water

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

AAF, Localismal running annual average - the average of analytic for symmetrs in particular including laboration draining be provided in cleantal a spacing a standard a cash sampling baseton must be belief which (60 pg). For Total Hakasechie Acids and 80 ugh. for Total violamphages.

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Why are there Contaminants in my Drinking Water?

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- Radioactive contaminants, which can be naturally courning, mah-made from nuclear facilities and atmospheric deposition from former above ground testing, the the result of oil and gas production and mining annium.

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Voluntary Monitoring



Derived Contaminants Monitoring for LANL

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Lead and Copper Rule

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Water Quality Table City of Santa Fe

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Please view separate 2020 Water Quality Table (on the treethe alde of this page)

Conserve Water... every drop counts

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For information regarding the Chy's water conservatio program, ways to conserve, and rebates, please contact the Chy's Water Conservation Hottine at (505) 955-422.

PARKACIAN PARKAC

City of Santa Fe 2021 Water Quality Table Regulated Compliance Monitoring

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Inorganic Contaminants ^C	ninants	u										i.	
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Redlum 228/228	DC/IT	٩	а	0.8	2017 - 2020	100	2020	900	2020	800	1202	No	Eropeon of natural deposits
Uses	R.	8	•	+	2017 - 2020	N.	2020	8	2020		2021	2	Control of remark deposed
Surface Water Contaminants ^G	ntamin	ants c											HALL STREET
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2021 Water Quality Report

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Key to Units, Terms and Abbreviations

Sources of Supply

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Do I need to take special precautions?

Source Water Assessment Map of Water Source The Quant second Data distinct of the Quantity of 2211. In 17 (Quant second Data distinct of the Quantity of

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Contacts for Additional Infor

Why are there Contaminants in my Drinking Water?

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- Radioactive contaminants, which can be naturally occurring, man-made from nuclear itselfluses at amospheric deposition from former above ground leating or be the result of oil and gas production and minin scrivilies.





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Derived Contaminants Monitoring for LANL

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City of Santa Fe Water Quality Table

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Please view separate 2021 Water Quality Table (on the reverse side of this page)

Conserve Water... every drop counts



For Information regarding the City's water conservation program, ways to conserve, and rebates, please contact the City's Water Conservation Hobine at (\$05) 955-4225.

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Appendix C

NMED List of Potential Sources of Contamination

Map Code	Land Use	Description	Contaminants of Concern*
AGRICULTURAL LAND USE	4L 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	Nítrate, Amnonia, Chloride, Fertilizers, Pesticides, Herbicides
AHC	Horticultural/Gardens/Nurseries/Greenhouses	Operations/Storage	Pesticides, Herbicides, Fertilizers
AHF	Hay/Feed and Veterinary Product Storage Sites	Farm/Ranch Storage Site	Fungicides, Pesticides, Nitrates, Pharmaceuticals
AMA	Manure or Livestock Waste-Land Application Areas	Land Application of Manure	Nitrate, Ammonia, Phosphate, Chloride, Pathogens, Pharmaceuticals
AMS	Manure or Livestock Waste-Storage Facilities or Sites	Lined and Unlined Manure Storage Facilities	Nitrate, Ammonia, Phosphate, Chloride, Pathogens, Pharmaceuticals
AOA	Livestock Production-Other Animal	Livestock Wastes	Nitrate, Ammonia, Phosphate, Chloride, Pathogens, Pharmaceuticals
APF	Livestock Production -Poultry	Poultry Sewage Wastes	Nitrate, Ammonia, Phosphate, Chloride, Pathogens, Pharmaceuticals
APP	Processing Plants or Mills- Hay, Grain, or Produce	Operations, Waste Storage and Disposal	Organic/Inorganic Chemicals, Lubricants, Machinery Wastes
ARL	Animal Rangeland	Rangeland and Pasturage	Nitrate, Ammonia, Phosphate, Chloride, Pesticides, Pathogens
ASC	Bulk Agrochemical Storage-Petroleum/Chemicals	Storage-500 gallons or more	Petroleum Products, Inorganic/Organic Chemicals
ASF	Bulk Agrochemical Storage-Fertilizers	Feed Mill, Agricultural Co-op	Fertilizers
ASG	Bulk Agricultural Product Storage-Grain or Produce	Grain Elevator, Warehouse or Storage Site	Fungicides, Oils, Lubricants, Machinery Wastes
ASH	Livestock Production -Sheep	Livestock Sewage Wastes	Nitrate, Ammonia, Phosphate, Chloride, Pathogens, Pharmaceuticals

.

Page 1 of 6

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	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
DDD	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, Vamishes, 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
CHIM	Home Manufacturing	Operations/Maintenance/Storage	Paints, Solvents, Organic/Inorganic Chemicals

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	ID 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 Organio/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

Map Code	Land Use	Description	Contaminants of Concern*
lG0	Gas/Oil Wells-Active/Abandoned/Test, Wells Geothermal and Industrial	Production	Oil, Natural Gas, Organic/Inorganic Chemicals, Acids, Bases, Drilling Wastes
THD	Historic Dumps/Landfills	Storage/Disposal	Leachate of Organic/Inorganic Chemicals, Acids, Bases, Metals, Solvents, Gasoline, Diesel Fuel, Pesticides, PCB's, Automotive Wastes
ІНМ	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
ТМО	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
TTI	Transport/Distribution, Warehouses, Truck Terminals	Operations/Maintenance/Storage	Gasoline, Diesel Fuels, Automotive Wastes, Metals, Organic/Inorganic Chemicals, Acids, Bases
Qni	Unregulated Dumps/Excavated Sites, Snow Dumps	Storage/Collection/Disposal	Organic/Inorganic Chemicals, Automotive Wastes, Oil, Gasoline, Runoff from Adjacent Sites

Source Water Assessement & Protection Program Report Template July, 2004

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, Pathorens, 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/RE	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/Disposa1	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

Map Code	Land Use	Description	Contaminants of Concern*
SSF	Single Family Residences - Unsewered	Wastewater Discharge to Septic Tank/Leach Field or Cesspool	Septage, Pathogens, Nitrate, Ammonia, Chloride, Heavy Metals, Household Pesticides Herhicides Cleaning Agents and Solvens English

^{*} Contaminants of Concern include substances that are commonly, but not always, associated with the Contaminant Source listed in column 2

Appendix D

Sampling Schedule from Drinking Water Watch

New Mexico Env Departme		UOCP Operator Lookup	Drinking Water Program		
County Map	of NM	Water System Search	Helj		
The Park of the Pa		Water System Detail Information			
Water System No.:	NM3502826		Federal Type:	C	
Water System Name:	BUCKMAN R PLANT	REGIONAL WATER TREATMENT	Federal Source:	SW	
Principal County Served:	SANTA FE		System Status:	A	
Principal City Served:	SANTA FE		Activity Date:	01-01-2011	

Expanded Sample Schedules / FANLs / Plans

	Routii	ne TCR Sample Sch	edules	A A CONTRACT OF THE REAL PROPERTY.
Begin/End D	ate	Seasonal Period	D. W. H. W. H. G.	Requirements
RP TCR Schedules Fro	m E	То	SEARCH	
	Repea	it TCR Sample Sch	edules	
Begin Date	End Da	te Req	uirements	Original Sample ID/Date
Facility	GWR Triggered So Schedule	urce Sample Schedt Begin Date	ıles (Last 6 Mon End Date	nths) Initial MP Begin Date

GWR Follo	ow-up Triggered Source	Sample Schedules (Last (6 Months)
Facility	Schedule	Begin Date	End Date

			Group	o Non-	ГСR Sample Schedules
Facility	Begin End Date	Seas.	Init. MP Begin Dt	Req's	Analyte Group
02826005	01-01-2011 Continuous		01-01-2011	1 RT/YR	HM - HEAVY METALS
02826005	01-01-2014 Continuous		01-01-2014	1 RT/3Y	NRAD - NEW RAD RULE
02826005	01-01-2014 Continuous		01-01-2014	2 RT/3Y	RSOC - REGULATED SOCS
02826005	01-01-2012 Continuous		01-01-2012	1 RT/YR	<u>VOC1</u> - VOLATILE ORGANICS

			Individu	ıal Nor	-TCR Sample Schedules
Facility	Begin End Date	Seas	Init MP Begin Dt	Req.	Analyte

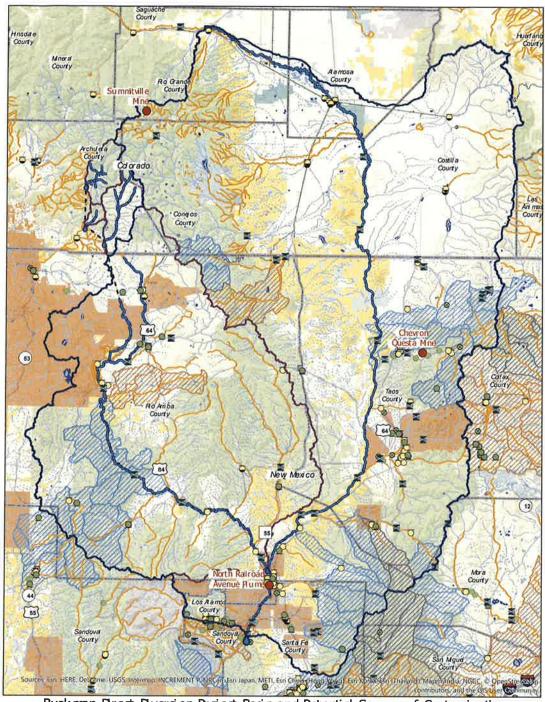
02826005	01-01-2011 Continuous	01-01-2011	1 RT/YR	1024-CYANIDE
02826005	01-01-2011 Continuous	01-01-2011	1 RT/YR	1025-FLUORIDE
02826005	01-01-2012 Continuous	01-01-2012	1 RT/YR	1038-NITRATE-NITRITE
02826005	01-01-2014 Continuous	01-01-2014	1 RT/3Y	4100-GROSS BETA PARTICLE ACTIVITY
02826005	01-01-2012 Continuous	01-01-2012	1 RT/YR	4102-TRITIUM
02826005	01-01-2012 Continuous	01-01-2012	1 RT/YR	4174-38-STRONTIUM-90

	Facility Analyte Levels(FANLS)									
Site	Analyte	Level Type	Value	Units	Days/Month	Samples/Day	Begin Date	End Date	MDBP Type	
02826002	0100	MAX	1	NTU	31	6	01-01- 2011	Continuous	MAXT	
02826002	0100	95P	0.3	NTU	31	6	01-01- 2011	Continuous	95PT	
02826002	0999	MIN	0.2	MG/L	31	24	01-01- 2011	Continuous	EPRD	

	Sample	Plans		S ESTABLE AND	A Francis
Rule	Analyte/Analyte Group	Eff. Begin	Eff. End	App. Date	For Comp.

Appendix E

BDD Basin PSOCs Map



Buckman Direct Diversion Project Basin and Potential Sources of Contamination

