Who?	Date Implemented?
Burney Water District	

Managed Forestlands – Modern Forestry and Silvicultural practices result in some of the healthiest watersheds in the world. However, some specific forestry activities can harm watersheds and groundwater aquifers. Improper chemical treatment to destroy weed species has the potential to impair drinking water quality by introducing regulated contaminants to the water source. Catastrophic events such as wildfire & wind-throw can open up the forest floor leading to increased sediment loading in streams during subsequent storms. Also, timber harvesting operations must be planned carefully and executed properly to avoid excessive sediment loading in streams.

Best Management Practices:
The Board and Staff of the Burney Water District should seek to cultivate a *partnership* type relationship with the several Forestry and Wood Products firms located within the protection zones. Indeed, land use in vast areas to the south of the community of Burney (upgradient) is primarily forestry related.

1. Facilitate informational meetings with the several large forestland owners to gain mutual understanding of the challenges inherent to public drinking water and forest management. Example: The regulated Maximum Contaminant Level for several common herbicides in drinking water is less than 1 part per billion.
2. Collaborate to publish information about the partnership to protect the community's water supply.

Suggest the following changes to the Managed Forests section:

1. "Improper chemical treatment to ~~destroy~~ control weed species has the potential to impair drinking water quality by introducing regulated contaminants to the water source."

Rational: Forestland managers do not "destroy", or even eliminate, weeds from a management area. Most treatments are only effective at controlling an acceptable level of any weed population, for a short (1 to 3 years) time, and on a small portion of a watershed (barring fire or wind-storm).

Improper treatment might cover the type, timing, rate, frequency, storage and handling. Improper rates would be "illegal", so unlikely to happen. Likewise on the storage and handling, which would only pose a hazard if spilled in a quantity to exceed containment provisions, also illegal and unlikely. Timing and rates for pest control applications are controlled by CA Licensed Pest Control Advisor written recommendations, CA Licensed Pest Control Applicators, and pesticide label requirements. The customary frequency of pest control activities is once or twice during a crop rotation of 50 to 80 years for evenaged methods and not at all for unevenaged stands.

2. "Also, timber harvesting operations must be planned carefully and executed properly to avoid excessive sediment loading in streams." California Forest Practice Rules, along with applicable Water Quality regulations ensure both, keeping the risk for this contamination lower than might exist in other regions of the country.

Rational: Both the planning and execution of harvesting operations takes place under the supervision of Registered Professional Foresters and Licensed Timber Operators. CalFire is the agency which enforces compliance with the interagency approved Timber Harvesting Plan (THP) and Forest Practice Rules. Annual reports evaluating compliance and effectiveness document high levels in both categories. Streams carry sediment and debris naturally, which includes increases in volume from episodic disturbance and water flows.

3. "Example: ~~The regulated Maximum Contaminant Level for several common herbicides in drinking water is less than 1 part per billion."~~ Knowledge of the location and protective infrastructure for Burney wells, both in service or abandoned, will enable forestland managers to incorporate appropriate protective measures into their plans for operations.

Rational: California's list of chemicals "having the potential to pollute ground water" is long, but the herbicides labeled for use in California Forest applications is short. Further narrowing the list to those that are "common" for the Burney forest landscape begins to make the example used misleading and less helpful than the replacement example. Information sharing and an environment of communication will promote the highest level of protection.

Burney Water District

SOURCE WATER PROTECTION PLAN

December 2016

Burney Water District
SOURCE WATER PROTECTION PLAN

December 2016

Prepared for:
Burney Water District

Prepared by: John Wendele

California
Rural Water Association

Burney Water District

Adopted by the Source Water Protection Plan Steering Committee:

Willie Rodriquez
Burney Water District – District Manager

Date

Fred Ryness
Burney Water District – Board President

Date

Keith Greenwood
Sierra Pacific Industries – Burney District Forester

Date

Primary Contact

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California Rural Water Association
1234 North Market Boulevard
Sacramento, CA 95834
Cell: (530) 917-4449
jwendele@calruralwater.org

Our Mission: We are committed to providing a safe and reliable water supply, environmentally safe disposal of wastewater, and responsible governance of our pools and park.

Introduction

Background

In 1996, the Safe Drinking Water Act (SDWA) was amended to require that each state develop and implement a source water assessment program.

California Department of Public Health responded to this amendment by creating and implementing the Drinking Water Source Assessment and Protection (DWSAP) Program[1] to evaluate each drinking water source in the state. This evaluation includes a determination of how susceptible each drinking water source is to contamination and uses these key elements as the basis for the assessment:

- A delineation of the area around a drinking water source through which contaminants might move and reach that drinking water supply.
- An inventory of possible contaminating activities (PCAs) that might lead to the release of microbiological or chemical contaminants within the delineated area.
- A determination of the PCAs to which the drinking water source is most vulnerable.

California Department of Public Health has overseen the completion of assessments for every drinking water source in the state. Considering that the potential threats to the sources of drinking water have been identified, the natural extension to the assessment is the development of a source water protection plan.

Purpose

A source water protection plan is a document, created with the assistance of members of the community, which identifies possible contaminating activities within drinking water source protection areas and provides specific recommendations to manage these potential threats in order to maintain quality drinking water. The recommendations necessary to make this document viable include:

- Prevention of Possible Contaminating Activities (PCAs)
- Contingency planning in the event of a water supply emergency
- Community education and outreach

Why Source Water Protection?

1. **Because the most cost-effective method to ensure the safety of the drinking water supply is to protect the source from contamination.**
2. **Because it is part of a "multi-barrier" approach to providing safe drinking water; treatment alone cannot always be successful in removing contaminants.**
3. **To improve public perception of the safety of drinking water.**
4. **Because safe drinking water is essential to the public health and economic well-being of communities.**

Why Source Water Protection

The Safe Drinking Water Act (SDWA) was passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. Amendments to the law in 1986 and 1996 require many actions to protect drinking water and its sources.

Originally, SDWA focused primarily on treatment as the means of providing safe drinking water at the tap. The 1996 amendments recognized source water protection as a major component of safe drinking water. Essential pieces of this component include protection and prevention. States and water suppliers must conduct assessments of water sources determine areas of vulnerability to contamination. Water systems may also voluntarily adopt programs to protect their watershed.

SDWA applies to every public water system in the United States. Responsibility for ensuring public water systems provide safe drinking water is divided among US EPA, states, tribes, water systems, and the public. SDWA provides a framework in which these parties work together to protect this valuable resource.

The California Department of Public Health [1] (CDPH) regulates all large water systems greater than 200 connections and was delegated by the state as primary authority for small water systems in 34 of California's 58 counties.

CDPH developed the Drinking Water Source Assessment & Protection Plan (DWSAP), to assist these small water systems. In each assessment, CDPH delineates protection zones that represent the area that would be likely to contribute water to the source within a specified time-of-travel (2, 5, or 10 years) for contaminant movement within the protection area.

The Source Water Protection Program is a voluntary program implemented at the local level to build local stewardship out of DWSAP activities conducted by CDPH. An implemented Source Protection Plan helps protect drinking water resources from contamination by pulling together a broad coalition of active stakeholders and providing guidelines for monitoring land use within the protection area surrounding the drinking source. The planning document considers past, current and future use of the watershed surrounding the drinking water source in making its actions.

Many materials - pesticides, fertilizers, organic chemicals, and human and animal wastes can contaminate water. Using existing protection tools, such as mandated DWSAPs and Sanitary Surveys and drawing on a broad coalition of committed stakeholders, a Source Water Protection (SWP) Plan identifies water system vulnerabilities and describes techniques to manage potentially contaminating activities, land uses and events; outlining a structured approach to managing potential sources of contamination within the source protection area (SPA). A SWP must have buy-in from the agencies who will implement its strategies, and it must be routinely reviewed and updated to remain current and viable.

Source protection planning benefits include:

- Increased consumer awareness about drinking water sources
- Creation of consumer confidence that a drinking water source will continue to be protected and reliable;
- Reduction of risk of contamination incidents with costly and/or potentially harmful results;
- Fostering of positive, proactive relationships with regulatory agencies, water system operators and the public
- Documentation of groundwork to support financial assistance proposals on behalf of the watershed.

Groundwater a Hidden Resource

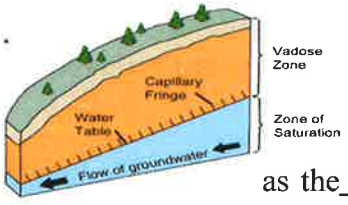
Water. It's vital for all of us. We depend on its good quality-and quantity-for drinking, recreation, use in industry and growing crops. It also is vital to sustaining the natural systems on and under the earth's surface.

Groundwater is a hidden resource. At one time, its purity and availability were taken for granted. Now contamination and availability are serious issues. The importance of groundwater has been confirmed many times. Scientists estimate groundwater accounts for more than 95% of all fresh water available for use. Approximately 50% of Americans obtain all or part of their drinking water from groundwater. Nearly 95% of rural residents rely on groundwater for their drinking supply. About half of irrigated cropland uses groundwater. Approximately one third of industrial water needs are fulfilled by using groundwater. About 40% of river flow nationwide (on average) depends on groundwater.

Thus, groundwater is a critical component of management plans developed by an increasing number of watershed partnerships.

Groundwater ABCs

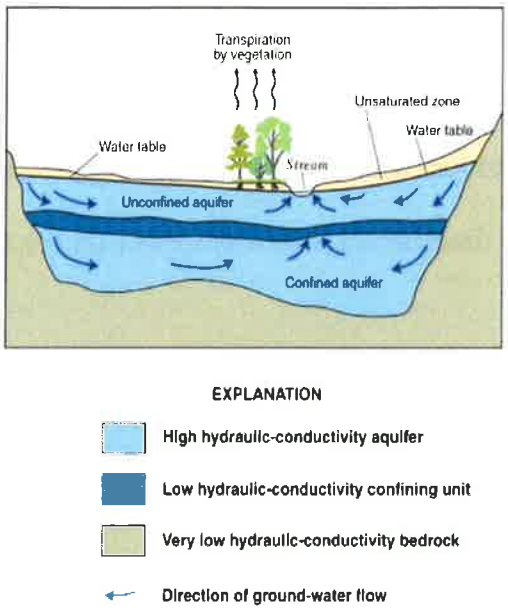
Groundwater is the water that saturates the tiny spaces between alluvial material (sand, gravel, silt, clay) or the crevices or fractures in rocks.



Aeration zone: The zone above the water table is known as the zone of aeration (unsaturated or vadose zone; also termed as the unsaturated zone).Water in the soil (in the ground but above the water table) is referred to as soil moisture. Spaces between soil, gravel and rock are filled with water (suspended) and air.

Capillary water: Just above the water table, in the aeration zone, is capillary water that moves upward from the water table by capillary action. This water can move slowly in any direction, from a wet particle to a dry one. While most plants rely on moisture from

precipitation that is present in the unsaturated zone, their roots may also tap into capillary water or into the underlying saturated zone.



Aquifer: Most groundwater is found in aquifers- underground layers of porous rock that are saturated from above or from structures sloping toward it. Aquifer capacity is determined by the porosity of the subsurface material and its area. Under most of the United States, there are two major types of aquifers: confined and unconfined.

Confined aquifers (also known as artesian or pressure aquifers) exist where the groundwater system is between layers of clay, dense rock or other materials with very low permeability.

Water in confined aquifers may be very old, arriving thousands of years ago. It's also under more pressure than unconfined aquifers. Thus, when tapped by a well, water is forced up, sometimes above the soil surface. This is how a flowing artesian well is formed.

Unconfined aquifers are more common and do not have a low-permeability deposit above it. Water in unconfined aquifers may have arrived recently by percolating through the land surface. This is why water in unconfined aquifers is often considered very young, in geologic time.

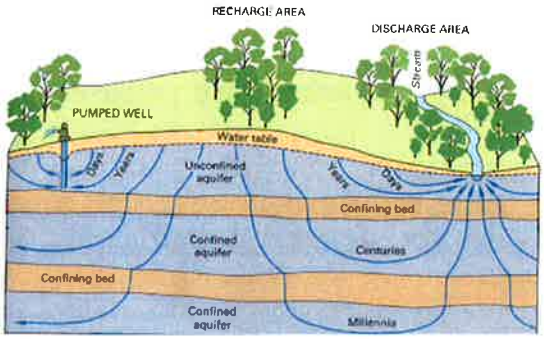
In fact, the top layer of an unconfined aquifer is the water table. It's affected by atmospheric pressure and changing hydrologic conditions. Discharge and recharge rates depend on the hydrologic conditions above them.

Saturation zone: The portion that's saturated with water is called the zone of saturation. The upper surface of this zone, open to atmospheric pressure, is known as the water table (phreatic surface). The earth's crust can be divided into two regions: the *saturated zone* or *phreatic zone* (e.g., aquifers, aquitards, etc.), where all available spaces are filled with water, and the *unsaturated zone* (also called the vadose zone), where there are still pockets of air that can be replaced by water. The term **phreatic** is used in geology to refer to matters relating to underground water below the water table (the word originates from

the Greek *phrear, phreat-* meaning "well" or "spring"). "Phreatic surface" is a synonym for "water table".

The **phreatic zone** is the layer(s) of soil or rock below the water table in which voids are permanently saturated with groundwater, as opposed to the higher *vadose zone* in which the pore spaces are not completely filled with water.

Water-bearing rocks: Several types of rocks can hold water, including:
Sedimentary deposits (i.e. sand and gravel)
Channels in carbonate rocks (i.e. limestone)
Lava tubes or cooling fractures in igneous rocks
Fractures in hard rocks



How Groundwater and Surface Water connect

It's crystal clear. Groundwater and surface water are fundamentally interconnected. In fact, it is often difficult to separate the two because they "feed" each other. This is why one can contaminate the other.

A way to study this connection is by understanding how water recycles in the hydrologic (water) cycle.

As rain or snow falls to the earth's surface, some water runs off the land to rivers, lakes, streams and oceans (surface water). Water also can move into those bodies by percolation below ground. Water entering the soil can infiltrate deeper to reach groundwater which can discharge to surface water or return to the surface through wells, springs and marshes. Here it becomes surface water again. And, upon evaporation, it completes the cycle. This movement of water between the earth and the atmosphere through evaporation, precipitation, infiltration and runoff is continuous.

How groundwater "feeds" surface water
One of the most commonly used forms of groundwater comes from unconfined shallow water table aquifers.

These aquifers are major sources of drinking and irrigation water. They also interact closely with streams, sometimes flowing (discharging) water into a stream or lake and sometimes receiving water from the stream or lake.

An unconfined aquifer that feeds streams is said to provide the stream's base-flow. This is called a gaining stream. In fact, groundwater can be responsible for maintaining the hydrologic balance of surface streams, springs, lakes, wetlands and marshes.

It is for this reason that successful watershed partnerships with a special interest in a particular stream, lake or other surface water body always have a special interest in the unconfined aquifer, adjacent to the water body.

How surface water "feeds" groundwater

The source of groundwater (recharge) is through precipitation or surface water that percolates downward. Approximately 5-50% (depending on climate, land use, soil type, geology and many other factors) of annual precipitation results in groundwater recharge. In some areas, streams literally recharge the aquifer through stream bed infiltration, called losing streams. Left untouched, groundwater naturally arrives at a balance, discharging and recharging depending on hydrologic conditions.

Defining Combined Boundaries

Partnerships using the watershed approach to protect natural resources identify and understand the individual resources-water, soil, air, plants, animals and people-early in the process.

This is why watershed partnerships select or define boundaries to address all natural resources - not just one. They realize that groundwater, surface water, air quality, and wildlife and human activities all affect each other.

Occasionally watershed partnerships run into difficulty combining boundaries of surface water (watersheds) and recharge areas (groundwater). One option is to consider combining surface and groundwater into a single, larger area. In other situations-for example if water is being transferred from one watershed or aquifer to distant users-there can be, and should be, two distinct areas.

Thus, watershed partnerships' boundaries may combine the wellhead area, aquifer, watershed, or many other areas depending on the issue(s).

Figure 1: Hydrologic Cycle

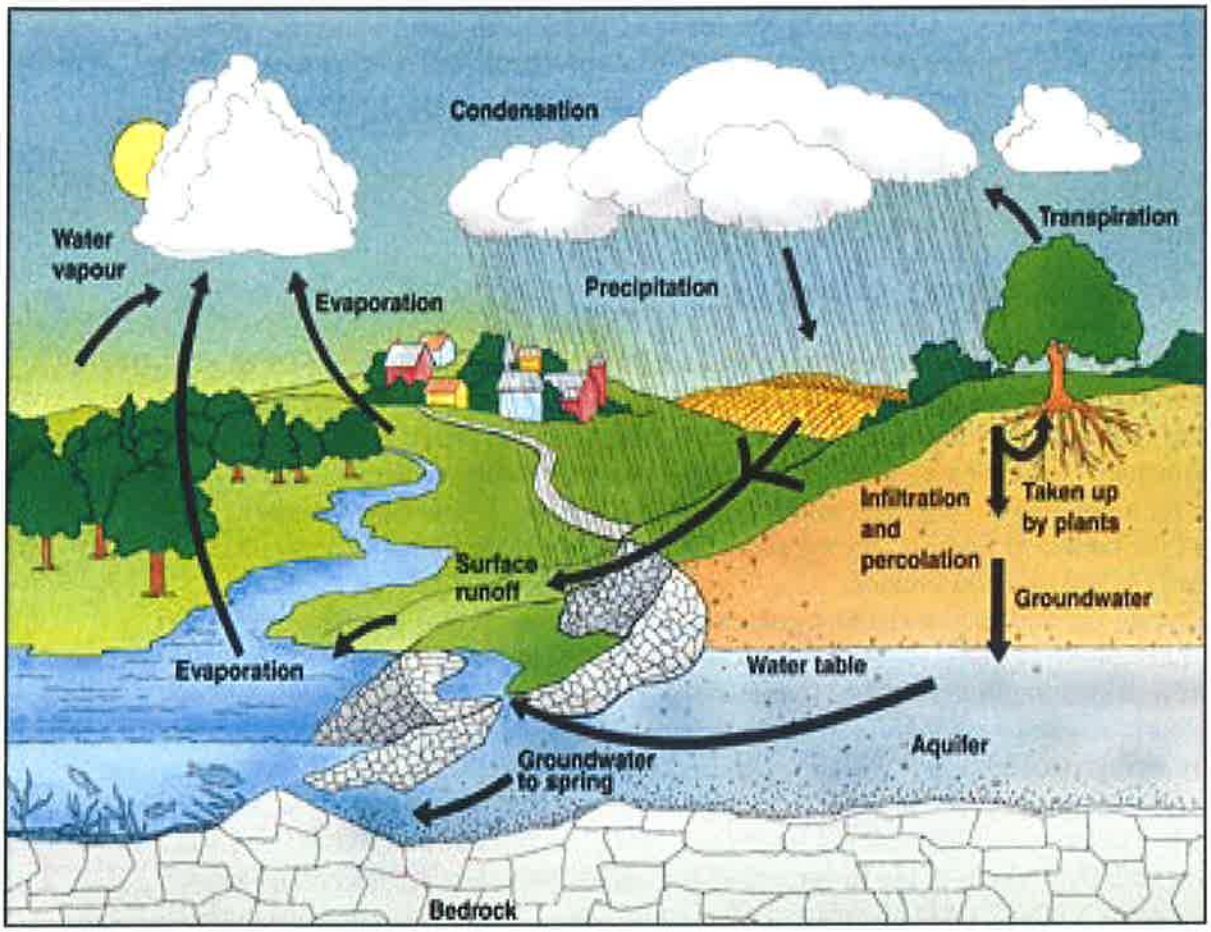


Figure 1 represents a general illustration of the hydrologic cycle that occurs in the Yucaipa area. This illustration is by no means site specific and is simply being used as a reminder of how groundwater and surface water are influenced by this natural cycle.

Description

Plan Area

The Burney Water District is located in the town of Burney, in the County of Shasta, California. The District office is located at 20222 Hudson Street. The service area covers approximately 2.6 square miles, all land. The system serves approximately 3,150 customers via 1,313 service connections.

History

A Brief Early History of Burney, California

The town of Burney received its name from an event that occurred in March of 1859 when, according to The Shasta Republican newspaper dated 2 April 1859, some men were returning to Shasta from the Pit river valley where they had "been snowed in" during the winter. On their way down, they passed the place lately located by Mr. Predmore for a ranch about eighteen miles west of Fort Crook. It was here that they discovered the bodies of Samuel Burney and a Sacramento Valley Indian boy who had been recently killed by local Indians.

The men buried the bodies in a shallow grave northwest of the present-day Shasta County Sheriff's substation. In 1887, R. M. (Dick) Johnson and others moved Burney's remains to their present location in the Burney Cemetery on Mountain View road. The grave today is clearly marked with a gravestone; however, the death date on the stone is incorrectly written as 1857.

For some time after this event, the area was know as "the valley where Burney was killed". Mr. Predmore left his land too long unoccupied, so William L. Cayton (who had been living with the Indians at the lower end of the valley, (which bears his name today) came to "Burney Valley'" and Occupied the Predmore site. Cayton was granted a patent on that l60 acres on 1 April 1871. He also acquired 160 acres of adjoining land from L. L. Y. Hastings, who received a patent on it May of 1872; both patents were signed by President Grant.

In 1872 Cayton sold all 320 acres to A.S.A. White for $5000. Mr. White also acquired 440 more acres of adjoining land. On 3 July 1877 he sold all 760 acres to John M. Kelly for $12,000. Three months later, Kelly sold the 760 to brothers D.C. and R.M. Johnson for $10,000 – a $2000 loss.

Until 1887, the area was one big farm with a huge orchard, potato fields, hay fields and a big garden that grew every kind of vegetable one could want, which Mr. White had planted. The first post office in the area was named Burney Valley and was established on 6 December 1872. Henry Murphy was the first postmaster; and it was located at "bunker hill" which was in the same building that also served as a stage stop, trading post and saloon.

It was R. M. Johnson who gave Samuel Burney's name to the mountain, creek and falls, and consequently, the town became Burney. After the death of D. C. Johnson, his widow and R. M. Johnson sold the 760 acres to Dr. C. W. Pierce for $8863 on 16 April

1881. Dr. Pierce and A. W. Gale opened a general merchandise store, hotel and post office in the 1880's that was located along main street.

Local Historian: Thelma Shiplet
Source Credit: Burney Chamber of Commerce

Hydrology & Geology

Sacramento River Hydrologic Region California's Groundwater
Burney Creek Valley Groundwater Basin Bulletin 118
Last update 2/27/04

Burney Creek Valley Groundwater Basin

- Groundwater Basin Number: 5-48
- County: Shasta
- Surface Area: 2,350 acres (4 square miles)

Basin Boundary and Hydrology

The Burney Creek Valley Groundwater Basin consists of Quaternary lake deposits bounded to the west by north trending faults. The basin is bounded on all sides by Pleistocene basalt (Gay 1958). Burney Creek drains the valley to the north. Annual precipitation is approximately 27 inches.

Hydrogeologic Information

Hydrogeologic information was not available for the following:

Water-Bearing Formations
Groundwater Level Trends
Groundwater Storage
Groundwater Budget (Type B)

The estimate of groundwater extraction for Burney Creek Valley Basin is based on a 1995 survey conducted by the California Department of Water Resources. The survey included land use and sources of water. Groundwater extraction for municipal and industrial uses is estimated to be 790 acre-feet. Deep percolation of applied water is estimated to be 490 acre-feet.

Groundwater Quality

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	0	0
Radiological	0	0
Nitrates	1	0
Pesticides	0	0
VOCs and SVOCs	0	0
Inorganics – Secondary	0	0

1 A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).

2 Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.
3 Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.
Sacramento River Hydrologic Region California's Groundwater
Burney Creek Valley Groundwater Basin Bulletin 118
Last update 2/27/04

Well Characteristics

Well yields (gal/min)
Municipal/Irrigation NKD
Total depths (ft)
Domestic Range: 55 – 395 Average: 205 (23 Well Completion Reports)
Municipal/Irrigation Range: 181 – 408 Average: 295 (2 Well Completion Reports)
NKD – No Known Data

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
Groundwater levels	NKD	
Miscellaneous water quality	NKD	
Department of Health Services	Miscellaneous water quality	2

NKD - No Known Data

Basin Management

Groundwater management: Shasta County adopted a groundwater management ordinance in 1998.
Water agencies
Public Burney WD
Private

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Description of Water Supply

The Burney Water District currently has three wells in production, all of which are active. Wells 6 & 7 are the primary producers while Well 8 is used for peak demand and fire flow. All three active wells are located on a single parcel and all drilled into the same aquifer. Therefore, the District has but a single source of water, the Burney Groundwater Basin. Given that the wells are located on the single parcel, with very limited separation, the District has no alternative source of water if the aquifer were to be contaminated. The production wells are configured to deliver water to two separate pressure zones. The low pressure zone is the largest of the two. The Burney Water District does not treat its water, and is not required to practice continuous disinfection. Chlorination feed equipment is on hand to deal with any foreseeable bacteriological contamination event.

Burney Water District Office

Well #6

ID#: 4510003-003

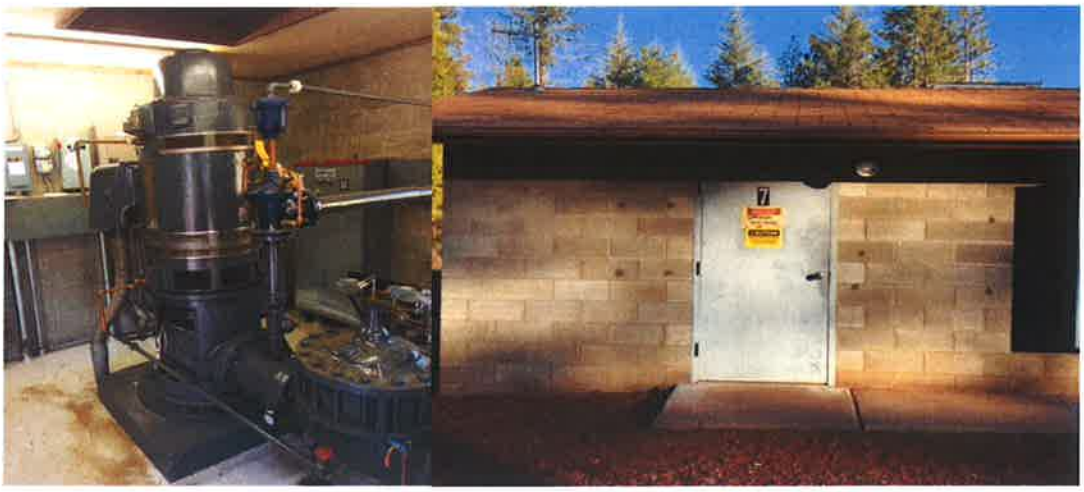
Well 6 is a 16-inch diameter well located on the well-field parcel located at the south-central extremity of the District boundary. The well was constructed in 1969 using the cable-tool method to a total depth of 297 feet. The annual seal extends from the surface to 242 feet below ground surface. The 50 feet of production zone is screened from 242-292 feet below ground surface. The Byron-Jackson vertical turbine pump is driven by a 200 horsepower General Electric 3-phase / 480 volt motor.

Well #6 Pump-house and Vertical Turbine Pump

Well #7

ID#: 4510003-004

Well #7 is a 16-inch diameter well located on the well-field parcel located at the south-central extremity of the District boundary. The well was constructed in 1982 using the cable-tool method to a total depth of 300 feet. The annual seal extends from the surface to 50 feet below ground surface and is constructed of cement grout. The 50 feet of production zone is screened from 250-300 feet below ground surface. The Byron-Jackson vertical turbine pump is driven by a 250 horsepower General Electric 3-phase motor.



Well #7 Pump-house and Vertical Turbine Pump

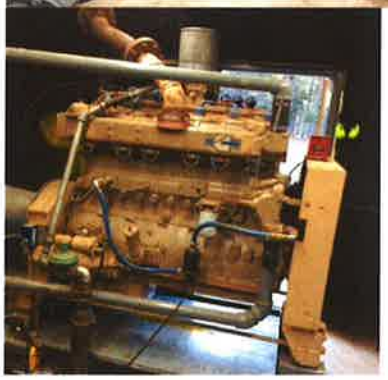
Well #8

ID#: 4510003-005

Well #8 is a 12-inch diameter well located on the well-field parcel located at the south-central extremity of the District boundary. The well was constructed in 1982 using the cable-tool method to a total depth of 300 feet. The annual seal extends from the surface to 50 feet below ground surface and is constructed of cement grout. The 50 feet of production zone is screened from 250-300 feet below ground surface. The vertical turbine pump is manufactured by the National Pump Company and is driven by a 200 horsepower internal combustion engine using natural gas as fuel. The pump shaft is driven by a right-angle drive receiving rotational power from the horizontal drive shaft.

Well #8 Pumphouse

Right-angle drive and vertical turbine pump



200 horsepower internal combustion engine (natural gas fueled)

TABLE 1: Water System & Source Summary				
Well 6				
System #		**Population**	**Connections**	
4510003		3,120	1,300 (low pressure zone)	
Source Name	**Source #**	**Type**	**Yield (GPM)**	**Max. GPD**
Well 6	4510003-003	Ground	1,400	2,000,000
Well 7				
System #		**Population**	**Connections**	
4510003		883	368 (high pressure zone)	
Source Name	**Source #**	**Type**	**Yield (GPM)**	**Max. GPD**
Well 7	4510003-004	Ground	1,740	2,500,000
Well 8				
System #		**Population**	**Connections**	
4510003		3,120	1,300 (low pressure zone)	
Source Name	**Source #**	**Type**	**Yield (GPM)**	**Max. GPD**
Well 8	4510003-005	Ground	1,500	2,160,000

Source Protection Area

Definition

A Source Protection Area is the surface and subsurface area from or through which contaminants are reasonably likely to reach a drinking water source. The purpose of delineating a Source Protection Area is to identify the area that supplies water to the public water source and determine which contaminants pose the greatest threat. Within a Source Protection Area, land uses and/or naturally occurring materials may cause a drinking water source to become vulnerable to contamination. While naturally occurring contaminants can usually be controlled by treatment methods, potentially contaminating land uses need to be managed by implementing measures outlined in a Source Water Protection Plan.[4]

Delineation of Sources

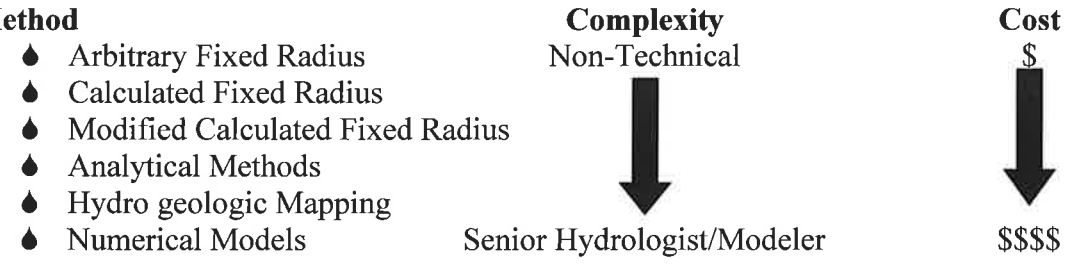
In order to establish the Source Protection Area, the susceptible area around each source needs to be defined. Included in the Drinking Water Source Assessment and Protection Program, performed by California Department of Health Services, is a vulnerability analysis conducted by delineating protection zones around each drinking water source.

Protection Zones

All drinking water source delineation distances are determined by potential contaminant proximity and/or expected time-of-travel to the water supply. However, there is a distinction between surface water and groundwater.

Groundwater

For groundwater sources, there are six primary delineation methods that were used by California Department of Public Health which include:



The delineation is divided into three different classifications with a minimum radii distance for each:

600 feet for **Zone A** (microbiological)
1,000 feet for **Zone B5** (chemical)
1,500 feet for **Zone B10** (chemical)

For fractured rock aquifers, the minimum radii are:

900 feet for **Zone A** (microbiological)
1,500 feet for **Zone B5** (chemical)
2,250 feet for **Zone B10** (chemical)

Protection Zones Glossary

Zone A: Is defined by a **two-year** time of travel. Purpose is to protect the drinking water supply from viral, microbial, and direct chemical contamination.

Zone B5: Is defined by a **five-year** time of travel. Purpose is to provide for more response time for chemical spills than Zone A.

Zone B10: Is defined by a **ten-year** time of travel. Purpose is to allow for recognition of the long-term aspects of potential contamination.

TABLE 2: Ground/Sourcewater Delineation

Water System	Source Name	Calculated Fixed Radius (fractured rock)	ModifiedCalculated Fixed Radius (fractured rock)	Zone	Radius (feet)
Burney Water District	Wells 6,7,and 8	X		A	2,765
				B5	4,404
				B10	6,228
Burney Water District (upgradient)	Wells 6,7,and 8		X	A	4,177
				B5	6,606
				B10	9,346
Burney Water District (downgradient)	Wells 6,7,and 8		X	A	1,393
				B5	2,202
				B10	3,354

Notes for Clarification:

1. It is well documented in the supporting literature that groundwater flow in the Burney Groundwater Basin is south to north. Basically, groundwater flows from the mountains to the south of Burney northward and downgradient similarly to the flow of Burney Creek with much of the groundwater surfacing as spring flow at Burney Falls and Lake Britton.
2. Any potential contamination event south of the Burney Water District is much more likely to impact water quality at the Districts' well field than a contamination event north and downgradient of Burney.
3. This sourcewater protection plan utilizes the Modified Calculated Fixed Radius method of determining the area to be protected. In other words, the three zones of protection extend much further upgradient of the District's well field than downgradient of the well field.

4. Please see the map of the area to be protected on the following page.
   a. Zone A is an illustration of the area to be protected given a 2-year time of transit.
   b. Zone B5 is an illustration of the area to be protected given a 5-year time of transit.
   c. Zone B10 depicts the area to be protected given a 10-year time of transit.
5. Again, please refer to the map on the following page.
   a. Zone A (two year transit time) is a circular area with a diameter of 5,570 feet with the center of the circle offset upgradient by a factor of 1.5 times the radius of a Zone A protection zone in a fractured rock aquifer without well documented gradient flow. Total area within Zone A = 0.87 square miles or 557 acres.
   b. Zone B5 (five year transit time) is a circular area with a diameter of 8,808 feet with the center of the circle offset upgradient by a factor of 1.5 times the radius of a Zone B5 protection zone in a fractured rock aquifer without well documented gradient flow. Total area within Zone B5 = 2.18 square miles or 1,395 acres.
   c. Zone B10 (ten year transit time) is a circular area with a diameter of 12,699 feet with the center of the circle offset upgradient by a factor of 1.5 times the radius of a Zone B10 protection zone in a fractured rock aquifer without well documented gradient flow. Total area within Zone B10 = 4.54 square miles or 2,906 acres.

Assessment of Threats

Definition

The assessment of threats consists of current and future vulnerabilities in the Source Protection Areas. Using the Drinking Water Source Assessments, information was compiled for the Burney Water District concerning zoning and land uses associated with activities that either are, or could threaten the quantity or quality of the area's water supplies.

Possible Contaminating Activities

These potential and known threats to the drinking water sources were determined from the Drinking Water Source Assessment and Protection Program and/or field observations from water system personnel:

TABLE 3: Possible Contaminating Activities (PCAs)

	Zone A	Zone B5	Zone B10
Sewer Collection System	X (High Risk)	X (Low Risk)	X (Low Risk)
High Density Housing	X (Moderate Risk)		
Parks		X (Moderate Risk)	
Apartments & Condominiums	X (Low Risk)		
Managed Forests	X (Moderate Risk)	X (Moderate Risk)	X (Moderate Risk)
Water Supply Wells	X (Moderate Risk)		
Historic Railroad Right-of-way	X (Moderate Risk)	X (Moderate Risk)	X (Moderate Risk)
Roads & Streets	X (Low Risk)	X (Low Risk)	X (Low Risk)
Storm Water Detention Facilities	X (Moderate Risk)	X (Moderate Risk)	X (Moderate Risk)
Surface Water Streams / Lakes	X (Low Risk)	X (Low Risk)	X (Low Risk)

Best Management Practices

Definition

Best Management Practices (BMPs) refer to management measures or actions, based on the threat assessment, that reduce or eliminate the drinking water source's susceptibility to becoming contaminated. These measures consist of tactics implemented by land owners, business owners, water system staff, or members of the community.

PCAs & BMPs

The following Possible Contaminating Activities, and corresponding Best Management Practices, are the vulnerabilities of most concern.

Sewage Collection System – Sewage spills from overflows constitute a high risk for the Burney Water District Water System.

Best Management Practices:

1. Review and update the District's SOP for responding to sewage overflows.
2. Review the District's Capital Replacement Plan and possibly re-prioritize known trouble spots in the collection and treatment systems.
3. Review and update the District's Bacteriological Site Sampling Plan and the Standard Operating Procedure for compliance with the Revised Total Coliform Rule.

Who?	Date Implemented?
Burney Water District	

Abandoned Water Supply Wells – Wells not in use are a direct conduit to the aquifer used as the District's sole source water supply and could pose a threat if not regularly inspected and/or properly maintained.

Best Management Practices:

1. Cap and lock or properly destroy all abandoned wells owned or controlled by the District.
2. Conduct a mail-out survey of the community to identify the locations of abandoned wells within Zones A, B5, and B10. Require property owners to cap and lock or properly destroy abandoned wells.

High Density Housing – Concentrated residences in close proximity to water supplies could pose a threat to the quality of the water if homeowners participate in activities such as improper chemical disposal, and frequent fertilizer & pesticide applications.

Best Management Practices:

The District should launch a public information program that highlights the importance of protecting the community's sole water source.

1. All PCA materials should be stored away from storm water drainage areas.
2. All household hazardous wastes should be collected and properly disposed of.

3. Residents should be encouraged to properly dispose of waste oil and other fluids.

Who?	Date Implemented?
Burney Water District	

Managed Forestlands – Modern Forestry and Silvicultural practices result in some of the healthiest watersheds in the world. However, some specific forestry activities can harm watersheds and groundwater aquifers. Improper chemical treatment to control weed species has the potential to impair drinking water quality by introducing regulated contaminants to the water source. Catastrophic events such as wildfire & wind-throw can open up the forest floor leading to increased sediment loading in streams during subsequent storms. Also, timber harvesting operations must be planned carefully and executed properly to avoid excessive sediment loading in streams. California Forest Practice Rules, along with applicable Water Quality regulations ensure both, keeping the risk for this contamination lower than might exist in other regions of the country.

Best Management Practices:
The Board and Staff of the Burney Water District should seek to cultivate a *partnership* type relationship with the several Forestry and Wood Products firms located within the protection zones. Indeed, land use in vast areas to the south of the community of Burney (upgradient) is primarily forestry related.

1. Facilitate informational meetings with the several large forestland owners to gain mutual understanding of the challenges inherent to public drinking water and forest management. Example: Knowledge of the location and protective infrastructure for Burney wells, both in service or abandoned, will enable forestland managers to incorporate appropriate protective measures into their plans for operations.
2. Collaborate to publish information about the partnership to protect the community's water supply.

Who?	Date Implemented?
Burney Water District	

Raymond Berry Community Pool & Park – Pool chemicals kept onsite could compromise the drinking water source if used or stored incorrectly. Furthermore, a chemical delivery accident could create an unforeseen emergency for water system personnel. Materials spilled, leaked, or lost from storage tanks may accumulate in soil or be carried away in storm water runoff.

Best Management Practices:

1. Review and evaluate SOP's for safe chlorine storage and handling.
2. Assess the vulnerability of the pool and park facilities with regards to vandalism / break-in.
3. Limit the use of herbicides and pesticides within the park area

Who?	Date Implemented?
Burney Water District	

Transportation Corridors – A chemical or fuel delivery accident could create an unforeseen emergency for water system personnel and an immediate threat to the water supply. Materials spilled, leaked, or lost during an accident may accumulate in soil and make its way to the aquifer or be carried away in storm water runoff.

Best Management Practice:

1. Coordinate with public safety personnel to be informed of any chemical or fuel spills that occur on roads within any of the Protection Zones.
2. Review and update the District's SOP for responding to chemical / fuel spills

Who?	Date Implemented?
Burney Water District	

Storm Water Detention Facilities – Storm water detention facilities are designed to protect watersheds from high volume run-off from impermeable surfaces such as parking lots. When properly designed, constructed and maintained, these facilities reduce sediment loading to streams. However, storm water detention facilities require regular inspection and maintenance to prevent failure.

Best Management Practice:

1. Identify all storm water detention facilities that are located within the Protection Zones.
2. Request inspection and maintenance records for these facilities. Provide incentives to partner with the District in its efforts to protect the community's sole source of water. Example: Signage indicating the positive message that such facilities help protect the water supply.

Who?	Date Implemented?
Burney Water District	

Public Education and Outreach

Public education and outreach are some of the most effective actions a community can implement to protect their water supply. Most citizens are open to helping in the effort to protect their water supply, but many people are unaware of that their own behavior may cause great harm. It is recommended that the District publish some of the following internet links in their upcoming consumer confident reports to keep the general public informed:

EPA Recycling and Waste Homepage
http://www.epa.gov/epawaste/index.htm

Hazardous Waste Publications
http://www.epa.gov/epawaste/hazard/index.htm

Engine Oil Recycling
http://www.recycleoil.org

Disposal and Management of Leftover Paint
http://www.paintcare.org/drop-off-locations/

Non-Toxic Cleaning in the Home
http://www.ns-products.com/nontox.htm

Non-Point Source Protection for Kids
http://www.epa.gov/owowwtr1/NPS/kids/index.html

Septic Systems and Source Water Protection
http://water.epa.gov/infrastructure/drinkingwater/sourcewater/protection/index.cfm

Watershed Information
http://www.epa.gov/owow/watershed/why.html

Public Services

Fire & Rescue

Burney Fire Protection District
37072 Main Street
Burney, CA 96013
(530) 335-2212
Ray Barber, Fire Chief

Cal-Fire, Shasta-Trinity Unit
Station #14
Route 2, Box 7
Burney, CA 96013
(530) 335-2203

Law Enforcement and Office of Emergency Services

Shasta County Sheriff's Department
300 Park Marina Circle
Redding, CA 96001
(530) 245-6025

State Water Resources Control Board, Division of Drinking Water

District 2 – Lassen
364 Knollcrest, Suite 101
Redding, CA 96002
(530) 224-4800

Utilities: Power, Gas, and Trash

Pacific Gas & Electric
1-800-743-5000

Burney Disposal, Inc.
37484 B Cornaz Drive
Burney, CA 96013
(530) 335-2723

Transportation

Caltrans District 2
1657 Riverside Drive
Redding, CA 96001
(530) 225-3426

Contingency Plan

Source Water/Wellhead Protection
Contingency Plan for Providing
Alternative Drinking Water Supplies

For:

Burney Water District
PWS I.D. # 4510003

Primary Contact:
Willie Rodriguez, District Manager

Address:
20222 Hudson Street
Burney, CA 96013

Office Phone:
(530) 335-3582

Date of Plan:
December 31, 2016

Review and Update Annually

Date Reviewed	Reviewer	Changes or Comments

The purpose of this contingency plan is to establish and to keep up to date the procedures necessary to utilize alternative water supply sources in the event of contamination or loss of the existing source.

Section 2 DESCRIPTION OF THE WATER SYSTEM

Name of System: Burney Water District

Population Served: 3,154

Service Connections: 1,313

Sources of Supply: 3 Active Wells / Single Source Aquifer

Interconnections with other Public Water Systems: None

Storage of Finished Water: Three Storage Tanks with a total capacity of 6.7 MG

Sources of Power: Normal: PG&E Emergency: Natural Gas Fueled Engine

Actual Location of System Maps and Records: 20222 Hudson Street, Burney, CA 96013

Section 3 SUMMARY OF POTENTIAL SOURCE OF CONTAMINATION

A. Potential Sources of Contamination: Sewage Spills, Abandoned Wells, Managed Forestland

B. Other Sources of Contamination: Park & Pool, Storm Water Detention Facilities

C. Spill Response Activities: Willie Rodriquez, District Manager (530) 335-3582

Section 4 ALTERNATIVE WATER SUPPLY OPTIONS

1. Emergency Conservation (Implement Emergency Notification Plan) – Media, Door to door, post flyers, and phone calls
2. Emergency Treatment – Direct chlorination applied at well heads
3. Boil Water Order
4. Bottled Water

Section 5 PRIORITY WATER USERS AND CONSERVATION MEASURES

A. Customers that would be requested to voluntarily reduce or eliminate water use:

1) Residential – Landscape Irrigation

B. Select conservation measures to be implemented in the event of the need to reduce demand:

1) Public Notice

Section 6 PUBLIC EDUCATION / MEDIA RELATIONS

A. Primary spokesperson for the media and public comment in the event of a contamination incident:

Name: Willie Rodriguez
Title: District Manager
Address: 20222 Hudson Street, Burney, CA 96013
Work Phone: (530) 335-3582

B. Information Checklist to be conveyed to the public and media:

1. Name of water system: Burney Water District
2. Contaminant of concern and date: _____
3. Source of contamination: _____
4. Public health hazard: _____
5. Steps the public can take: _____
6. Steps the water system is taking: _____
7. Other information: _____

C. Media Contacts:

1. Newspapers – The Intermountain News
   (530) 725-0925

   Redding Record Searchlight
   (530) 243-2424

2. Television – KRCR
   (530) 243-7777

References:

[1] California Department of Public Health: California's Drinking Water Source Assessment and Protection (DWSAP) Program, Overview, 2004.
[2] History of the Burney Water District / F.E. Jarrett, Bill Suppa, Valerie Dickinson
[3] California Groundwater Bulletin 118: California Department of Water Resources
[4] Groundwater Resource Evaluation of the Burney Basin / CH2M Hill / October 1988
[5] Burney-Hat Creek Basins Project / United States Forest Service / February 2011