This section describes watershed and groundwater features within the project area, and addresses potential issues associated with storm drainage and flooding, groundwater extraction, site drainage design considerations, and storm water quality. There were three written comments received during the public review period for the Notice of Preparation regarding this topic:

- A letter to Shasta County from resident Kirk Sanders, dated July 31, 2009 indicated that the project may result in adverse impacts to surface waters.

- An undated letter to Shasta County signed by residents Ashley Wayman, Tim Wedan, and Barbara Wedan, received on August 3, 2009 indicated that the proposed project may result in adverse impacts to groundwater levels in the project vicinity.

- A letter to Shasta County from the California Regional Water Quality Control Board, Central Valley Region, dated July 21, 2009 indicated that the project may be required to obtain a Construction Storm Water Permit, a 404 Permit, and a State Water Quality Certification.

Information for this section was derived from the following sources:

- Geotechnical Report: SPI Cogeneration Facility (CGI Technical Services Inc., June 2007) (**Appendix I**);
- Hydrogeologic analysis for Expansion of Cogeneration Plant at Sierra Pacific Industries Anderson Facility (Lawrence & Associates, 14 December 2007, Revised April 7, 2010) (**Appendix E**);
- Screening Level Environment Site Assessment: Sierra Pacific Industries (SPI) Proposed Cogeneration Plant (Hanover Environmental Services Inc., 14 September 2009) (**Appendix H**);
- Shasta County Water Resources Master Plan (Shasta County, 1997);
- Groundwater Management Plan for the Redding Groundwater Basin (1998);
- Shasta County General Plan (Shasta County, 2004);
- City of Anderson General Plan (City of Anderson, May 2007);

3.7.1 EXISTING SETTING

DRAINAGE AND FLOODING

Existing Site Drainage

The site resides within the flood terrace of the Sacramento River, which is located immediately northeast of the site and parallels the site's northeast border. The topographic expression of the site has a gentle slope of approximately one to two percent to the northeast with an average elevation of approximately 420 feet above mean sea level. Disrupting the relatively planar and low gradient topographic expressions across the site are depressions formed by old log ponds and several surface drainage ditches.

Surface drainage across the site occurs as sheet flow into the surrounding log ponds and drainage ditches and is contained on the project site until it evaporates or percolates into the soil. In the past, SPI had allowed water from the site to discharge into the Sacramento River, adjacent to the SPI property. The SPI facility was regulated under Waste Discharge Requirements (WDRs) Order No. R5-2004-0100. Violations recorded were not for the API specifically but for the larger SPI property. SPI was cited for exceeding discharge limits of cadmium, copper and zinc into the Sacramento River. California Water Code (CWC) Section 13385 (j)(3) requires the Discharger to prepare and implement a pollution prevention plan pursuant to Section 13263.3 of the California Water Code. A pollution prevention plan addresses only those constituents that can be effectively reduced by source control measures. Cease and Desist Order No. R5-2004-101 required SPI to implement measures to achieve full compliance with WDR Order No. R5-2004-100 by July 1, 2009. According to the CVRWQCB, SPI has not discharged any stormwater or process water to the Sacramento River since July 2009, which brings SPI into compliance with this Order. The CVRWQCB is in the process of drafting new permit conditions for the SPI site, however, it is anticipated that in order to comply with the waste discharge requirements, SPI will continue to retain all stormwater and process water onsite, as indicated by SPI staff and CVRWQCB staff.

100-Year Floodplain

The 100-year floodplain denotes an area that has a one percent chance of being inundated during any particular 12-month period. Statistically, the risk of this area flooding is almost 40 percent in any 50-year period.

Floodplain zones are determined by the Federal Emergency Management Agency (FEMA) and used to create Flood Insurance Rate Maps (FIRMs). These tools assist cities and counties in mitigating flooding hazards through land use planning. FEMA also outlines specific regulations for any construction, whether residential, commercial, or industrial within 100-year floodplains. Lands within the FEMA-designated 100-year floodplain, or Zone A, are subject to mandatory flood insurance purchase as required by FEMA. The insurance rating is based on the difference between the base flood elevation (BFE), the average depth of the flooding above the ground surface for a specific area, and the elevation of the lowest floor. New construction and substantial improvements of residential structures are also required to "have the lowest floor (including the basement) elevated to or above the base flood level." Non-residential structures must have their utility systems above the BFE or be of flood-proof construction.

The most recent FIRM for the project area is dated June 16, 2006. As shown in Figure 3.7-1, the site is located on a flood terrace of the Sacramento River. According to the FIRM maps, the terrace encompassing the site has a 0.2% annual chance of flooding (equivalent to the 500 year flood). In addition to the 500-year floodplain identified by FEMA, small isolated areas of ponding water and flooding are expected on the project site in closed depressions and along drainage ditches located throughout the site during a 100-year flood event.

Dam Failure

As described in the Shasta County General Plan (2004), some areas of the County, including the project site, have the potential to be affected by dam failure inundation such as from the Whiskeytown and Shasta Reservoirs. Failure of Shasta Dam would result in the inundation of most of

Redding within less than an hour of failure. Within two hours, Anderson, areas in the vicinity of Anderson, and much of the Sacramento River Valley downstream of Redding would be inundated.

Given its smaller size and location relative to existing development, failure of Whiskeytown Dam would be less disastrous. Redding would not be affected, but over half of Anderson would be inundated within two hours of failure. A smaller portion of the Sacramento River Valley downstream of Clear Creek would also be inundated. The project site is not within the Dam Inundation Risk Area for Whiskeytown Dam as identified by the Governor's Office of Emergency Services. The site is at risk of inundation if Shasta Dam fails.

GROUNDWATER CONDITIONS

Groundwater Overview

Productive groundwater zones beneath the site and vicinity occur in the Tehama and Tuscan Formations. Wells in the vicinity of the site range in depth from less than 100 feet below ground surface (older domestic wells) to generally about 500 feet below ground surface, and pump from the Tehama or younger formations. Generally, water in the Tehama Formation occurs in a semiconfined to confined condition.

At the site, the large wells which supply the existing cogeneration facility (well #2a) and pond make-up water (wells #1 and #2a) are completed in the aquifer extending from 148 to at least 285 feet below ground surface. Groundwater generally moves west to east towards the Sacramento River in the site vicinity.

Explorations at the project site first encountered groundwater at an average depth of about 10 feet below ground surface. However, the depth to groundwater is expected to vary throughout the year and from year to year. Intense and long duration precipitation, modification of topography and cultural land uses such as water well usage, on site waste disposal systems, and water diversions can contribute to fluctuations in groundwater levels.

Basin Description

The project site is located in the southern part of the Redding basin, the northernmost subbasin of the Sacramento Valley. The Redding basin is filled with Tertiary-age sediments that are thickest in the central part of the valley and thin to the north, east and west. (DWR, 1964)

Because the project site is located neat the center of the basin, the deposits are relatively thick. The thickest section of sediments in the Redding groundwater basin underlies Cottonwood Creek in the vicinity of Cottonwood to a depth of 4,000 feet.

Geologic units occurring in the vicinity are, from youngest to oldest, recent stream deposits; the Pleistocene-age Modesto, Riverbank, and Red Bluff Formations; the Pliocene-age Tehama and Tuscan Formations; the Oligocene to late-Miocene-age Upper Princeton Gorge Formation; and the late-Jurassic to Cretaceous-age Great Valley Sequence or Chico Formation. (Helly, Harwood, 1985)

Each of these formations is described below.

- The recent stream deposits are found in the channel of the Sacramento River. These consist of unconsolidated gravel, sand, silt, and clay.

- The Modesto Formation consists of unconsolidated, slightly weathered gravel, sand, silt, and clay. The Riverbank Formation consists of unconsolidated to semi consolidated gravel, sand silt, and minor clay. The Modesto and Riverbank formations outcrop in the northern portion of the major drainages of the site.

- The Red Bluff Formation typically consists of distinctly reddish, clayey gravel with some sand. The Red Bluff Formation caps the hills across the site and in the vicinity.

- The Tehama Formation generally consists of interbedded clay, silt, sand, and gravel, or mixtures thereof, interpreted to be fluvial in origin (Pierce, 1983). The Tehama Formation is one of the principal water-bearing formations in the Sacramento Valley groundwater basin. The Tehama Formation generally is moderately to highly permeable, with moderate to high (100 to over 1,000 gpm) groundwater yields. The Tehama Formation immediately underlies most of the project site. Gravels in the Tehama Formation sediments are composed mainly of greenstone, with lesser quantities of metamorphic rock fragments, chert, and occasional granitic rock fragments. These rock types are typically found in the Klamath Mountains and the Coast Ranges to the west of the site, indicating that Tehama Formation sediments beneath the site are derived from these areas. Most of the gravel clasts are rounded to subrounded, resembling present-day gravels in Cottonwood Creek.

- Interfingering with the Tehama Formation is the Tuscan Formation. Sediment in the Tuscan Formation was derived from the volcanic terrains to the east of the Sacramento Valley, rather than the Coast Ranges. The Tuscan Formation consists of volcanic mudflow, ash beds, tuff, breccias, and tuffaceous sandstones and conglomerates. Four distinct units (A through D) have been mapped in the Tuscan Formation.

- Underlying the Tuscan Formation is the Upper Princeton Gorge Formation. The Upper Princeton Gorge Formation consists of non-marine sandstone with shale or conglomerate interbeds.

- Underlying the Tertiary-age units in the western part of the basin is the Great Valley Sequence or Chico Formation. These units consist of well consolidated to cemented, interbedded sandstone and shale. Generally, these units contain very poor quality water and have low groundwater yields.

Review of hydrographs from wells throughout the sub-basin and the Shasta County Water Resources Master Plan (1997) indicate that, the Redding groundwater basin is in "steady state", where inflows equal outflows. That is removal of water from the basin (from pumping or other means) does not exceed recharge to the basin. Changes in water level roughly correlate to changes in precipitation (recharge). During drought years water levels typically decline. When average to above average precipitation conditions prevail water levels increase.

Vicinity Well Yields

There are hundreds of wells in the project vicinity, but most are smaller domestic wells, which drillers indicate as having lower yields (mostly less than 50 to 100 gallons per minute). These yields generally reflect the wells' construction or the needs of the property owners for less water; these yields are not necessarily reflective of the aquifer's ability to yield more water (the aquifer's transmissivity).

The yields noted for irrigation or industrial wells generally are more indicative of the true nature of the aquifer's transmissivity. Based on the site wells and DWR data from the area, wells with yields of over 1,000 gallons per minute are not uncommon. Better constructed wells (e.g. gravel packed, with wire wrapped type screened casing), can have yields of up to 3,000 gallons per minute. Most of these higher yielding wells are located closer to the axis of the Redding groundwater basin.

Historical Groundwater Use at the Project Site

The Facility is currently home to three groundwater extraction wells:

- Well #1 (pipe shop well: domestic supply for facility and use as make-up water for log deck pond)
- Well #2 (no longer in use)
- Well #2a (main facility well)

At the site, the large wells which supply the existing cogeneration facility (Well #2a) and pond make-up water (Wells #1 and #2a) are completed in the aquifer extending from 148 to at least 285 feet below ground surface. Well #2, which is no longer in use, was sealed under the supervision of Shasta County Environmental Health Division staff in February 2009. The location of the above-referenced wells is shown in Figure 3.7-4. Groundwater generally moves west to east towards the Sacramento River in the site vicinity.

The Facility currently utilizes about 400 gallons per minute (645 acre-feet per year) from Well #2a to provide water for the operation of the existing cogeneration plant and sawmill.

SPI Site Aquifer and Well Testing

FIELD METHODS

Existing site wells were used for this analysis, which was completed by Lawrence and Associates. A 8-hour constant-discharge drawdown test was conducted on Well #2a, on November 24, 2007. The length and timing of the test was constrained by the need to use the well for Plant operations. The existing pump was used in the test. The well was pumped at an average discharge of 450 gpm (the limit of the existing pump); initial discharge was over 800 gpm, but declined to about 450 as pressure tanks and distribution lines were filled and provided back- pressure to the system. The discharge rate was measured using a totalizing flow meter with a digital readout, installed in the pump house for Well #2a.

Discharge was to the log-deck pond near the well. This pond, along with other ponds on the site, are generally kept relatively full and are an intrinsic feature of the site. Usually for an aquifer test, the discharge is routed some distance away from the well so that percolating discharge does not return to the well and decrease drawdown. In this case, however, because the ponds are a long-standing feature of the site and will remain in place after the expansion providing recharge to the subsurface, routing the test water to the nearby pond was not inappropriate.

Pressure transducers were installed in the Observation well (#2) and the Pipe Shop well (#1) on November 6, 2007. The transducers were wired to continuously recording data loggers. An obstruction in the casing of the Test well (Well #2a) prohibited installation of a transducer in that well. Water levels also were measured manually using 2-wire electric sounders. Recovery of water levels was recorded in the Observation and Pipe Shop wells for 48 hours after concluding the test.

Appendices B, C, and D of the attached Hydrogeologic Report prepared by Lawrence & Associates (**Appendix E**) contain the manual water-level data, transducer readings, and/or calculated water levels for the period of observation (before, during, and after pumping), for all wells. The manual water-level data is recorded on the calibration sheet for each test. The calibration sheets show the equations used to transform transducer readings to true water levels, based on the water levels measured manually.

Figures 8 through 12 in the attached Hydrogeologic Report (**Appendix E**) show the various graphs used to evaluate the aquifer test data. Figures 8 through 10 of the attached Hydrogeologic Report show graphs of depth to water for the Test, Observation, and Pipe Shop wells, respectively. Figures 11 and 12 of the attached Hydrogeologic Report show the Theis analysis of the data for the Test and Observation wells, respectively.

AQUIFER AND WELL TESTING RESULTS

Evaluation of aquifer-test data was performed using the commercially available AquiferTest ver. 4.0 software package from Waterloo Hydrogeologic, Inc. This software package is specifically designed for aquifer-test data analysis, and serves as an efficient means of applying several classic methods of data evaluation to a specific data set. Table 3.7-1 summarizes results from the aquifer testing.

The calculated transmissivity is between 20,000 and 40,000 square feet per day (from the Test and Observation wells, respectively). This transmissivity range equates to hydraulic conductivities of about 140 to 250 feet per day, based on the aquifer thickness of 153 feet. This is a relatively high hydraulic conductivity, reflecting the coarse-grained nature of the aquifer in this location.

The storativity ranged from 4.4×10^{-2}, to 7.1×10^{-2}, value typical of the semi-confined aquifers in the Redding groundwater basin.

The Observation well showed influence from the Pipe Shop well, in addition to influence from the Test well. The influence from the Pipe Shop well is delineated with green boxes on Figure 9 of the attached Hydrogeologic Report. The influence was about 6 inches for each one-day operation period of the Pipe Shop well. This data was not formally analyzed because the Pipe Shop well does not have a flow meter, and accurate flow data is necessary to calculate aquifer parameters.

TABLE 3.7-1: SUMMARY OF AQUIFER TESTING RESULTS

PARAMETER	*TEST WELL (2A)*	*OBSERVATION WELL (2)*
Discharge and length of test	450 gpm, 12 hours	
Maximum drawdown	4.2 feet	1.1 feet
Transmissivity, Theis method	21,400 feet^2/day	37,800 feet^2/day
Hydraulic Conducivity (transmissivity + aquifer thickness)	139 feet/day	245 feet/day
Storativity	2.45 x 10^{-2}	7.06 x 10^{-2}

SOURCE: HYDROGEOLOGIC ANALYSIS, ANDERSON COGENERATION PLAN (LAWRENCE, APRIL 2010)

Long Term Yield

Long-term yield of the test well (Well #2a) is at least 1000 gallons per minute.

Interference

Interference is the decrease in water level in a well caused by the pumping of a neighboring well. Different pumping rates and times cause different amounts of interference (a higher pumping rate and/or longer pumping duration cause more interference than a lower rate and/or shorter pumping time at any given distance). To evaluate the potential interference that project wells may cause, pumping rates and duration must be used in conjunction with the calculated aquifer coefficients to assess interference.

Figure 3.7-2 shows a graph of interference vs. distance for one well pumping at 430 gpm for 180 days (average pumping rate during 6-month dry season) and at 450 gpm for 30 days (the time of maximum pumping during the summer). Appendix E of the attached Hydrology Report contains the calculations, which are based on the Theis equation and the lower end of the calculated aquifer parameters from the site testing. Use of the Theis equation is very conservative in this instance, as it does not account for recharge. That is, it assumes that all pumped water comes from aquifer storage, and that none comes from recharge, such as infiltration of rainfall or irrigation water. Thus, it overestimates the amount of interference because local aquifer recharge will reduce interference. Additionally, using the lower end of the calculated aquifer parameters will yield more conservative interference results.

Figure 3.7-2 shows that at a distance of about ½ mile, the interference would be about one foot at the end of summer; at one mile the interference would be about 0.6 feet (7 inches). The interference from the 450 gpm pumping rate for only 30 days is less (about ½ foot at ½ mile and 2.5 inches at one mile).

Available Groundwater

The groundwater budget for the Redding basin was estimated in the *Shasta County Water Resources Master Plan*. Total inflow into the groundwater system of the Redding basin is estimated to be

293,600 acre-feet. Groundwater discharge from the basin is estimated to be about 37,000 acre-feet from pumping and 266,000 acre feet to surface streams.

The Redding groundwater basin is in "steady state", where inflows equal outflows. That is, removal of water from the basin (from pumping or other means) does not exceed recharge to the basin. Figure 14 in the attached Hydrogeologic Report (**Appendix E**), showing several hydrographs of wells near the Plant and in the vicinity, illustrates that the basin is in steady state because changes in water levels roughly correlate to precipitation (recharge): During drought (for example from 1987 to 1992), water levels decline. When precipitation returns to average or above average, water levels increase.

The total water demand in the Redding basin as of the date of the Shasta County Water Resources Master Plan (1997) was about 280,500 acre-feet. The projected demand in 2030 is about 342,500 acre-feet, or an increase of about 62,000 acre-feet. Conservatively assuming that all of the additional demand will be supplied by groundwater gives a total groundwater pumpage in 2030 of 99,300 acre-feet.

Drought and Water-Supply Sustainability

Regarding drought and the sustainability of the groundwater supply, Figure 14 in the attached Hydrogeologic Report shows hydrographs of several wells in the area of the SPI Plant (all from Township 30 North, Range 4 West). Hydrographs show the groundwater levels over time. Graphs for the wells in the project area show that water levels roughly correlate to precipitation – when there is less precipitation (drought), water levels decline and when there is more precipitation, water levels rise. These types of patterns show that the groundwater basin is in steady state, and is not overdrafted. If overdraft were occurring, water levels would continually decline, even when there was higher than normal precipitation.

The California Department of Water Resources (DWR) maps the difference between spring to spring groundwater levels as a measure of how aquifers are responding to changes in precipitation, pumping, or other factors that could affect water levels. For the most recent drought, DWR mapped the difference between spring 2006 and spring 2009 levels to illustrate how the last three dry years affected groundwater levels.

For wells up to 200 feet deep in the Redding basin, between 2006 and 2009 groundwater levels have declined between zero and seven feet. Most wells between 200 and 600 feet deep also show water levels between zero and seven feet lower; there is one well in the far northern part of the basin with higher water levels and one well with levels eight to 14 feet lower.

A well monitored by DWR near the SPI site illustrates the changes in water level in the project area caused by drought. Figure 15 in the attached Hydrogeologic Report shows a hydrograph for this well, State well number 30N04W05K001M. This well shows a spring-to-spring decline of about seven feet during the period 1986 though 1992 (the most recent extended drought). Between 2006 and 2009 (the most recent drought of shorter duration), the spring-to-spring water level declined about five feet, although the spring 2006 starting level was about three feet higher than average.

In addition to changes in water level from drought, there are seasonal changes in water level in this well of up to about five feet.

Groundwater Quality

The general quality of groundwater in the Redding Basin is considered good to excellent (TDS between 95 and 424 mg/L) for most uses, except for that water from shallow depths along the margin of the basin where pre-Tertiary formations may be tapped. Some wells in those areas yield water with constituents that are above limits for drinking (primarily metals, TDS, chloride and sulfate). This water is likely derived from the Chico Formation (Pierce, 1983).

3.7.2 REGULATORY SETTING

FEDERAL AND STATE

Clean Water Act (CWA)

The CWA, initially passed in 1972, regulates the discharge of pollutants into watersheds throughout the nation. Section 402(p) of the act establishes a framework for regulating municipal and industrial stormwater discharges under the NPDES Program. Section 402(p) requires that stormwater associated with industrial activity that discharges either directly to surface waters or indirectly through municipal separate storm sewers must be regulated by an NPDES permit. In California, the NPDES Program is administered by the State.

The SWRCB is responsible for implementing the Clean Water Act and does so through issuing NPDES permits to cities and counties through regional water quality control boards. Federal regulations allow two permitting options for storm water discharges (individual permits and general permits).

Federal Emergency Management Agency (FEMA)

Shasta county and the City of Anderson are participants in the National Flood Insurance Program (NFIP), a Federal program administered by FEMA. Participants in the NFIP must satisfy certain mandated floodplain management criteria. The National Flood Insurance Act of 1968 has adopted as a desired level of protection, an expectation that developments should be protected from floodwater damage of the Intermediate Regional Flood (IRF). The IRF is defined as a flood that has an average frequency of occurrence on the order of once in 100 years, although such a flood may occur in any given year. Communities are occasionally audited by the Department of Water Resources to insure the proper implementation of FEMA floodplain management regulations.

The regulations of the National Flood Insurance Program (NFIP), which is administered by FEMA, require that communities adopt land use restrictions for the 100-year floodplain in order to qualify for federally subsidized flood insurance. Included is a requirement that residential structures be elevated above the level of the 100-year flood and that other types of structures be flood-proofed. FEMA issues FIRMs for communities participating in NFIP. These maps delineate flood hazard zones in each participating community.

Shasta County participates in the National Flood Insurance Program and must therefore require development permits to ensure that construction materials and methods will mitigate future flood damage.

California Water Code

California's primary statute governing water quality and water pollution issues with respect to both surface waters and groundwater is the Porter-Cologne Water Quality Control Act of 1970 (Division 7 of the California Water Code) (Porter-Cologne Act). The Porter-Cologne Act grants the State Water Resource Control Board (SWRCB) and each of the RWQCBs power to protect water quality, and is the primary vehicle for implementation of California's responsibilities under the Federal Clean Water Act. The Porter-Cologne Act grants the SWRCB and the RWQCBs authority and responsibility to adopt plans and policies, to regulate discharges to surface and groundwater, to regulate waste disposal sites and to require cleanup of discharges of hazardous materials and other pollutants. The Porter-Cologne Act also establishes reporting requirements for unintended discharges of any hazardous substance, sewage, or oil or petroleum product.

Each RWQCB must formulate and adopt a water quality control plan (Basin Plan) for its region the regional plans are to conform to the policies set forth in the Porter-Cologne Act and established by the SWRCB in its State water policy. The Porter-Cologne Act also provides that a RWQCB may include within its regional plan water discharge prohibitions applicable to particular conditions, areas, or types of waste.

National Pollutant Discharge Elimination System (NPDES)

National Pollutant Discharge Elimination System (NPDES) permits are required for discharges of pollutants to navigable waters of the United States, which includes any discharge to surface waters, including lakes, rivers, streams, bays, the ocean, dry stream beds, wetlands, and storm sewers that are tributary to any surface water body. NPDES permits are issued under the Federal Clean Water Act, Title IV, Permits and Licenses, Section 402 (33 USC 466 et seq.)

The RWQCB issues these permits in lieu of direct issuance by the Environmental Protection Agency, subject to review and approval by the Environmental Protection Agency Regional Administrator (EPA Region 5). The terms of these NPDES permits implement pertinent provisions of the Federal Clean Water Act and the Act's implementing regulations, including pre-treatment, sludge management, effluent limitations for specific industries, and anti- degradation. In general, the discharge of pollutants is to be eliminated or reduced as much as practicable so as to achieve the Clean Water Act's goal of "fishable and swimmable" navigable (surface) waters. Technically, all NPDES permits issued by the RWQCB are also Waste Discharge Requirements issued under the authority of the CWC.

These NPDES permits regulate discharges from publicly owned treatment works, industrial discharges, stormwater runoff, dewatering operations, and groundwater cleanup discharges. NPDES permits are issued for five years or less, and are therefore to be updated regularly. The rapid and dramatic population and urban growth in the Central Valley Region has caused a significant increase in NPDES permit applications for new waste discharges. To expedite the permit issuance process, the RWQCB has adopted several general NPDES permits, each of which regulates numerous discharges of similar types of wastes. The SWRCB has issued general permits for stormwater runoff from construction sites statewide. Stormwater discharges from industrial and construction activities in the Central Valley Region can be covered under these general permits, which are administered jointly by the SWRCB and RWQCB.

Dischargers whose projects disturb 1 or more acres of soil or whose projects disturb less than 1 acre but are part of a larger common plan of development that in total disturbs 1 or more acres, are required to obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit, 99-08-DWQ). Effective July 1, 2010 all dischargers are required to obtain coverage under the Construction General Permit Order 2009-0009-DWQ adopted on September 2, 2009. Construction activity subject to this permit includes clearing, grading and disturbances to the ground such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility.

The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP must list Best Management Practices (BMPs) the discharger will use to protect storm water runoff and the placement of those BMPs. Additionally, the SWPPP must contain a visual monitoring program and a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs.

REGIONAL AND LOCAL

Water Quality Control Plan for the Central Valley Region

The Water Quality Control Plan for the Central Valley Region (Basin Plan) includes a summary of beneficial water uses, water quality objectives needed to protect the identified beneficial uses, and implementation measures. The Basin Plan establishes water quality standards for all the ground and surface waters of the region. The term “water quality standards,” as used in the Federal Clean Water Act, includes both the beneficial uses of specific water bodies and the levels of quality that must be met and maintained to protect those uses. The Basin Plan includes an implementation plan describing the actions by the RWQCB and others that are necessary to achieve and maintain the water quality standards.

The RWQCB regulates waste discharges to minimize and control their effects on the quality of the region’s ground and surface water. Permits are issued under a number of programs and authorities. The terms and conditions of these discharge permits are enforced through a variety of technical, administrative, and legal means. Water quality problems in the region are listed in the Basin Plan, along with the causes, where they are known. For water bodies with quality below the levels necessary to allow all the beneficial uses of the water to be met, plans for improving water quality are included. The Basin Plan reflects, incorporates, and implements applicable portions of a number of national and statewide water quality plans and policies, including the California Water Code and the Clean Water Act.

Shasta County General Plan

To minimize the risk of exposing people, property and the environment to, erosion flood hazards, and water resources, the Shasta County General Plan includes several policies and implementations that pertain to this project:

Dam Failure Objectives

- **DI-1** Reduction of the potential for the loss of life from dam failure inundation by developing emergency preparedness plans.

Dam Failure Policies

- **DI-a** Dam Failure Inundation Maps shall be maintained by the County to aid in the project review process.
- **DI-b** When development is proposed in areas adjacent to or downstream from an existing dam, the County shall determine if preparation of a dam failure inundation map is warranted.
- **DI-d** The Shasta County Emergency Plan shall provide for early warning and emergency evacuation routes in the event of dam failure.

Erosion Objectives

- **SG-4** Protection of waterways from adverse water quality impacts caused by development on highly erodible soils.

Erosion Policies

- **SG-d** Shasta County shall develop and maintain standards for erosion and sediment control plans for new land use development. Special attention shall be given to erosion prone hillside areas, including those with extremely erodible soil types such as those evolved from decomposed granite.
- **SG-f** Shasta County shall pursue preparation of development standards based on topography and soil erosion potential in revising its land capability standards pursuant to Policy CO-h.

Flooding Objectives

- **FL-1** Protection of public health and safety, both on-site and downstream, from flooding through floodplain management which regulates the types of land uses which may locate in the floodplain, prescribes construction designs for floodplain development, and requires mitigation measures for development which would impact the floodplain by increasing runoff quantities.

Flooding Policies

- **FL-a** New development in floodplains shall be regulated through zoning regulations addressing land use type, density, and siting of structures.

- **FL-c** Whenever possible, flood control measures should consist of channel diversions or limited floodplain designs which avoid alteration of creeks and their immediate environs.
- **FL-h** The impacts of new development on the floodplain or other downstream areas due to increased runoff from that development shall be mitigated. In the case of the urban or suburban areas, and in the urban and town centers, the County may require urban or suburban development to pay fees which would be used to make improvements on downstream drainage facilities in order to mitigate the impacts of upstream development.

Water Resource Objectives

- **W-9** Institute effective measures to protect groundwater quality from potential adverse effects of increased pumping or potential sources of contamination.

Water Resource Policies

- **W-a** Sedimentation and erosion from proposed developments shall be minimized through grading and hillside development ordinances and other similar safeguards as adopted and implemented by the County.
- **W-b** Septic systems, waste disposal sites, and other sources of hazardous or polluting materials shall be designed to prevent contamination to streams, creeks, rivers, reservoirs, or groundwater basins in accordance with standards and water resource management plans adopted by the County.
- **W-c** All proposed land divisions and developments in Shasta County shall have an adequate water supply of a quantity and a quality for the planned uses. Project proponents shall submit sufficient data and reports, when requested, which demonstrate that potential adverse impacts on the existing water users will not be significant. The reports for land divisions shall be submitted to the County for review and acceptance prior to a completeness determination of a tentative map. This policy will not apply to developments in special districts which have committed and documented, in writing, the ability to provide the needed water supply.
- **W-d** The potential for cumulative water quality impacts resulting from widespread use of septic systems in poorly suited soil areas shall be periodically evaluated by the County for the need to provide greater monitoring and possible changes to applicable sewage disposal standards.

Shasta County Groundwater Management Ordinance

Adopted in 1998, Shasta County Ordinance 98-1 officially adopted a groundwater management plan prepared by the Shasta County Water Agency pursuant to AB 3030 the Groundwater Management Act (California Water Code Section 10750 et seq.). The California Department of Water Resources has defined groundwater management plans as a “planned use of the groundwater basin yield, storage space, transmission capability, and water in storage.”

Shasta County Grading Ordinance

The Shasta County Grading Ordinance, included in the Shasta County Zoning Plan (Shasta County, 2003) sets forth regulations concerning grading, excavating, and filling. The Shasta County Grading Ordinance, among other thresholds, prohibits any grading of more than 250 cubic yards or 10,000 square feet of disturbance area without a grading permit from the County. The grading permit must include an approved grading plan provided by the project applicant, and it must set forth terms and conditions of grading operations that conform to the County's grading standards. The permit also requires the project applicant to provide a permanent erosion control plan that must be implemented upon completion of the project. Ongoing maintenance of erosion control measures is required for the duration of the project and for three years after completion of the project, unless the project is released earlier by the enforcing officer designated by the County Board of Supervisors.

3.7.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed project will have a significant impact on the environment associated with hydrology and water quality if it will:

- Violate any water quality standards or waste discharge requirements;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion, siltation, run-off or flooding on- or off-site;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site;
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- Otherwise substantially degrade water quality;
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;
- Place within a 100-year flood hazard area structures that would impede or redirect flood flows;
- Expose people or structures to significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam; or
- Result in inundation by seiche, tsunami or mudflow.

The IS/NOP prepared for this project in July, 2009 concluded that potential impacts associated with placing housing and structures within a 100 year flood hazard area and inundation associated with seiche, tsunami, or mudflow posed no impact. Therefore, these topics will not be further addressed in this Draft EIR.

IMPACTS AND MITIGATION MEASURES

Impact 3.7-1: Violate any water quality standards or waste discharge requirements. (Less than Significant with Mitigation)

As described in the IS/NOP, the construction of the proposed project would create impermeable surfaces resulting in an increase of the amount of surface run-off and possible changes in drainage patterns on-site. The SPI site is currently designed to capture and retain all storm water generated on site within the boundaries of the SPI property. Storm water generated on site is conveyed through existing site drainage features and discharged to the existing ponds on site. No new off-site drainage facilities are proposed. The SPI facility was regulated under Waste Discharge Requirements (WDRs) Order No. R5-2004-0100. Violations recorded were not for the API specifically but for the larger SPI property. SPI was cited for exceeding discharge limits of cadmium, copper and zinc into the Sacramento River. California Water Code (CWC) Section 13385 (j)(3) requires the Discharger to prepare and implement a pollution prevention plan pursuant to Section 13263.3 of the California Water Code. A pollution prevention plan addresses only those constituents that can be effectively reduced by source control measures. Cease and Desist Order No. R5-2004-101 required SPI to implement measures to achieve full compliance with WDR Order No. R5-2004-100 by July 1, 2009. According to the CVRWQCB, SPI has not discharged any stormwater or process water to the Sacramento River since July 2009, which brings SPI into compliance with this Order. The CVRWQCB is in the process of drafting new permit conditions for the SPI site, however, it is anticipated that in order to comply with the waste discharge requirements, SPI will continue to retain all stormwater and process water onsite, as indicated by SPI staff and CVRWQCB staff.

However, in the instance of a major storm event, storm water run-off carrying waste material from the proposed cogeneration facility could potentially enter the Sacramento River and/or Spring Gulch if the onsite facilities were inundated or conveyance and/or detention capacity was exceeded.

Development and operation of the project could potentially increase local runoff production which could introduce waste material into storm waters. Best management practices (BMPs) will be applied to the proposed site development to limit / prevent waste material in any site runoff that is discharged downstream to acceptable levels.

The introduction of pollutants generated from project site runoff into surface water resources in the project vicinity is considered a **potentially significant** impact.

MITIGATION MEASURES

Mitigation Measure 3.7-1*: The project shall prepare a State approved Stormwater Pollution Prevention Plan (SWPPP) that includes specific types and sources of stormwater pollutants, determine* *the location and nature of potential impacts, and specify appropriate control measures to eliminate any potentially significant impacts on receiving water quality from stormwater runoff. The SWPPP shall require treatment Best Management Practices (BMPs) that incorporate, at a minimum, the required hydraulic sizing design criteria for volume and flow to treat projected stormwater runoff. The SWPPP shall comply with the most current standards established by the Central Valley RWQCB. BMPs shall be selected from a menu according to site requirements and shall be subject to approval by the Central Valley RWQCB. The following list is intended as an outline summary of possible BMPs to be implemented, and the County and/or the CVRWQCB may impose additional requirements:*

Non-Structural BMPs

- *Minimizing Disturbance*
- *Preserving Natural Vegetation (where possible)*
- *Good Housekeeping, e.g., daily clean-up of construction site*

Structural BMPs

Erosion Controls

- *Mulch*
- *Grass*
- *Stockpile Covers*

Sediment Controls

- *Silt Fence*
- *Inlet Protection*
- *Check Dams*
- *Stabilized Construction Entrances*
- *Sediment Traps*

Mitigation Measure 3.7-2*: The project shall obtain or perform an update of any existing NPDES permit. NPDES permits are required for discharges of pollutants to navigable waters of the United States, which includes any discharge to surface waters, including lakes, rivers, streams, bays, the ocean, dry stream beds, wetlands, and storm sewers that are tributary to any surface water body. The NPDES permits regulate discharges from publicly owned treatment works, industrial discharges, stormwater runoff, dewatering operations, and groundwater cleanup discharges. NPDES permits are issued for five years or less, and are therefore to be updated regularly.*

SIGNIFICANCE AFTER MITIGATION

Implementation of MM 3.7-1, and MM 3.7-2 would reduce stormwater runoff pollution and surface water quality impacts to a **less than significant** level by requiring the implementation of BMPs to improve storm water quality, and ensuring that the onsite storm water conveyance and detention system is adequately sized.

Impact 3.7-2: Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted). (Less than significant)

Proposed Water Use

The current total use, for both the existing SPI cogeneration plant and the sawmill, is estimated at about 400 gpm, at times of maximum water use (e.g., in the summer), of which the Cogeneration Plant (including the boiler) uses about 100 gpm on average.

As a condition of approval for the proposed project, the County will require that the existing cogeneration plant and the newly proposed cogeneration plan never operate simultaneously. The old boiler system would be used only if the new plant had a breakdown or was shut down during extended maintenance periods.

Therefore, the proposed cogeneration facility's water use will be solely that of the new tower and boiler. Midwest Towers, a manufacturer of cooling towers of the type planned, provided data on water use for the proposed tower. Water use in a cooling tower is represented by evaporation from the tower. The evaporation rate is based on the wet-bulb temperature of the air around the tower, and varies throughout the year. For the proposed tower, Lawrence and Associates supplied Midwest Tower with the average monthly wet-bulb temperatures for the project area (from the Redding Airport weather station; wet-bulb temperature is the lowest temperature that can be reached by the evaporation of water only). The wet-bulb temperature is a type of temperature measurement that reflects the physical properties of a system with a mixture of a gas and a vapor, usually air and water vapor. Wet bulb temperature is the lowest temperature that can be reached by the evaporation of water only. It is the temperature you feel when your skin is wet and is exposed to moving air. Unlike dry bulb temperature, wet bulb temperature is an indication of the amount of moisture in the air. Based on those temperatures, Midwest Towers provided a table of monthly evaporation (water demand).

Table 3.7-2 shows the data regarding maximum water use at average monthly wet-bulb temperature, and the "design" water use.

TABLE 3.7-2: AVG. MONTHLY WET-BULB TEMPERATURE, TOWER EVAPORATION, AND PREDICTED WATER USE

MONTH	WET-BULB TEMPERATURE	EVAPORATION	TOTAL WATER USE INCLUDING BOILER
	DEGREES F	GPM	GPM
January	41	323	358
February	44	337	372
March	47	347	382
April	51	363	398
May	56	383	418
June	60	399	434
July	64	416	451
August	62	406	441
September	59	393	431
October	53	373	408
November	46	343	378
December	41	323	358
Average	**52**	**367**	**402**

SOURCE: HYDROGEOLOGIC ANALYSIS, ANDERSON COGENERATION PLAN (LAWRENCE, APRIL 2010)

The design water use represents the water use at an assumed maximum wet-bulb temperature. For the new tower, the assumed maximum wet-bulb temperature is 67o F and the associated water use is 422 gpm. This is higher than the highest average wet-bulb temperature in the summer and represents the highest temperature at which the tower is designed to function properly.

It is likely that the actual average monthly water use will be less than that shown in Table 3.7-2, because the tower is unlikely to operate at 100% capacity all of the time. This is because not all of the heat that is generated at the plant goes to the cooling tower – some goes to the kilns to dry lumber. At times when the kilns need heat to dry lumber, water use in the cooling tower is less because it is not operating at full capacity.

Table 3.7-3 summarizes the old vs. new average-annual water use. Water demand at the sawmill is estimated by SPI staff to be about 300 gpm at times of maximum demand (e.g., in the summer). On an annual basis, the demand could be about half that amount.

TABLE 3.7-3: SUMMARY OF EXISTING VS. PROPOSED ANNUAL WATER USE

	EXISTING COGEN	*PROPOSED COGEN*	*SAWMILL*	*TOTAL*
	GPM	*GPM*	*GPM*	*GPM*
Current	100	0	300	400
Future	0	400	300	700
	ACRE-FEET/YEAR	*ACRE-FEET/YEAR*	*ACRE-FEET/YEAR*	*ACRE-FEET/YEAR*
Current	160	0	485	645
Future	0	645	485	1,130

SOURCE: HYDROGEOLOGIC ANALYSIS, ANDERSON COGENERATION PLAN (LAWRENCE, APRIL 2010)

The annual-average demand for the new plant alone would be about 400 gpm. This equates to about 645 acre-feet per year (400 gpm × 1,440 minutes/day × 365 days/year ÷ 325,851 gallons/acre-foot). Cumulatively, the annual demand of 700 gpm for the site as a whole (including the Sawmill) equates to about 1,130 acre-feet per year. This is an increase of 485 acre-feet per year over the current use.

For groundwater-pumping impacts evaluation, it will be assumed that the tower will operate at 100% capacity all of the time. This will lead to overestimation of the predicted impacts and a conservative impacts analysis.

Groundwater Recharge Impacts

Groundwater recharge occurs primarily through percolation of surface waters through the soil and into the groundwater basin. The addition of significant areas of impervious surfaces (such as roads, parking lots, buildings, etc) can interfere with this natural groundwater recharge process. Upon full project buildout, the proposed expansion to the SPI site will include areas of impervious surfaces, such as the proposed roadways and various structures. However, given the relatively large size of the Redding groundwater basin, the areas of impervious surfaces added as a result of project implementation will not adversely affect the recharge capabilities of the local groundwater basin. This is a **less than significant** impact.

Area Well Interference

Figure 3.7-3 shows the ½ and 1 mile radii around the Test well (a new well would be installed in this general area).

At a distance of about ½ mile, neighboring properties would experience approximately one foot of interference from SPI operations at the end of summer; at one mile the interference would be about

7 inches (Figure 3.7-2). The interference from the 450 gpm pumping rate for one month is less (about ½ foot at ½ mile and 2.5 inches at one mile).

Existing site pumping already may cause some interference on neighboring properties, at about half the magnitude of the predicted interference. Thus, the additional interference on neighboring wells, attributable to the proposed project, would be from about 3 to 6 inches. This is a **less than significant** level of interference, and no mitigation is required.

Groundwater Availability

Table 3.7-4 compares current and potential future groundwater pumping, and future project pumping, to groundwater inflow in to the Redding basin.

TABLE 3.7-4: PROJECT WATER USE

	GROUNDWATER INFLOW	*GROUNDWATER PUMPING*
	Acre-feet/year	*Acre-feet/year*
Year 1997 (assumed for current)	293,600	37,300
Year 2030	293,600	99,300
GROUNDWATER PUMPING AS % OF GROUNDWATER INFLOW		
Year 1997 (assumed for current)	13%	
Year 2030	34%	
PROJECT USE AS % OF GROUNDWATER INFLOW		
New Use (485 af/yr)	0.2%	
Total Use (1,130 af/yr)	0.4%	
PROJECT USE AS % OF OTHER GROUNDWATER USE- CURRENT		
New Use (485 af/yr)	1.3%	
Total Use (1,130 af/yr)	3.0%	
PROJECT USE AS % OF OTHER GROUNDWATER USE- YEAR 2030		
New Use (485 af/yr)	0.5%	
Total Use (1,130 af/yr)	1.1%	

SOURCE: HYDROGEOLOGIC ANALYSIS, ANDERSON COGENERATION PLAN (LAWRENCE, APRIL 2010)

Current basin pumpage is about 13% of groundwater inflow. Estimated future basin pumpage would be about 34% of groundwater inflow. The increase in pumping associated with the proposed project (485 acre-feet/year) would be about 0.2% of groundwater inflow; total facility pumping (existing plus proposed project) would be about 0.4% of groundwater inflow.

The increase in pumping associated with the proposed project would be about 1.3% of current groundwater pumping and about 0.5% of future groundwater pumping. Total facility pumping (existing plus proposed project) would be about 3% of current groundwater pumping and about 1% of future groundwater pumping.

Based on these calculations, the proposed expanded pumping, would not substantially deplete the groundwater supply.

LONG TERM YIELD

Long-term yield of the test well (Well #2a) is at least 1000 gallons per minute. Pumping for a theoretical extended period of time (180 days) at this discharge would not cause water levels to decline below the top of the screen, this well (Well #2a) could supply the expanded facility's water needs. Scenarios that assume another well will be installed to provide additional water, a minimum of two site wells will easily supply the project needs. Alternatively, one new well constructed to more modern standards could supply all project needs by itself.

The proposed expanded pumping would not substantially deplete the groundwater supply or affect long term well yields in the Redding basin. This is a l**ess than significant** impact.

Drought and Water-Supply Sustainability

As described previously in this EIR section, groundwater levels in Redding basin wells roughly correlate to precipitation – when there is less precipitation (drought), water levels decline and when there is more precipitation, water levels rise. This illustrates that the groundwater basin is in steady state, and is not overdrafted. Because the proposed pumping would not substantially deplete the groundwater supply, it will not lead to an overdraft condition in the basin.

Water level decline caused by drought is about seven feet in the vicinity of the site. Normal seasonal changes in water levels can be as much as five to seven feet. Historically, seasonal water-level changes during drought are much less than normal; during the 1987 to 1992 drought, seasonal changes were about three feet or less.

Properly constructed individual wells should be able to continue to produce water under conditions similar to historic droughts. A properly constructed well is one which is drilled deep enough into the aquifer such that anticipated water-level declines (such as droughts) can be accommodated. Assuming existing wells have continued to produce during past droughts, the addition of less than six inches of interference from new project water use should not cause neighboring wells to "go dry" during a drought. This is a **less than significant** impact.

Based on the calculations of the Lawrence and Associates' April 2010, *Hydrogeologic analysis for Expansion of Cogeneration Plant at Sierra Pacific Industries Anderson Facility* report (**Appendix E**) and the analysis presented in this EIR, the proposed expanded pumping would not substantially deplete the groundwater supply, interfere significantly with nearby wells, or cause water supply impacts during drought conditions. These findings conclude that this is a **less than significant** impact and no mitigation is required.

Impact 3.7-3: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion, siltation, run-off or flooding on- or off-site. (Less than significant with mitigation)

Implementation of the proposed project would require the construction of a limited number of on-site drainage features, BMPs to limit and prevent waste material from entering surface waters, and other minor on-site improvements designed to handle the limited increase in stormwater runoff that would occur as a result of project implementation. All of the proposed drainage improvements would occur within the interior of the SPI site. The project would not require the alteration of the course of a stream or river.

Development of the project site could potentially increase local runoff production which could introduce waste material into storm waters. As discussed under Impact 3.7-1, BMPs will be applied to the proposed site development to limit/prevent waste material in any site runoff that is discharged downstream to acceptable levels. Mitigation Measure 3.7-1 requires that the project shall prepare a State approved Stormwater Pollution Prevention Plan (SWPPP) that includes specific types and sources of stormwater pollutants, determine the location and nature of potential impacts, and specify appropriate control measures to eliminate any potentially significant impacts on receiving water quality from stormwater runoff. The SWPPP shall require treatment Best Management Practices (BMPs) that incorporate, at a minimum, the required hydraulic sizing design criteria for volume and flow to treat projected stormwater runoff. The SWPPP shall comply with the most current standards established by the Central Valley RWQCB. BMPs shall be selected from a menu according to site requirements and shall be subject to approval by the Central Valley RWQCB. A list of possible BMPs that may be incorporated are listed under Mitigation Measure 3.7-1.

All of the additional stormwater runoff generated as a result of project implementation would be treated with BMPs and channeled to the existing onsite log ponds, where it will be detained. Detained water in the existing log ponds either percolates into the groundwater basin or is re-applied to the site through daily water for fire suppression. Implementation of the proposed project would not result in an increased volume of stormwater leaving the SPI property. The project would not result in additional demand for stormwater conveyance through infrastructure in the vicinity of the site, which is owned and maintained by Shasta County and the City of Anderson respectively.

While the project would alter the existing drainage pattern of the project site, all run-off would be conveyed and detained within the project site. The project would have a **less than significant** impact on on-site or off-site flooding. As described under Impact 3.7-1 above, the introduction of pollutants generated from project site runoff into surface water resources in the project vicinity is considered a **potentially significant** impact.

MITIGATION MEASURES

See Mitigation Measure: 3.7-1 & 3.7-2

SIGNIFICANCE AFTER MITIGATION

Implementation of MM 3.7-1, and MM 3.7-2 would reduce potential stormwater runoff pollution and surface water quality impacts to a **less than significant** level.

Impact 3.7-4: Substantially alter the existing drainage pattern of the site or area, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site. (Less than Significant)

The construction of the proposed cogeneration facility would create impermeable surfaces resulting in an increase of the amount of surface run-off and possible changes in drainage patterns on-site. Storm water run-off carrying waste material from the proposed cogeneration facility could potentially enter the Sacramento River and/or Spring Gulch.

As described above, the project would result in a relatively small increase in the amount of impervious surfaces on the project site. These new impervious surfaces include the proposed buildings and facilities required for the cogeneration plant. As described above, all runoff generated on the project site would be conveyed to the existing on-site log ponds after it has been treated by BMPS, which are required by MMs 3.7-1 and 3.7-2. The log ponds have adequate capacity to receive the additional runoff that would be generated by the proposed project.

The addition of the new impervious surfaces to the project site would not result in an appreciable increase in stormwater runoff as a result of project implementation. All of the additional stormwater runoff generated by the proposed project would be detained on-site, and discharges from the project site would not exceed pre-project levels. The project site is already equipped with a series of drainage ditches that convey applied surface waters (log spraying, etc.) to the existing on-site log ponds. Implementation of the proposed project would not result in impacts associated with on- or off-site flooding. This is considered a **less than significant impact**, and no mitigation is required.

Impact 3.7-5: Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. (Less than significant with mitigation)

As described above, all of the additional stormwater runoff generated as a result of project implementation would be treated with BMPs and channeled to the existing onsite log ponds, where it will be detained. Implementation of the proposed project would not result in an increased volume of stormwater leaving the SPI property during a normal storm event. The project would not result in additional demand for stormwater conveyance through infrastructure in the vicinity of the site, which is owned and maintained by Shasta County and the City of Anderson respectively.

Development of the project site could potentially introduce additional sources of pollutants into storm waters during a storm event, if the storm event produced precipitation levels great enough to exceed the storage capacity of the existing log ponds. BMPs will be applied to the proposed site development to limit / prevent waste material in any site runoff that is discharged downstream to acceptable levels.

The introduction of pollutants generated from project site runoff into surface water resources in the project vicinity is considered a **potentially significant** impact.

MITIGATION MEASURES

See Mitigation Measure: 3.7-1 and 3.7-2

SIGNIFICANCE AFTER MITIGATION

Implementation of MM 3.7-1, and MM 3.7-2 would reduce stormwater runoff pollution and surface water quality impacts to a **less than significant** level.

Impact 3.7-6: Project implementation could expose people or structures to significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam. (Less than Significant)

The project site is not located within the inundation risk area for Whiskeytown Dam. The project site and all of the City of Anderson as well as much of the northern portion of the Sacramento Valley are in the inundation risk area in the event of the failure of Shasta Dam.

The safety of dams in California is stringently monitored by the California Department of Water Resources, Division of Safety of Dams. In the unlikely event of a dam failure, there is the potential that the project site could become inundated with water. However, there are no residences proposed as part of the project, so the project would not place residential structures or residential occupants at risk of dam failure. Employees of the project site would have to be evacuated in the event of dam failure. The County Office of Emergency Services maintains the Shasta County Emergency Plan which sets for the County's methods for warning its occupants of a dam failure or other emergency and also establishes evacuation routes in the unlikely event of a dam failure. Implementation of the proposed project would not increase the risk of exposure to dam failure, place new residences within a dam failure inundation zone, nor would it expose people to significant risk of dam failure. This is a **less than significant** impact and no mitigation is required.

- 500-yr Flood
- A - 100-yr Flood, No BFEs
- AE - 100-yr Flood, BFEs determined
- Area of Proposed Improvements (API)
- SPI Project Site Boundary

Figure 3.7-1. Flood Zone Map

N
W E
S

0 250 500 1,000 1,500 Feet

1:7,500

Flood zone source: FEMA Map Service Center Flood Map Store, January 4, 2010.
Road Data Source: ESRI StreetMap North America
Aerial Photo Source: ArcGIS Online Resource Center
Parcel Data Source: Shasta County GIS

De Novo Planning Group

A Land Use Planning, Design, and Environmental Firm

May 10, 2010

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Interference vs. Distance for One Well Pumping
430 gpm for 180 Days & 450 gpm for 30 Days
Hydraulic Conductivity (K) of 140 feet/day

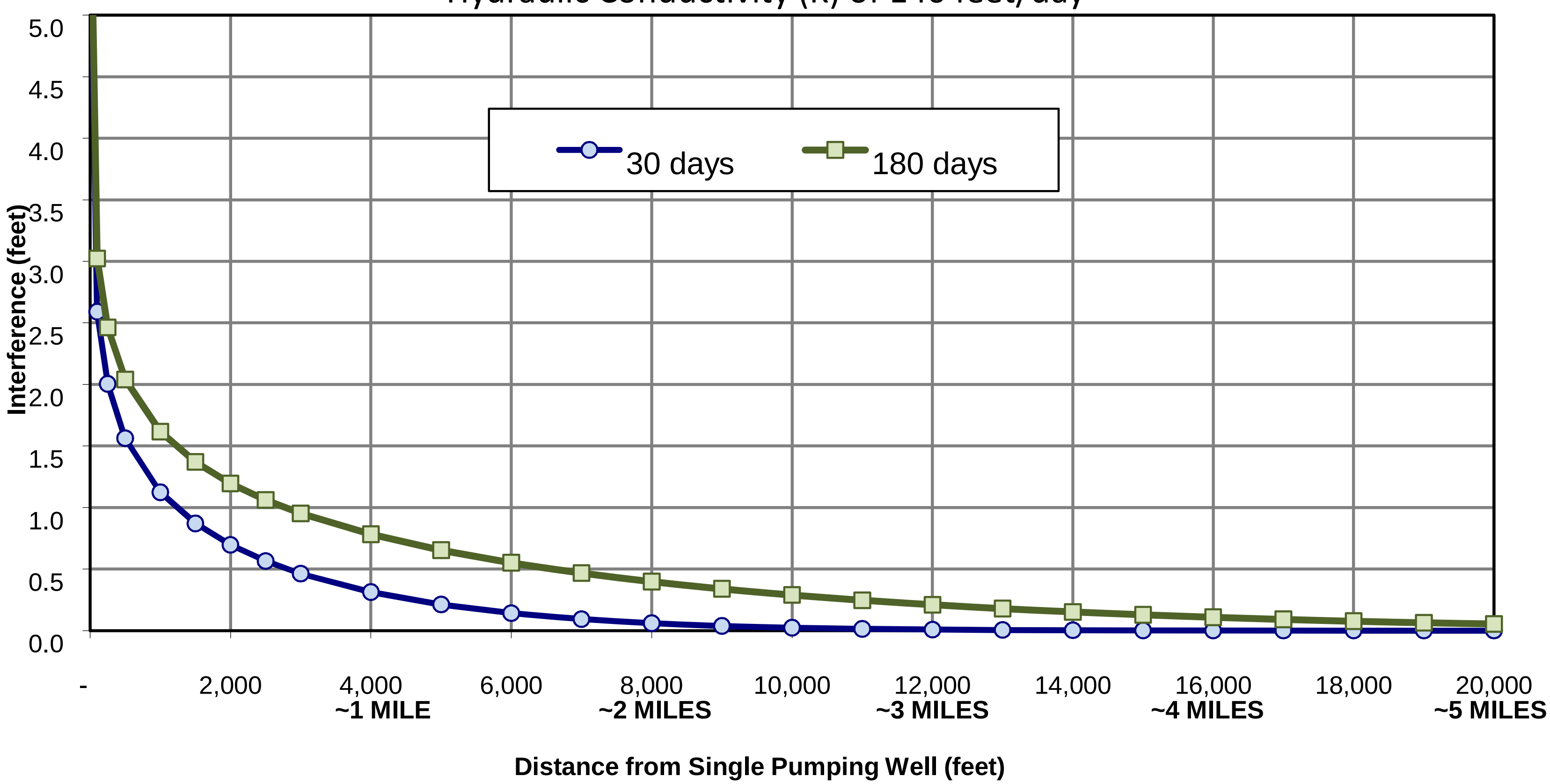

FIGURE 3.7-2

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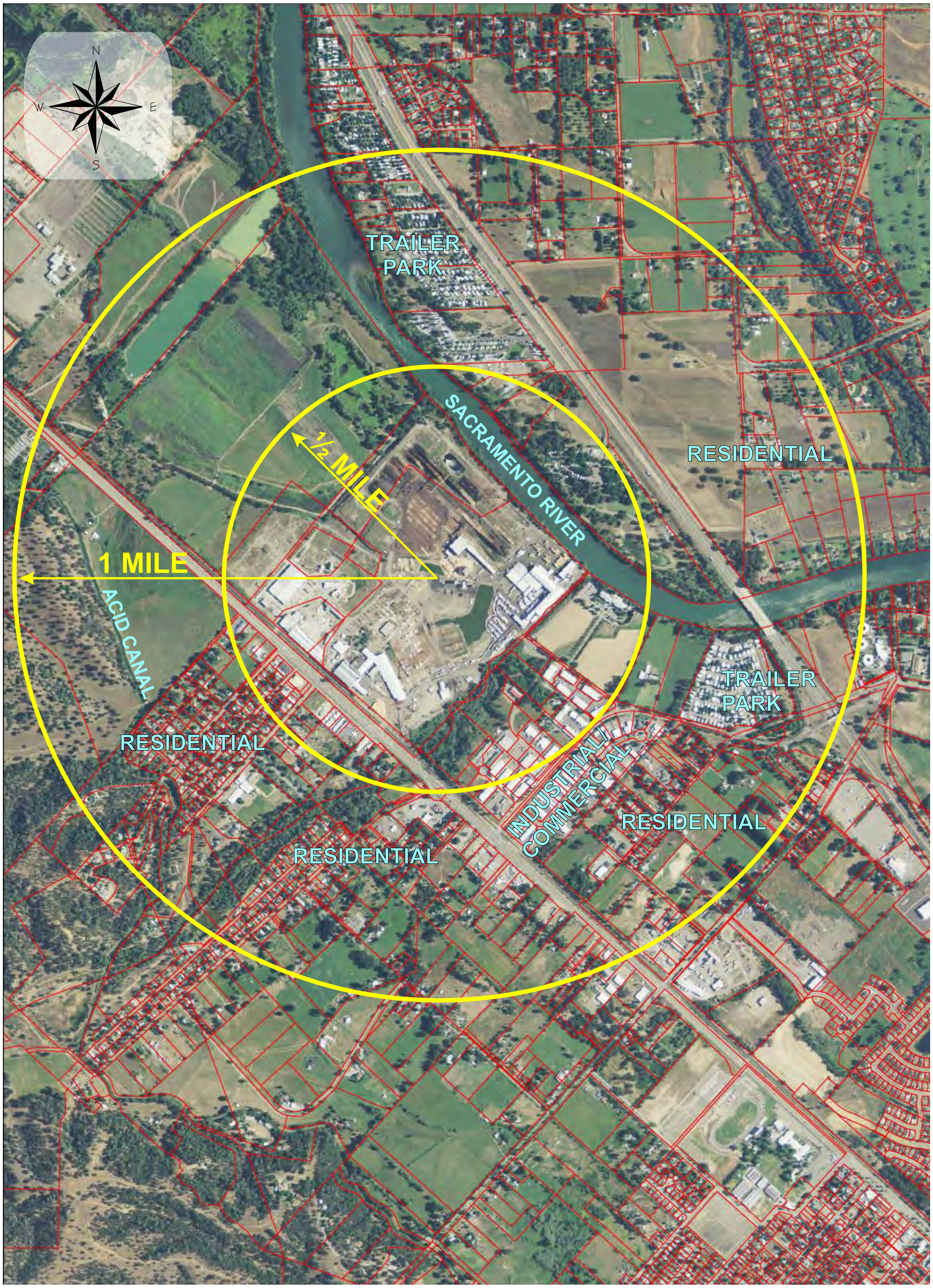

VICINITY MAP SIERRA PACIFIC INDUSTRIES, ANDERSON, CA MAP ADAPTED FROM SHASTA CO. 2004 AERIAL IMAGERY		LAWRENCE & ASSOCIATES 2001 Market Street, Room 523 Redding, CA 96001 Phone (530) 244-9703 Fax (530) 244-5021	SCALE: 2.5 INCHES = 1 MILE DATE: APRIL 7, 2010 JOB NO.: 007134.00
CLIENT: SIERRA PACIFIC INDUSTRIES	PROJECT: HYDROGEOL. ANALYSIS	DRAWN BY: B. LAMPLEY	FIGURE 3.7-3

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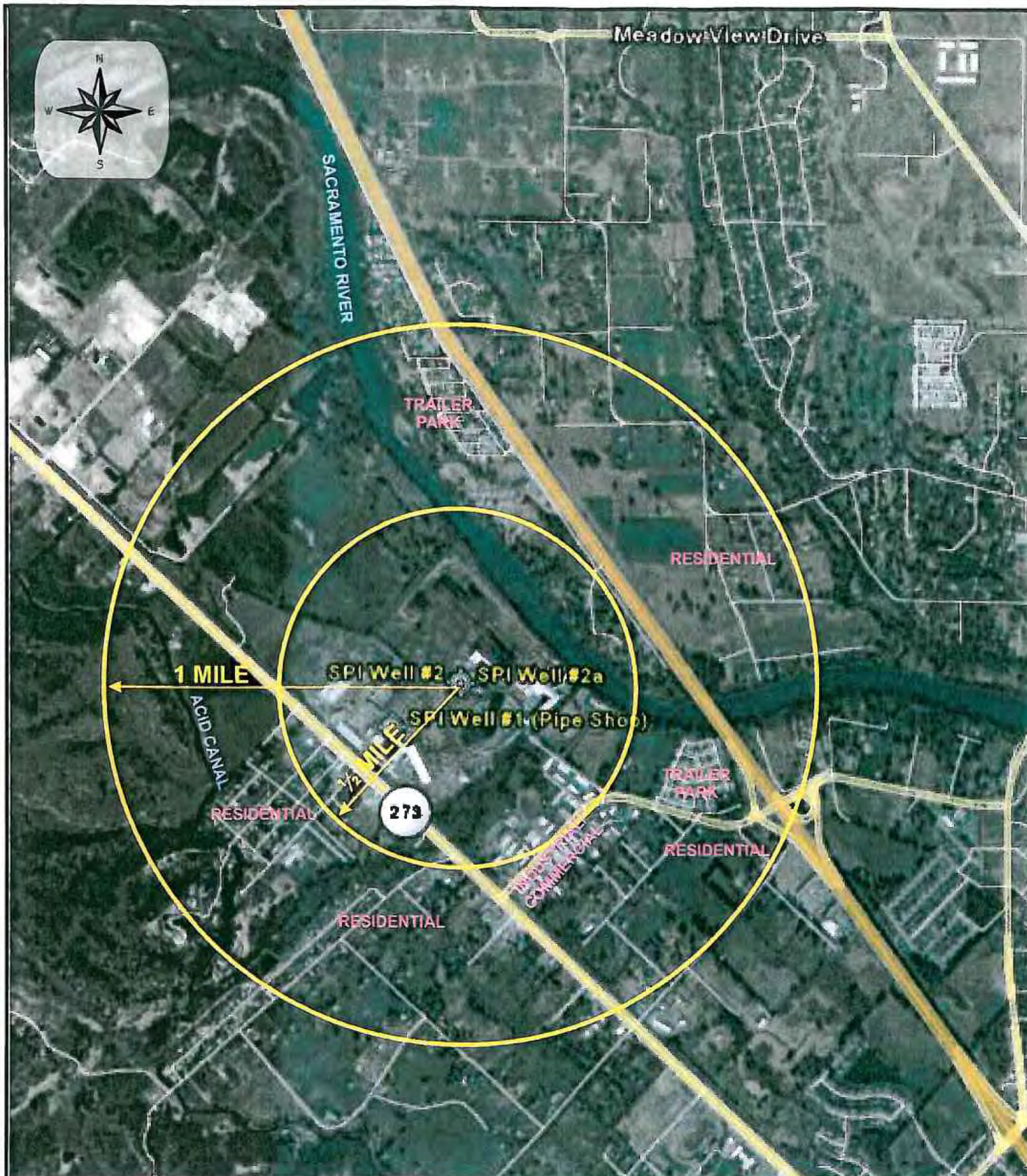

VICINITY MAP SIERRA PACIFIC INDUSTRIES, ANDERSON, CA MAP ADAPTED FROM GOOGLE EARTH IMAGERY		LAWRENCE & ASSOCIATES 2001 Market Street, Room 523 Redding, CA 96001 Phone (530) 244-9703 Fax (530) 244-5021	SCALE: 2.5 INCHES = 1 MILE DATE: DEC. 10, 2007 JOB NO.: 007134.00
CLIENT: SIERRA PACIFIC INDUSTRIES	PROJECT: HYDROGEOL. ANALYSIS	DRAWN BY: C. KLINESTEKER	Figure 3.7-4

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