

6.14 Air Quality

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This section describes the climate and air quality conditions in the vicinity of the Upper North Fork Feather River Hydroelectric Project (UNFFR Project) and analyzes the potential effects of the operation of the UNFFR Project under a new Federal Energy Regulatory Commission (FERC) license on air quality and odors.

6.14.1 Environmental Setting

Climate and Topography

Plumas County is in northeastern California where the Sierra Nevada and Cascade Range meet. The county's four-season climate attracts visitors and residents to the area. It also provides good conditions for hydropower production. Temperatures range from an average low in January of 18°F in Portola to an average high in July of 91°F in Quincy (Plumas County Fire Safe Council 2005). Annual precipitation ranges from 82 inches in Strawberry on the west side of the county to 22 inches in Portola on the east side of the county. The major canyons in the county, including the North Fork Feather River canyon, affect wind patterns and create localized variations in climate and air quality. The wide range of elevations—1,600 feet to more than 10,000 feet at Mt. Lassen—also influences variations in climate across Plumas County.

Within the UNFFR Project boundary, the difference in elevation of Lake Almanor and Belden powerhouse is more than 2,000 feet, which results in climate variations between the upper and lower facilities. Lake Almanor is at an elevation of 4,500 feet above sea level and is in a very broad basin with surrounding peaks extending 6,000 to 7,000 feet high (Federal Energy Regulatory Commission 2005). Butt Valley reservoir is below Lake Almanor at an elevation of 4,000 feet and occurs in a small basin with surrounding ridges about 5,500 feet high. The steepest drop in elevation occurs from Canyon dam at an elevation of 4,400 feet to the Caribou powerhouses below Butt Valley dam at 2,985 feet. From the Caribou powerhouses to the confluence with the East Branch of the North Fork Feather River, the elevation drops to 2,290 feet. At an elevation of 2,215 feet, the Belden powerhouse is the lowest point of the UNFFR Project. The slopes of the North Fork Feather River canyon are very steep between Canyon dam and Belden powerhouse.

At Lake Almanor, precipitation occurs primarily during the winter months, with substantial snow accumulation (Federal Energy Regulatory Commission 2005). Normal annual precipitation at Lake Almanor and at Butt Valley reservoir is approximately 38 inches, and summer months are typically dry and mild with occasional summer thunderstorms. Average monthly temperatures in Chester near the shore of Lake Almanor range from lows of 31°F in January to highs of 67°F in July (Northern Sierra Air Quality Management District 2005). Because the Caribou and Belden powerhouses are at lower elevations than the reservoirs, seasonal temperatures tend to be higher at the powerhouses. Annual average precipitation at the Caribou powerhouses and Belden powerhouse is 41 inches, and snow accumulation is typically rare.

Regional Air Quality

Plumas County is in the Mountain Counties Air Basin, and air quality is regulated by the Northern Sierra Air Quality Management District (AQMD). The county has generally good air quality, but air pollutants from the Sacramento region, and to a lesser extent the San Francisco Bay Area, are occasionally transported into Plumas County during strong northerly winds.

Wildfires also create a source of smoke and poor air quality, primarily during the summer months.

The State established California ambient air quality standards (CAAQS) for 10 criteria pollutants, and the California Air Resources Board (CARB) is tasked with assigning area designations based on available air quality data and the CAAQS (see Chapter 5 for description of standards). The CAAQS are more stringent than the national ambient air quality standards (NAAQS) established by the United States Environmental Protection Agency (USEPA). USEPA classifies areas as attainment, nonattainment, or unclassified based on the NAAQS. Plumas County is classified as nonattainment for respirable particulate matter (PM₁₀) under the CAAQS and is in attainment or unclassified for other CAAQS and all NAAQS. The nonattainment status is likely a result of periodic smoke from wildfires, dust, and pollutant accumulation from the Sacramento region.

Ambient Air Quality

The Northern Sierra AQMD and CARB monitor air quality in Plumas County at three monitoring stations. The Chester monitoring station at 222 1st Avenue is closest to the UNFFR Project (northwest shore of Lake Almanor), and the Quincy monitoring station on North Church Street is about 15 miles southeast of the UNFFR Project. The Chester station collects data on PM_{2.5}. The Quincy station collects data on PM_{2.5} and weather. The Quincy station formerly monitored ozone and PM₁₀ (replaced by PM_{2.5} monitoring). Data collected at these stations during the month of August 2009 indicate generally good air quality, with occasional violations of the federal 24-hour standard for PM_{2.5} in Quincy (California Air Resources Board 2009). Chester air quality remained under the 24-hour standard throughout the month. Annual and monthly averages were not available for recent years; however, based on the air quality monitoring data for the first part of 2009, exceedances of the CAAQS for PM₁₀ likely occurred periodically throughout the year.

Particulate matter is the primary pollutant of concern in Plumas County and in the vicinity of the UNFFR Project, especially in areas of concentrated development around Lake Almanor and, to a lesser degree, Butt Valley reservoir. Particulate matter consists of fine mineral, metal, soot, smoke, and dust particles suspended in the air. For health reasons, particulate matter that is less than 10 microns in diameter (PM₁₀) is monitored throughout the state. Primary contributors to PM₁₀ include wood stoves, wind-blown dust from dirt roads and agriculture, open burning from backyard burn piles, and prescribed burning. Wildland fires and construction activities also result in short-term increased levels of particulate matter. The electrical facilities associated with the UNFFR Project create a risk for wildfires, and several small fires and at least one large fire have been reported in the area by PG&E, although the ignition source may not have been from the UNFFR Project facilities (Federal Energy Regulatory Commission 2005). Diesel emissions from construction equipment and dust from ground disturbance also affect air quality. Some of these sources contribute to increases in local PM₁₀ concentrations, while others, such as vehicle traffic and periodic wildland fires, affect regional concentrations.

Odors

During the fall months, the water released from Canyon dam into the Seneca reach has carried hydrogen sulfide odors, which are occasionally noticeable from State Route (SR) 89 (Federal Energy Regulatory Commission 2005). Odors are most noticeable during normal and wet water

years when the Canyon dam outlet¹ draws water from the hypolimnion (lower level) of Lake Almanor. The odors are a result of sulfates at the water/sediment level of the lake being reduced to sulfides under low dissolved oxygen concentrations and the release of hydrogen sulfide into the air as the water is released below the dam. Water drawn from the metalimnion (middle layer) of the lake during below normal water levels tends to be lower in sulfides and has a less noticeable odor. This topic is discussed in detail in Section 6.5, Water Quality.

Sensitive Receptors

Plumas County is a rural mountain county with a few urban areas along the major highways. Rural residences are scattered throughout the county. Near the UNFFR Project facilities, development is primarily limited to Chester, Prattville, Greenville, and other communities along SR 70, SR 89, and SR 36 and around Lake Almanor. Recreational uses are the dominant public use along the North Fork Feather River and at Lake Almanor and Butt Valley reservoir. Sensitive uses around the UNFFR Project facilities that could be affected by air quality are predominantly recreation-based, with scattered residential uses. The residential and recreation receptors may include children, the elderly, and other health-sensitive people, who have higher sensitivity to air pollution.

The primary sensitive receptors in the vicinity of the activity areas at Lake Almanor include recreationists at the campground, boat launch, and viewing areas near Canyon dam; recreationists at day use areas, boat launches, and other recreation sites near the Prattville intake; recreationists (boaters and fishermen) on the water at Lake Almanor near Canyon dam and the Prattville intake; residents and workers at the PG&E camp downstream of Canyon dam; residents in the communities near the Prattville intake; and various wildlife. The Prattville community is approximately 0.3 mile southeast of the Prattville intake, and the Almanor community is approximately 0.5 mile northeast of the Prattville intake. The Canyon dam community is approximately 0.8 mile east of Canyon dam. The primary sensitive receptors in the vicinity of the Caribou intakes activity area at Butt Valley reservoir include campers, boaters (fishing and sailing), other recreationists on the east shore, and wildlife. No residential uses occur in the vicinity of Butt Valley dam.

6.14.2 Environmental Impacts and Mitigation Measures

Methodology

The air quality impact analysis is based on air quality information for Plumas County and a qualitative discussion of increased emissions associated with the Proposed UNFFR Project, Alternative 1, and Alternative 2. Key sources used to define the environmental setting include the Northern Sierra AQMD website (<http://www.myairdistrict.com/>), Plumas County website (<http://www.countyofplumas.com/>), and relevant technical reports. Increased emissions from construction activities and traffic were qualitatively analyzed in terms of their potential to contribute to air quality violations in the area or to exceed air quality standards.

Thresholds of Significance

Impacts on air quality would be significant if the Proposed UNFFR Project, Alternative 1, or Alternative 2 would:

¹ Canyon dam "intake" and Canyon dam "outlet" are synonymous.

- violate ambient air quality standards or contribute substantially to an existing or projected air quality violation;
- result in a cumulatively considerable net increase of any criteria pollutant (e.g., PM₁₀) for which the region is in non-attainment;
- expose sensitive receptors to substantial pollutant concentrations; or
- create objectionable odors that would affect a substantial number of people.

Impacts and Mitigation Measures

This section discusses the anticipated impacts of the Proposed UNFFR Project and each alternative on air quality and identifies mitigation measures for significant impacts. Table 6.14-1 compares the final level of significance for each impact (with incorporation of mitigation measures if appropriate).

Table 6.14-1. Summary of Air Quality (AQ) Impacts

IMPACT	PROPOSED UNFFR PROJECT	ALTERNATIVE 1	ALTERNATIVE 2
Impact AQ-1: Construction activities associated with the UNFFR Project would generate fugitive dust and contribute to local violations of particulate matter standards.	Less than significant with mitigation	Less than significant with mitigation	Less than significant with mitigation
Impact AQ-2: Construction traffic associated with the UNFFR Project would contribute to air pollution along access routes.	Less than significant	Less than significant	Less than significant
Impact AQ-3: The UNFFR Project could generate odors that would affect sensitive receptors at Lake Almanor and along the North Fork Feather River.	No impact	Less than significant	No impact

Impact AQ-1: Construction activities associated with the UNFFR Project would generate fugitive dust and contribute to local violations of particulate matter standards.

Proposed UNFFR Project and Alternatives 1 and 2

Construction activities would involve truck and equipment traffic on unpaved surfaces and ground disturbance along the shore of Lake Almanor, which would generate fugitive dust. Equipment and truck exhaust would emit particulate matter, nitrogen oxides, reactive organic gasses, and other pollutants. Diesel particulate matter is a toxic air contaminant (TAC), and exposure to TACs can result in adverse health effects, particularly for people sensitive to air quality impacts. Under Alternatives 1 and 2, fugitive dust and pollutant emissions from construction activities at Prattville intake could create unhealthy conditions within and adjacent to this activity area and for residents to the south of the area. Under Alternative 1, pollutant emissions from construction activities at Canyon dam could create unhealthy conditions for

travelers along SR 89, residents and workers at the PG&E camp to the south, and recreationists at the nearby day use area, campground, and on the lake.

Under both Alternatives 1 and 2, construction activities at Butt Valley reservoir would result in fugitive dust and particulate matter emissions similar to those described for the Lake Almanor area; however, air quality impacts at Butt Valley reservoir would affect fewer sensitive receptors, because no residences occur in the vicinity of Butt Valley dam, and recreational use is focused on the eastern shore of the reservoir.

Although construction emissions would be temporary and primarily localized around the activity areas, the increase in particulate matter would contribute to the existing violations of particulate matter in the county and could exceed national or state ambient air quality standards. Operation of construction equipment will be required to comply with the Northern Sierra AQMD air quality rules and applicable permits, and PG&E would be required to minimize fugitive dust and emissions. However, construction impacts on air quality would be **significant without mitigation** because of the proximity of sensitive receptors and the existing nonattainment status of Plumas County for particulate matter.

Mitigation Measure

Mitigation Measure AQ-1: Implement a Fugitive Dust and Emission Control Plan

Construction projects could result in temporary air quality effects. During ground disturbing construction projects, PG&E shall implement the following requirements:

- Construction access roads and the construction site will be sufficiently watered to prevent excessive amounts of dust.
- Pursuant to the California Vehicle Code (Section 23114), cover or maintain adequate freeboard on all trucks hauling soil or other loose material to and from the activity area to ensure retention of materials within the truck bed (e.g., ensure 1 to 2 feet vertical distance between top of load and the trailer).
- Suspend all ground-disturbing activities with the potential to generate dust when winds exceed 20 miles per hour.
- Designate a qualified person to monitor dust control and order increased watering as necessary to prevent transport of dust offsite. This person would also respond to any citizen complaints. In the event that conditions become unfavorable, the monitor would have the authority to modify or slow down operation until conditions are acceptable again.
- After construction is complete, the construction site(s) will be seeded with native grasses or plants consistent with USFS or land owner requirements.
- Equipment engines will be maintained in good condition with proper tuning as set forth in manufacturers' specifications.

Significance after Mitigation

This mitigation measure falls outside the purview of the State Water Board. However, PG&E has agreed to implement Mitigation Measure AQ-1, as proposed, in an email dated

March 3, 2014 (Appendix H). Implementation of Mitigation Measure AQ-1 would reduce fugitive dust and particulate matter emissions to a **less than significant** level.

Impact AQ-2: Construction traffic associated with the UNFFR Project would contribute to air pollution along access routes.

Proposed UNFFR Project and Alternatives 1 and 2

Construction traffic accessing the UNFFR Project areas would use SR 70, SR 89, and local roads in the vicinity of Lake Almanor and Butt Valley reservoir. Truck and worker vehicle emissions would contribute to existing motor vehicle emissions in the region. However, construction traffic emissions would be temporary and would not result in a substantial increase in air pollutants based on the anticipated number of workers and the equipment expected to be used. Plumas County is currently in nonattainment status for particulate matter and is in attainment or unclassified for other pollutants. Construction-related impacts associated with particulate matter are discussed under Impact AQ-1. Traffic-related impacts on other pollutants during the construction period would be **less than significant** and would not result in violations of national or state ambient air quality standards.

Impact AQ-3: The UNFFR Project could generate odors that affect sensitive receptors at Lake Almanor and along the North Fork Feather River.

Proposed UNFFR Project

No increase in odors are anticipated under the Proposed UNFFR Project. The activities associated with the Proposed UNFFR Project are not expected to generate odor around Lake Almanor or increase odors in water released downstream. Odors are not currently a concern. The Proposed UNFFR Project will have **no impact** on odors.

Alternative 1

Modifications to the Canyon dam outlet structure would result in a substantial increase in the quantity of cool water pulled from the hypolimnion of Lake Almanor and released into the North Fork Feather River between May and September. The release of hypolimnion water could result in hydrogen sulfide odors similar to those that are currently noticeable along SR 89 during the fall, but the increased quantity of water is expected to dilute the odors. These odors may be noticeable to recreational users in the immediate vicinity of the North Fork Feather River just below Canyon dam, but they would not affect a large area or a substantial number of people. Odors resulting from the increase in Canyon dam releases would have a **less than significant** impact.

Odor impacts are not anticipated as a result of the Prattville intake thermal curtain at Lake Almanor or the Caribou intakes thermal curtain at Butt Valley reservoir.

Alternative 2

No odor impacts are anticipated under Alternative 2. The thermal curtains at Prattville intake and Butt Valley reservoir are not expected to generate odor or increase odors in water released downstream. Odors are not currently a concern at these locations. Alternative 2 will have **no impact** on odors.