

8.0 ENVIRONMENTAL SETTING

The environmental setting of a proposed project establishes the baseline condition against which potential environmental impacts of the proposed project are compared. The proposed project is a water quality protection program, designed to address existing or potential impacts to water quality within the Region with the goal of improving water quality for the protection of human health, recreation, aquatic life, and ecosystem function. As a programmatic analysis, this section provides a general description of the Region, highlighting the key factors identified in the CEQA analysis including: aesthetics, agricultural resources, air quality, biological resources, cultural resources, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation/traffic, and utilities and service systems.

The North Coast Region comprises all basins including Lower Klamath Lake and Lost River Basins draining generally westward into the Pacific Ocean from the California-Oregon state line southerly to the southerly boundary of the watershed of the Estero de San Antonio and Stemple Creek in Marin and Sonoma Counties⁶. The Region is divided into two natural drainage basins: 1) the Klamath River sub-basin which drains the Cascade Range Geomorphic Province, the Modoc Plateau Geomorphic Province and the Klamath Mountain Geomorphic Province and 2) the North Coastal sub-basin which drains the Coast Range Geomorphic Province. The North Coast Region covers all of Del Norte, Humboldt, Trinity, and Mendocino Counties, major portions of Siskiyou and Sonoma Counties, and small portions of Shasta, Glenn, Lake, and Marin Counties.

The North Coast Region comprises a total area of approximately 19,390 square miles (mi²), including 340 miles of scenic coastline, 362 miles of designated Wild and Scenic Rivers, 416 mi² of National Recreation Areas, and 1,627 mi² of National Wilderness Areas, as well as urbanized and agricultural areas. The Region is characterized by steep, mountainous forested terrain with distinct temperature and precipitation zones. The mountain crests, which form the eastern boundary of the region, are about 6,000 feet elevation with a few peaks higher than 8,000 feet. Much of the region is mountainous and rugged; only 13 percent of the land is classified as valley or mesa, and more than half of that is in the higher- elevation northeastern part of the region in the upper Klamath River Basin. The coast is mild, foggy and produces moderate variations in seasonal temperatures. Coastal redwoods and Douglas fir-tanoak forests dominate this landscape. Inland areas outside of the coastal influence undergo more extreme seasonal temperature variation with seasonal maximums exceeding 100 °F. Oaks and pines interspersed with grasslands and chaparral are more common inland.

⁶ CWC § 13200(a)

In 1998, the U.S. Geological Survey (USGS) published a report entitled “The Status and Trends of the Nation’s Biological Resources.” What follows are excerpts from this report for northwestern California⁷.

“Northwestern California has the wettest, most consistent climate in the state. It is composed mainly of the coastline and several metamorphic mountain ranges, including the Klamath Mountains and the north Coast Ranges. The coastal region, from the Oregon border south to Bodega Bay, is dominated by areas of coastal prairie, some coastal marsh, closed-cone pine and cypress forests on poor soils, and grand fir–Sitka spruce forests on better soils (Hickman 1993). Many of the cypress groves are associated with chaparral, rock outcrops, or serpentine soils. The closed-cone pines are generally small in stature and, like the cypresses, are associated with chaparral, fire, and shallow, acidic, nutrient-poor soils, often serpentine or sandstone. These pines are short-lived (50–100 years), and their seeds can only germinate on bare mineral soils. Like the cypresses, the closed-cone pines require fire for successful reproduction. Knobcone pine is the most widespread of the closed-cone pines, ranging nearly the length of the state.”

“The Klamath Mountains are geologically old and support mixed evergreen forests of Douglas-fir, ponderosa pine, and sugar pine, with mountain hemlock, white fir, and chinquapin found at higher elevations. Serpentine soils are common in the Klamath Mountains. On the west side, Douglas-fir–hardwood forests grow at low elevations, giving way at higher elevation to white fir–Douglas-fir forests, white fir–California red fir forests, and finally to mountain hemlock–California red fir at the highest elevations. East and south of the highest ridges, the climate is drier and more continental. At low elevations, forests are dominated by ponderosa pine, which is replaced by white fir–pine forests at higher elevations, then red fir–white fir forests, and finally mountain hemlock–red fir, with whitebark pine occurring at the highest elevations. The Klamath Mountains have a high floristic diversity, in part because they have acted as refugia supporting many endemics and relict species, including Pacific silver fir, subalpine fir, Alaska-cedar, Brewer spruce, Engelmann spruce, and foxtail pine. The complex vegetation patterns in the Klamath Mountains seem based primarily on differences in soils and secondarily on elevation and soil moisture (Sawyer and Thornburgh 1977).”

“The northern Coast Ranges occur immediately south of the Klamath Mountains. Coast Range forests do not include hemlock and have

⁷ <http://www.nwrc.usgs.gov/sandt/SNT.pdf> accessed August 16, 2013.

noble or red fir replacing grand fir, with rhododendron replacing chinquapin in the understory. Hardwoods increase in frequency on the drier slopes inland. The outer northern Coast Ranges, those farthest to the west, receive a great deal of rain (Hickman 1993). Riparian areas and north-facing slopes of the Coast Range fog belt support redwood forests..., which thrive where coastal fog is frequent. Redwood is a California endemic and is the tallest (112 meters) and fastest-growing tree in the world (Zinke 1977); one of these trees may live more than 2,000 years (Bakker 1972). Although redwoods were common in the Tertiary over much of North America, they are now restricted to the fog belt of maritime central and northern California. Proximity to the sea moderates temperatures, and fog helps prevent evapotranspiration (moisture loss from leaves). Fog drip contributes considerable moisture to the soil during the otherwise dry summer season (18–30 centimeters per year; Zinke 1977). The continuous moisture enables redwood forests to be home to a number of amphibians, including ensatinas, ocelot-spotted giant salamanders, tailed frogs, and seep salamanders, as well as the more common banana slugs (Bakker 1972).”

“Douglas-fir is often a codominant in redwood forests, becoming established after fires, and tanoak, California bay, madrone, and western hemlock are common understory trees where enough light penetrates the canopy (Zinke 1977). Redwood is a valuable timber tree because of its size and because of the wood’s unique resistance to rot. More than 85% of the oldgrowth coast redwood forests has been logged, but much of the original distribution of about 810,000 hectares remains in second-growth redwood forests of varying ages. Second-growth redwood forests support most of the same native vascular plants as old-growth forests, but habitat for species that depend on old-growth forests—such as spotted owls, marbled murrelets, some arthropods, mollusks, and canopy lichens—has been greatly reduced (U.S. Fish and Wildlife Service 1995a). Logging of redwood continues, although most old-growth stands are now protected in state parks and in Redwood National Park.”

“Drier slopes of the Coast Ranges support mixed-evergreen and mixed-hardwood forests, whereas montane forests of subalpine fir and pines are found at higher elevations. Vegetation on the highest peaks is similar to that found at high elevations in the Sierra Nevada; peaks above 1,500 meters are treeless and experience heavy winter snows. Summers are hot and rainfall is low in the inner northern Coast Ranges, especially on eastern slopes in the rain shadow of the peaks. Serpentine soils are common, and dry eastern slopes support chaparral and pine–oak woodland. (Hickman 1993).”

8.1 Aesthetics

The North Coast Region is a predominantly rural region with numerous outstanding natural features and scenic vistas, including dramatic coastline, rolling hills, mountains, forests, rivers, wetlands, and estuaries. Hundreds of miles of highway cross through the North Coast Region. But, only a total of 52 miles have been designated officially as State Scenic Highway. This includes 12 miles of Highway 101 as it passes through Redwood State Park in Del Norte County; 12 miles of Highway 12 east of Santa Rosa in Sonoma County, and 28 miles of Highway 116 west of Santa Rosa in Sonoma County. Much of the rest of the highway system in the region is eligible as State Scenic Highway but has not been designated. These are listed in Table 8.1.

Table 8.1. Highways eligible but not designated as State Scenic Highways⁸

County	Highways
Del Norte	101 north of Crescent City, 169, 197, and 199
Glenn	None
Lake	20, 29, and 281
Mendocino	1, 20 and 101
Modoc	139 and 299
Siskiyou	96
Sonoma	1 and portions of 12
Trinity	2 and 299

As a general matter, light pollution resulting from outdoor lighting is restricted to the urban areas around Humboldt Bay from McKinleyville to Fortuna, Fort Bragg, Willits, Ukiah, and the greater Santa Rosa area from Windsor to Cotati. Light pollution may be locally present wherever there are multiple outdoor lights.

8.2 Agriculture

The predominant land uses in the North Coast Region are in the agricultural sector, including farming, ranching and timber production.

The California State Department of Conservation (Conservation) produces maps of counties with Prime Farmland, Unique Farmland, and Farmland of Statewide Importance (agricultural lands of special significance). These are farmlands which based on their soil characteristics are especially well suited for agricultural production. Conservation has produced maps for Modoc, Siskiyou, Mendocino, and Sonoma counties. These maps indicate agricultural lands of special significance predominantly concentrated in: 1) the Tule Lake region in Modoc County; 2) the Scott Valley, Shasta Valley, and upper Klamath River Valley in Siskiyou County; 3) Round Valley, Potter Valley, Eden Valley, Anderson Valley and the upper Russian

⁸ http://www.dot.ca.gov/hq/LandArch/scenic_highways/, accessed 8/16/13.

River Valley in Mendocino County; and 4) Alexander Valley, Dry Creek Valley, and the Laguna de Santa Rosa in Sonoma County.

Conservation also defines areas of grazing land, based on certain environmental characteristics. Mendocino County is identified as predominantly grazing land. Sonoma County is a patchwork of farm land and grazing land. Modoc and Siskiyou counties are predominantly National Forest, interspersed with farmland and grazing land.

The U.S. Forest Service (USFS) manages lands encompassing approximately 56% of the North Coast Region (6,889,419 acres) spread between two USFS Regions and six national forests:

1. USFS Region 5 (Pacific Southwest Region), manages all of or a portion of the following National Forests: Modoc National Forest, Klamath National Forest, Shasta/Trinity National Forest, Six Rivers National Forest, and Mendocino National Forest. These Forests comprise about 6,793,819 acres of the North Coast Region.
2. USFS Region 6 (Pacific Northwest Region) manages a portion of the Rogue River-Siskiyou National Forest, accounting for approximately 95,600 acres of the North Coast Region.

Private timber land accounts for a substantial amount of the region's land area, including lands managed for industrial and non-industrial timber production. The California Board of Equalization reports a total harvest from counties of the North Coast Region of 575,900 MBF or 575,900,000 board feet in 2012. This is more than 40% of the timber harvested in the state. The North Coast Region contains about 57% of California's private lands zoned as Timber Production Zone (Shih 2002).

8.3 Air Quality

According to the California Air Resources Board (Air Board), the North Coast Region contains 3 separate, designated air basins. These include:

1. North Coast Air Basin encompassing Del Norte, Humboldt, Mendocino, Trinity, and substantial portions of Sonoma counties;
2. Northeast Plateau Basin encompassing Modoc, Lassen, and Siskiyou counties; and
3. Lake County Air Basin

The southern portion of Sonoma County is contained in the Bay Area Air Basin.

The pollutants of concern to air quality include: particulate matter (PM), ozone, nitrogen dioxide, sulfates, carbon monoxide, sulfur dioxide, visibility reducing particles, lead, hydrogen sulfide, and vinyl chloride. Statistics for ozone, particulate matter, carbon monoxide, nitrogen dioxide, and hydrogen sulfide are readily

available for the 3 air basins within the North Coast Region, and Sonoma County, as shown in Table 8.2.

Ozone, an important ingredient of smog, is a highly reactive and unstable gas capable of damaging the linings of the respiratory tract. This pollutant forms in the atmosphere through complex reactions between chemicals directly emitted from vehicles, industrial plants, and many other sources. Key pollutants involved in ozone formation are hydrocarbon and nitrogen oxide gases. Particulate matter (PM) is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size and chemical composition, and can be made up of many different materials such as metals, soot, soil, and dust. Particles 10 microns or less in diameter are defined as "respirable particulate matter" or "PM 10." Fine particles are 2.5 microns or less in diameter (PM 2.5) and can contribute significantly to regional haze, reduction of visibility, and respiratory illness. Carbon monoxide (CO) is a colorless, odorless gas. It results from the incomplete combustion of carbon-containing fuels such as gasoline or wood, and is emitted by a wide variety of combustion sources. Sulfur dioxide (SO₂) is a gaseous compound of sulfur and oxygen. SO₂ is formed when sulfur-containing fuel is burned by mobile sources, such as locomotives, ships, and off-road diesel equipment. SO₂ is also emitted from several industrial processes, such as petroleum refining and metal processing. Hydrogen sulfide (H₂S) is a colorless gas with the odor of rotten eggs. It is formed during bacterial decomposition of sulfur-containing organic substances. Also, it can be present in sewer gas and some natural gas, and can be emitted as the result of geothermal energy exploitation.

Table 8.2. 2012 Air Quality Statistics for the 3 Air Basins, and Sonoma County, contained within the North Coast Region⁹

	North Coast Air Basin	Sonoma County	Northeast Plateau Air Basin	Lake County Air Basin
Ozone, # of days > 1-hour CA standard	1	0	0	2
Ozone, # of days > 8-hour CA standard	0	0	1	3
PM2.5, # of days > 24-hour Nat'l standard	0	0	0	0
PM10, # days > 24-hour CA standard	0	*	0	0
Carbon Monoxide, # of days > CA standard	0	*	*	*
Nitrogen Dioxide, # of days > CA standard	0	0	*	*

⁹ <http://www.arb.ca.gov/adam/topfour/topfour1.php>, accessed on August 16, 2013.

Hydrogen Sulfide, # of days > CA standard	*	*	*	0
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*Insufficient data to calculate

As indicated in Table 8.2, the air quality in the North Coast Region is exceptionally good. The California Air Pollution Control Officers Association reports that none of the counties within the North Coast Region had any days in 2012 in which overall air quality was “unhealthy” and all had “good” overall air quality for an average of 349 days of the year (CAPCOA 2013). With respect to ozone, the numbers of exceedences indicated in Table 8.2 are among the lowest of any of the air basins in the State.

8.4 Biological Resources

The mission of the Regional Water Board is to develop and implement water quality standards and programs of implementation designed to restore and maintain the beneficial uses of water within the region. In the North Coast Region, some of the beneficial uses of water that often drive the water quality protection efforts of the agency are Cold Freshwater Habitat (COLD); Spawning, Reproduction, and Early Development (SPWN); Migration of Aquatic Organisms (MIGR); and Rare, Threatened or Endangered Species (RARE). The water quality programs designed to protect these beneficial uses, in turn, are most often driven by the habitat requirements of salmonids.

Salmonidae are a family of aquatic vertebrates which during the freshwater portion of their life cycle require cold, clear, well-oxygenated freshwater, free of excessive fine sediment or obstructions to migration. As such, they are often recognized as indicators of watershed health, where populations are stable. Historically, they were abundant in watersheds of the North Coast Region. Today, populations of several Salmonidae species are listed by federal and state wildlife agencies as threatened or endangered by extinction. Species listed in some or all watersheds of the North Coast Region include: Chinook salmon, coho salmon, and steelhead trout. The proposed program is designed, in part, to protect the COLD, SPWN, MIGR, and RARE beneficial uses.

The Regional Water Board designs its water quality programs to protect other beneficial uses associated with the Region’s biological resources as well, including:

- Warm Freshwater Habitat (WARM)
- Estuarine Habitat (EST)
- Wildlife Habitat (WILD)
- Preservation of Areas of Special Biological Significance (ASBS)
- Wetland Habitat (WET)

The North Coast Region includes numerous threatened and endangered faunal and floral species (T&E species). The presence and disposition of T&E species must be evaluated at the project level to ensure their adequate site specific protection. The

proposed program which is the subject of this CEQA analysis is intended to be implemented in a manner which restores and maintains the beneficial uses of the North Coast Region, including those beneficial uses identified above. As elsewhere in the State, the quantity and quality of wetland habitat has been substantially reduced from historic levels. As such, the restoration and maintenance of the Region's wetland and riparian resources is an important element of the Regional Water Board's effort. Riparian habitat is associated with virtually every waterbody in the North Coast Region. Substantial wetland habitat exists in the upper Klamath River basin, the Laguna de Santa Rosa, Humboldt Bay, Bodega Bay, and associated with the estuaries of most of the rivers in the Region.

Similarly, the water quality protection efforts of the Regional Water Board are intended to support and complement the environmental protection efforts represented in local policies and ordinances, Habitat Conservation Plans, Natural Community Conservation Plans, and other approved local, regional, or state habitat conservation plans. Any project implemented under this proposed program should be designed to avoid, minimize or mitigate any potential impact to biological resources.

8.5 Cultural Resources

The North Coast Region has a rich human history going back perhaps 10,000 years. Lands throughout the Region, therefore have the potential to harbor buried ancient cultural resources. Similarly, there are numerous sites of historic interest scattered throughout the Region, representing the Region's mining, shipping, logging, and agricultural history, among others. The presence and disposition of cultural resources must be evaluated at the project level to ensure their site-specific protection. Any project implemented under this proposed program should be designed to avoid, minimize or mitigate any potential impact to cultural resources.

The Regional Water Board has adopted a Native American Culture (CUL) beneficial use designed to support the cultural and/or traditional rights of indigenous people such as subsistence fishing and shellfish gathering, basket weaving and jewelry material collection, navigation to traditional ceremonial locations, and ceremonial uses. The CUL beneficial use has been designated in the Smith River, Klamath River, Trinity River, Redwood Creek, Mad River, Jacoby Creek, Freshwater Creek, Salmon Creek, Van Duzen River, and Oil Creek watersheds, as well as Trinidad Hydrologic Unit, Humboldt Bay, and Ferndale Hydrologic Subarea. . However, CUL is an existing beneficial use in other locations throughout the Region, which will be designated once the data is collected. The proposed program which is the subject of this CEQA analysis is intended to be implemented in a manner which restores and maintains the beneficial uses of the North Coast Region, including the CUL beneficial use.

8.6 Geology and Soils

The California Geological Survey divides the state into 11 distinct geomorphic provinces. A geomorphic province is a naturally defined geologic region that

displays a distinct landscape or landform. The Klamath River sub-basin includes the Modoc Plateau, Cascade Range, and Klamath Mountain provinces. The North Coastal sub-basin includes the Coastal Range province.

Modoc Plateau Geomorphic Province

The Modoc Plateau is a volcanic table land (elevation 4,000-6,000 feet above sea level) consisting of a thick accumulation of lava flows and tuff beds along with many small volcanic cones. Occasional lakes, marshes, and sluggishly flowing streams meander across the plateau. The plateau is cut by many north-south faults. The province is bound indefinitely by the Cascade Range on the west and the Basin and Range Province on the east and south.

Cascade Range Geomorphic Province

The Cascade Range, a chain of volcanic cones, extends through Washington and Oregon into California. It is dominated by Mt. Shasta, a glacier-mantled volcanic cone, rising 14,162 feet above sea level.

Klamath Mountain Geomorphic Province

The Klamath Mountain Geomorphic Province has rugged topography with prominent peaks and ridges reaching 6,000-8,000 feet above sea level. In the western Klamath, an irregular drainage pattern is incised into an uplifted plateau called the Klamath peneplain. The uplift has left successive benches with gold-bearing gravels on the sides of the canyons. The Klamath River follows a circuitous course from the Cascade Range through the Klamath Mountains. The province is considered to be a northern extension of the Sierra Nevada (CDC 2002). The Klamath Mountain Geomorphic Province consists of four mountain belts: the eastern Klamath Mountain belt, central metamorphic belt, western Paleozoic and Triassic belt, and western Jurassic belt. Low-angle thrust faults occur between the belts and allow the eastern blocks to be pushed westward and upward. The central metamorphic belt consists of Paleozoic hornblende, mica schists, and ultramafic rocks. The western Paleozoic and Triassic belt, and the western Jurassic belt consist of slightly metamorphosed sedimentary and volcanic rocks. This is an uplifted and dissected peneplain on strong rocks; there are extensive monadnock ranges. Elevation ranges from 1,500 to 8,000 ft (456 to 2,432 m). Soils include Alfisols, Entisols, Inceptisols, and Ultisols, in combination with mesic and frigid soil temperature regimes and xeric and udic soil moisture regimes.

Coast Ranges

The Coast Ranges are northwest-trending mountain ranges (2,000 to 4,000, occasionally 6,000 feet elevation above sea level), and valleys. The ranges and valleys trend northwest, subparallel to the San Andreas Fault. Strata dip beneath alluvium of the Great Valley. To the west is the Pacific Ocean. The coastline is uplifted, terraced and wave-cut. The Coast Ranges are composed of thick Mesozoic and Cenozoic sedimentary strata. The northern and southern ranges are separated by a depression containing San Francisco Bay. The northern Coast Ranges are dominated by irregular, knobby, landslide-topography of the Franciscan Complex.

The eastern border is characterized by strike-ridges and valley in Upper Mesozoic strata. In several areas, Franciscan rocks are overlain by volcanic cones and flows of the Quien Sabe, Sonoma and Clear Lake volcanic fields. The Coast Ranges are subparallel to the active San Andreas Fault. The San Andreas is more than 6000 miles long, extending from Point Arena to the Gulf of California (CDC 2002). This area has parallel ranges, and folded, faulted, and metamorphosed strata; there are rounded crests of subequal height. Elevation ranges from 1,000 to 7,500 ft (304 to 2,280 m). Soils include Alfisols, Entisols, Inceptisols, Mollisols and Ultisols in combination with mesic and thermic soil temperature regimes and xeric soil moisture regime.

Tectonics

Of prime significance to the geology and soils of the North Coast Region, are the collision and subduction of the Juan de Fuca tectonic plate under the North American plate and the transform (strike-slip) movement between the Pacific and North American plates along the San Andreas fault, including activity at the Triple Junction where the North American, Gorda, and Pacific plates meet. The tectonic activity of the North Coast Region generally results in steep, unstable slopes and a mixture of consolidated and unconsolidated, marine and continental-derived geology. As a result erosional potential in the North Coast Region can generally be described as high.

8.7 Greenhouse Gas Emissions (GHGs)

Gases that trap heat in the atmosphere are called greenhouse gases (GHGs).¹⁰ The major greenhouse gases of concern include the following:

- *Carbon dioxide (CO₂)*-- Carbon dioxide enters the atmosphere through burning fossil fuels (coal, natural gas and oil), solid waste, trees and wood products, and also as a result of certain chemical reactions (e.g., manufacture of cement). Carbon dioxide is removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.
- *Methane (CH₄)* -- Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.
- *Nitrous oxide (N₂O)* -- Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.
- *Fluorinated gases* -- Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful greenhouse gases that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for stratospheric ozone-depleting substances (e.g., chlorofluorocarbons, hydrochlorofluorocarbons, and halons). These gases are typically emitted in smaller quantities, but because they are potent greenhouse

¹⁰ <http://www.epa.gov/climatechange/ghgemissions/gases.html> accessed August 26, 2013.

gases, they are sometimes referred to as High Global Warming Potential gases ("High GWP gases").

A statewide GHG inventory conducted by the California Air Board indicates that of the total GHG emissions in California in 2004, the categories of GHG sources rank as follows by percent contribution: transportation (38%); electricity generation (25%); industrial processes, including landfills and wastewater treatment (20%); commercial and residential fuel uses (9%); agriculture and forestry (5%); and unspecified emissions (3%). The estimate of agriculture and forestry contributions to GHG emissions includes consideration of the carbon sequestration services provided by trees and rangeland.¹¹

The net GHG emissions in the state increased from 1990 to 2004 by about 12%. The source categories contributing most significantly to the increase in emissions came from electricity generation (19% increase above 1990 contributions from this source category), transportation (21% increase), agriculture and forestry (39% increase) and an increase in unspecified emission sources (1161% increase). These increases were balanced by decreases in other source categories, including decreased emissions from commercial and residential fuel uses (13% decrease) and industrial fuel uses (7% decrease). The Global Warming Solutions Act of 2006 (AB 32) calls for the reduction by 2020 of GHG emissions to California's 1990 levels.

With respect to the analysis of potential environmental impacts associated with this proposed program, the source categories of most interest include: road transportation, electricity generation, landfills, waste water treatment, residential and commercial fuel uses, and agriculture and forestry. A project implemented under this proposed program could result in an increase in GHGs over baseline conditions if it results in an increase in: fuel use associated with transportation, electricity use, land disposal or composting of waste (including wood and agricultural waste), wastewater influent volumes or concentrations, residential or commercial density, or fire potential. A project could result in a decrease in GHGs over baseline conditions if it results in an increase in woody biomass or a decrease in any of the categories listed above.

8.8 Hazards and Hazardous Materials

A CEQA analysis includes evaluation of the project impacts with respect to the use of hazardous substances, proximity to hazardous waste facilities, proximity to airports, likelihood of interfering with emergency response, and potential to expose people to significant wildfire risk.

¹¹ http://www.arb.ca.gov/cc/inventory/archive/tables/ghg_inventory_sector_90-04_sum_2007-11-19.pdf accessed August 26, 2013.

Hazardous Materials

According to the California Department of Toxic Substances Control's (DTSC) website¹² there are no commercial offsite hazardous waste removal facilities in the North Coast Region, except for a used oil and antifreeze facility in the City of Fortuna. Also reported on their website, there are 12 sites in the North Coast Region which are included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. They include: 1 in Del Norte, 2 in Humboldt, 1 in Lake, 3 in Mendocino, 1 in Modoc, 2 in Sonoma, 2 in Siskiyou and 0 in Trinity counties. Further, staff of the Regional Water Board oversees hundreds of groundwater contamination site cleanups in the North Coast Region, including leaking underground storage tank and spill sites. These sites are spread throughout the Region and information about them can be found on the State Water Board's website.¹³

Airports

There are numerous airports throughout the North Coast Region, including 3 passenger airports: the Jack McNamara Field Airport in Del Norte County, the Arcata-Eureka Airport in Humboldt County, and the Charles Schultz Airport in Sonoma County. In addition, there are 22 public use airports found in Cloverdale, Covelo, Eureka (3), Fortuna, Garberville, Gasquet, Gualala, Hayfork, Healdsburg, Hoopa, Hyampom, Klamath Glen, Little River, Sonoma, Trinity Center, Tulelake, Ukiah, Weaverville, and Willits.

Risk of Wildfire

The North Coast Region is predominantly rural and largely vegetated with grassland, woodland, and forest. The California Department of Forestry and Fire Protection (CalFire) has identified hundreds of North Coast communities at risk from wildfires on either federal or non-federal lands. Further, CalFire has identified at least 5 communities as existing in a Very High Fire Hazard Severity Zone, including: Cloverdale, Santa Rosa, Ukiah, Willits, and Yreka. As such, the existing risk to North Coast residents from wildfire can be considered high.

Hazardous Substances and Emergency Response Plans

The baseline condition as it relates to the use of hazardous substance and the availability of a local emergency response plan can only be determined at the project level. Any project implemented under this proposed program should be designed to avoid, minimize or mitigate any potential impact due to hazardous substances.

¹² <http://www.envirostor.dtsc.ca.gov/public/> accessed August 16, 2013.

¹³ <http://geotracker.waterboards.ca.gov/> accessed August 16, 2013.

8.9 Hydrology and Water Quality

Water Quality

The surface water quality issues of most concern in the North Coast Region are excess sediment, elevated water temperatures, and excess nutrients. These water quality conditions are the result of point and non-point sources of pollution and other controllable factors (e.g., landscape alteration, road building, etc.) and are exacerbated by hydrologic modification, water withdrawal, and the loss of competent riparian zones and floodplains to development, agriculture, and logging. Many north coast aquatic ecosystems are impacted by these constituents and controllable factors, resulting in a loss of streamside property to erosion, destruction of water intakes, loss of aquatic habitat and risk to threatened and endangered aquatic species, increased winter flood potential, and increased risk of summer nuisance algal blooms (including microcystis and other cyanobacteria).

There are more localized water quality issues, as well. For example, surface water monitoring indicates a problem with pathogens in Bodega Bay Hydrologic Area, Hare Creek Beach and Pudding Creek Beach on the Mendocino Coast, several coastal beaches in the Trinidad Hydrologic Unit, and riverfront beaches on the Russian River and its tributaries, as well as the Laguna de Santa Rosa and its tributaries. In addition, several of the region's waterbodies are impaired by mercury, including: Lake Pillsbury, the Laguna de Santa Rosa, Lake Sonoma, Trinity Lake, and the East Fork Trinity River. Exotic species are listed as a water quality problem in Bodega Bay and dioxin and PCBs are listed as impairing Humboldt Bay.

In 2009, the USGS, in conjunction with the State Water Resources Control Board, collected untreated groundwater data from 58 wells selected from the California Department of Public Health database within 34 groundwater basins located in the North Coast Region. Wells were randomly selected from Napa, Lake, Mendocino, Glenn, Humboldt, and Del Norte Counties. The results of the study are published in Methany et al. (2011). All detected concentrations of organic constituents, nutrients, major and minor ions, and radioactive constituents were less than health-based benchmarks for the 30 wells sampled in the Northern Coast Ranges. There were a few detections of arsenic, boron, and barium in the 28 wells of the interior basins which exceeded MCLs or notification levels; but, these are likely related to the area's geology. The results of this study indicate that community drinking water systems drawing from primary aquifer systems in the North Coast Region generally provide safe drinking water, with the exceptions noted.

Shallow groundwater, however, has been pervasively contaminated by a long history of activities and operations, primarily: wood treatment facilities, unlined landfills, leaking underground storage tanks, and dry cleaning facilities. In many regions, shallow groundwater is neither used nor useable. But, because the North Coast Region is predominantly rural, many people rely on shallow (sometimes hand-dug) wells for their drinking water. There may be contributions of nutrients and pesticides to shallow groundwater resulting from the continued conversion of

land to vineyards in Sonoma and Mendocino counties and other widespread farming activities in the Upper Klamath River basin and the Smith River plain, among other disperse locations of the region. Aging wastewater treatment ponds and leaking septic tanks play a part in shallow groundwater contamination in the Region, as well. Groundwater is likely to become an increasingly important source of domestic, municipal, and agricultural water supply, as a result of climate change and predicted impacts to surface water discharge volumes and timing.

Hydrology

Because of the low infiltration capacity and permeability of the Franciscan and volcanic rocks common in the North Coast Region, groundwater origin baseflows in streams are sometimes poorly maintained. Along the mountain drainages, baseflow that does occur is maintained by groundwater discharge emerging from fractures through springs and seeps. Some streams may be composed of discontinuous wet reaches with pools sustained over summer by groundwater discharge. Some higher elevation streams may run dry from summer to late fall. As a consequence, flows between these ephemeral streams and the underlying aquifer may periodically cease.

In the valleys, groundwater occurs in the alluvial deposits. There, baseflow is maintained by groundwater discharge along reaches where the water table is higher than the adjacent stream. In the larger valley drainages, such as the Russian River, groundwater discharge is large enough to sustain perennial flow (R2 Resource Consultants & Stetson Engineers, 2007). This is similarly the case in the Klamath River basin. Groundwater pumping for irrigation can impact stream flows; a study in the Scott River watershed indicates that groundwater pumping has impacted Scott River flows.

Groundwater depletion is a potential risk, including for example in the Santa Rosa Plain Groundwater Basin, where a groundwater management plan is being developed under the leadership of the Sonoma County Water Agency. Many rural residents throughout the Region intercept groundwater in fractures or localized alluvium. In these settings, groundwater may be impacted by periodic or seasonal depletion.

Surface flows in the North Coast Region are impacted by numerous water diversions, both permitted and unpermitted, legal and illegal. The State Water Board has adopted the North Coast Instream Flow Policy to better ensure that future water rights permits contain the provisions necessary to protect the stream flows necessary to support salmonids and salmonid habitat. Further, recent collaboration between the staff of the North Coast Region and the Division of Water Rights has resulted in contemporary water rights permits containing provisions specific to the protection of water quality conditions in the North Coast Region, as well. For example, erosion control plans and riparian protection plans are sometimes required in new water rights permits.

On the other end of the spectrum, the North Coast Region contains hundreds of miles of rural private and public roads which sometimes serve to extend the drainage network of the Region's watersheds with inadequate, poorly designed, or failing road drainage features. The result, in some watersheds, has been an increase in peak flows or peak flow timing, accompanied by an increased risk of erosion, sedimentation, and flooding.

Also, with respect to flooding, many of the watersheds of the North Coast Region are still moving quantities of stored sediment first deposited during catastrophic flooding events of 1955 and 1964. Flooding events of 1982, 1995, and 1997 also have had dramatic impact on North Coast rivers.

The California Emergency Management Agency has mapped a tsunami inundation risk for all of Del Norte County, Humboldt County from its border with Del Norte to Ferndale, Mendocino County from Brunel Point to Gualala, and Sonoma County from Russian Gulch to Bodega Head.¹⁴

8.10 Land Use and Planning

As above, it is not the intention of this proposed program to interfere with or supercede any land use plan, policy or regulation of another agency. Any project implemented under this proposed program should be designed in a manner consistent with other applicable land use plans, policies, or regulations.

8.11 Mineral Resources

As elsewhere in the State, the North Coast Region was substantially impacted by the the presence of precious metals, particularly in the Klamath Geomorphic Province where hundreds of gold claims were exercised and where suction dredging is still of interest. Abandoned mines in the Klamath Basin are the focus of cleanup. Further, sand, gravel and other aggregate is a substantial commodity in the North Coast Region, whose extraction has the potential to impact numerous watersheds in the Region.

8.12 Noise

The North Coast Region is substantially rural, with a limited number of larger communities, the largest being Santa Rosa and its surrounding communities in Sonoma County. As a general matter, noise pollution is limited to localized areas. Any project implemented under this proposed program should be designed to avoid, minimize or mitigate any potential noise impacts.

8.13 Population, Housing, and Public Services

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http://www.consrv.ca.gov/cgs/geologic_hazards/Tsunami/Inundation_Maps/Pages/Statewide_Map_s.aspx accessed August 16, 2013.

The North Coast Region includes all residents of Del Norte, Humboldt, Trinity, and Mendocino counties, the majority of Modoc, Siskiyou, and Sonoma counties, and a small percentage of the populations of Glenn, Lake and Marin counties. The population of the entire North Coast Region was about 670,700 in year 2010¹⁵, which is less than 2 percent of California's total population. More than half of this region's population lives in the southern part, primarily in Santa Rosa and the surrounding communities of Cotati, Healdsburg, Rohnert Park, Sebastopol and Windsor along the Russian River watershed. Urban growth in these cities, whose population totaled an estimated 261,485 people in year 2010¹⁶, is heavily influenced by the overall urban expansion of the adjacent San Francisco Bay region. Other smaller communities in the northern portions of this region include Eureka, 27,191; Ukiah, 16,075; Arcata, 17,231; Crescent City, 7,643; and Yreka, 7,765.¹⁷

When compared with the 2000 regional population of 636,000, the 670,300 in 2010 represents a growth rate of 5.4 percent over the 10 years, which is a little over half the statewide growth rate of about 9.7 percent over the same period. Projections today indicate that the regional population is expected to grow to about 809,400 by year 2050, which represents about a 21 percent increase from year 2010 totals. More than half of this projected growth is anticipated to occur in the Santa Rosa region, as urban populations from the San Francisco Bay area continue to expand north. Population increases in the rural communities in the northern portion of this region are projected to grow more slowly.

The North Coast Region has experienced steady population growth over the past two decades and is projected to continue positive growth through the year 2050¹⁸. Due to the rural nature of much of the region and the fact that there is a lower associated cost of living, many communities within the region are seeing an influx of retirees from larger, more urbanized settings. This has placed pressure on existing community services. Additionally, as population densities encroach in the more urban settings, some of the more rural communities are becoming bedroom communities. There is also a rise in migrant workers within the region. Modoc County has a county operated migrant camp. The trend for both Modoc and Siskiyou counties is that many of the migrant workers are becoming permanent residents, while younger non-migrant residents continue to leave the area. Despite the overall growth rates of the Region, population growth rates are not as great as those of the rest of the State, reflecting the rural character of the Region. In fact, some of the more remote counties of the region - Modoc and Siskiyou - are projected to lose overall population in the coming decades. The most populated area of the Region, Sonoma County, experienced a higher growth rate than the State's average in 1980

¹⁵ http://www.dof.ca.gov/research/demographic/state_census_data_center/census_2010/ accessed August 16, 2013.

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ Ibid.

and 1990, and is estimated to continue this pattern with population increases of 14% by 2020.

8.14 Recreation

The Regional Water Board implements water quality protection programs designed to result in water quality suitable for full contact water recreation such as swimming and surfing (REC-1), as well as non-contact water recreation (REC-2). Other beneficial uses potentially relevant to recreational uses include Navigation (NAV), Commercial and Sport Fishing (COMM), and Shell Fish Harvesting (SHELL). As a predominantly rural region, the North Coast Region offers a multitude of recreational opportunities in addition to water-related activities, including camping, hiking, backpacking, horseback riding, bike riding, bird watching, and much more.

8.15 Transportation/Traffic, Utilities and Service Systems

Transportation and Traffic

The North Coast Region is serviced by Districts 1, 2, and 4 of the California Department of Transportation (CalTrans). Highway 101 is the major highway corridor from north to south and Highways 128, 20, 162, 36, 299, and 199 are the major highway corridors from west to east. These highway corridors are 2 and 4 lane highways, vulnerable to traffic delays when road work is undertaken. CalTrans projects currently affecting transportation and traffic include: the Willits Bypass in District 1; on-going maintenance on Hwy 299 and the Anderson Grade Project near Yreka in District 2; and road widening on Hwy 101 through Sonoma County in District 4. Activities associated with the development of the SMART train from Cloverdale in Sonoma County to the Larkspur Landing ferry terminal in Marin County also have the potential to cause traffic congestion as a baseline condition.

Wastewater Treatment Facilities, Water Treatment Facilities, Stormwater Facilities, Landfills

The point source discharge of waste to waters of the Region is prohibited except in the Mad, the Eel, and Russian rivers during the wet weather season. All other wastewater treatment is provided by percolation ponds, evaporation ponds, or other land disposal, including septic systems. Discharge to the Mad, Eel and Russian rivers is further limited to 1% of river flow. Many of the wastewater treatment systems, including septic systems, in the North Coast Region are very old and require upgrade.

Water is abundant in many parts of the North Coast Region. According to Methany et. al. (2011), community water delivery systems in the North Coast Region provide good drinking water to their customers. Many residents of the North Coast Region, however, rely on private domestic wells, surface water intakes, or small community systems; except in localized areas, water availability is generally good and is sometimes consumed untreated. The Regional Water Board implements water quality protection programs designed to result in water resources which are

suitable as drinking water, as defined by the Municipal and Domestic Supply (MUN) beneficial use.

The Regional Water Board oversees implementation of NPDES permits for the control of stormwater from industrial facilities, construction sites, and municipalities. These primarily rely on best management practices (BMPs) to avoid, reduce and mitigate the impacts of stormwater discharge. The City of Santa Rosa, Sonoma County, and Sonoma County Water Agency implement an extensive stormwater control program under their MS4 permit issued by the Regional Water Board.

All the landfills in the North Coast Region have been closed, except the Meecham Road Landfill in Sonoma County. Transfer stations are operated throughout the rest of the region with much of the waste material transferred outside the Region for disposal.