3.3.11 Air Quality

The discussion of air quality is broken into four sections. First, the affected environment is discussed in Section 3.3.11.1. Second, the environmental effects of the Project are described in Section 3.3.11.2. Third, proposed conditions for the Project are listed in Section 3.3.11.3. Finally, unavoidable adverse impacts are addressed in Section 3.3.11.4.

Existing, relevant and reasonably available information is sufficient to determine the potential effects of the Project on air quality. FERC's Study Determination, as amended, did not require YCWA to perform any studies related to air quality.

3.3.11.1 Affected Environment

This section describes existing air resources conditions in two general areas: 1) regulatory context; and 2) existing air quality conditions.

3.3.11.1.1 Regulatory Context

The California Air Resources Board (CARB), as part of the California Environmental Protection Agency (Cal EPA), is responsible for protecting public health and the environment from the harmful effects of air pollution. Pollutants associated with air emissions, such as ozone (O_3), particulate matter and nitrogen dioxide (NO_2), are associated with respiratory illness. Carbon monoxide (CO), another air pollutant, can be absorbed through the lungs into the bloodstream and reduce the ability of blood to carry oxygen. Sources of air emissions include commercial facility operations, fugitive dust, on-road vehicles and trucks, aircraft, boats, trains, and natural sources such as biogenic and geogenic hydrocarbons and wildfires.

The topography and meteorology of the western slope of the Sierra Nevada is the important factors in the environmental effects of air quality emissions in the vicinity of the Project. Dispersion of high pollutant concentrations in downwind areas is hindered by the mountainous topography. Frequent inversions, in which warm air overlays cool air, trap pollutants close to the ground. In summer, long days, stagnant air and high temperatures facilitate photochemical production of ozone from precursor air pollutants such as volatile organic compounds (VOC) and nitrogen oxides (NO_x). Regional transport of these precursors from the Sacramento Valley and the San Francisco Bay area result in high ozone concentrations.

To reduce harmful exposure to air pollutants, the federal Clean Air Act (CAA) requires the USEPA to set outdoor air quality standards for the nation with the option for states to adopt additional or more protective standards if needed. CARB has adopted ambient (outdoor) air quality standards (AAQS) that are more protective than federal standards and has implemented standards for some pollutants not addressed by federal standards. An AAQS establishes the concentration above which the pollutant is known to cause adverse health effects to sensitive groups within the greater population, such as children and the elderly. The goal is for localized effects not to cause or contribute to an exceedance of the standards. Criteria pollutants for which AAQS have been established include ozone, particulate matter, carbon monoxide, nitrogen

dioxide, sulfur dioxide and lead. California and federal AAQS for criteria pollutants are presented in Table 3.3.11-1.

Table 3.3.11-1. California and federal ambient air quality standards.

Pollutant	Averaging Time	California Standards[1]		Federal Standards[2]		
		Concentration[3]	Method[4]	Primary[3,5]	Secondary[3,6]	Method[7]
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	--	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m^3)		0.075 ppm (147 µg/m^3)		
Respirable Particulate Matter (PM10)	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		--		
Fine Particulate Matter (PM2.5)	24 Hour	No Separate State Standard		35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	15.0 µg/m^3		
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	--	Non-Dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		--	--	--
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m^3)	Same as Primary Standard	Gas Phase Chemiluminecence
	1 Hour	0.18 ppm (339 µg/m^3)		0.100 ppm (see footnote 8)		
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	--	Ultraviolet Fluorescence	0.030 ppm (80 µg/m^3) (see footnote 9)	--	Spectrophotometry (Pararosaniline Method)
	24 Hour	0.04 (105 µg/m^3)		0.14 ppm (365 µg/m^3)	--	
	3 Hour	--		--	0.5 ppm (1,300 µg/m^3)	
	1 Hour	0.25 (665 µg/m^3)		75 ppb (see footnote 9)	--	--
Lead[10]	30 Day Average	1.5 µg/m^3	Atomic Absorption	---	--	--
	Calendar Quarter	--		1.5 µg/m^3	Same as Primary Standard	High Volume Sampler and Atomic Absorption
	Rolling 3-Month Average[11]	--		0.15 µg/m^3		
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer - visibility of 10 miles or more (0.07 - 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		No Federal Standards		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			

Table 3.3.11-1. (continued)

Pollutant	Averaging Time	California Standards[1]		Federal Standards[2]		
		Concentration[3]	Method[4]	Primary[3,5]	Secondary[3,6]	Method[7]
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence	No Federal Standards		
Vinyl Chloride[10]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

[1] California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter—PM10, PM2.5 and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards (AAQS) are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[2] National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than 1. For PM2.5, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. National AAQS are listed in the Code of Federal Regulations, Title 40, Part 50.

[3] Concentration expressed first in units in which the standard was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to parts per million (ppm) by volume, or micromoles of pollutant per mole of gas.

[4] Any equivalent procedure that can be shown to the satisfaction of the California Air Resources Board (CARB) to give equivalent results at or near the level of the air quality standard may be used.

[5] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

[6] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[7] Reference method as described by the EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the EPA.

[8] To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010).

[9] On June 2, 2010, the EPA established a new 1-hour SO_2 standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. The EPA also proposed a new automated Federal Reference Method (FRM) using ultraviolet technology, but will retain the older pararosaniline methods until the new FRM have adequately permeated State monitoring networks. The EPA also revoked both the existing 24-hour SO_2 standard of 0.14 ppm and the annual primary SO_2 standard of 0.030 ppm, effective August 23, 2010. The secondary SO_2 standard was not revised at this time; however, the secondary standard is undergoing a separate review by the EPA. Note that the new standard is in units of parts per billion (ppb). California standards are in units of ppm. To directly compare the new primary national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

[10] The CARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[11] National lead standard, rolling 3-month average: final rule signed October 15, 2008.

Both the California and federal governments use ambient air monitoring data to classify areas according to their attainment status with respect to criteria pollutants. These designations are used to identify areas with air quality problems and help determine whether Project emissions would be considered significant under NEPA and CEQA assessments. The three basic designation categories are:

- Attainment—ambient air quality is not in violation of the established standard for the specific criteria pollutant.
- Non-attainment—ambient air quality violates the established standard for the specific criteria pollutant.
- Unclassified—there is currently insufficient data for determining attainment or non-attainment.

In addition to the above designations, California includes a sub-category of the non-attainment designation:

- Non-attainment-transitional—given to non-attainment areas that are making progress and nearing attainment.

Existing Air Quality

To manage air quality problems, California is divided into 15 air basins, each of which is associated with one or more Air Quality Management Districts. Sierra and Nevada Counties are within the Northern Sierra Air Quality Management District, while Yuba County is within the Feather River Air Quality Management District (Cal EPA 2013). Table 3.3.11-2 shows the current federal and State attainment status for each pollutant in each county.

Table 3.3.11-2. Attainment status for air quality pollutants in Nevada, Sierra and Yuba counties.[1]

Pollutant	State Attainment Status			National Attainment Status		
	Yuba	Sierra	Nevada	Yuba	Sierra	Nevada
Ozone (1 hr)[2]	Non-Attainment	Unclassified	Non-Attainment	--	--	--
Ozone (8 hr)	Non-Attainment	Unclassified	Non-Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Non-Attainment
Carbon Monoxide	Unclassified	Unclassified	Unclassified	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment
Nitrogen Dioxide	Attainment	Attainment	Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment
Fine Particulate Matter (PM2.5)	Attainment	Unclassified	Unclassified	Non-Attainment	Unclassified/ Attainment	Unclassified/ Attainment
Respirable Particulate Matter (PM10)	Non-Attainment	Non-Attainment	Non-Attainment	Unclassified	Unclassified	Unclassified
Sulfur Dioxide	Attainment	Attainment	Attainment	Unclassified	Unclassified	Unclassified
Lead	Attainment	Attainment	Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment
Sulfates	Attainment	Attainment	Attainment	No Federal Standards		
Hydrogen Sulfide	Unclassified	Unclassified	Unclassified			
Visibility Reducing Particles	Unclassified	Unclassified	Unclassified			

Sources: CARB 2013; Environmental Protection Agency Green Book 2012.

[1] Each of the counties is in a different air basin. Specifically, Yuba and Nevada Counties are in the Sacramento Valley air basin, and Sierra County is in the Mountain Counties air basin. Classifications are considered under both counties and air basins; therefore, the classifications may differ significantly between counties.

[2] The federal 1-hour ozone rule was vacated on June 15, 2005.

3.3.11.2 Environmental Effects

The proposed Project would have a less-than-significant adverse effect on air quality. The existing Project is situated within geographic areas that are currently designated as non-attainment for 8-hour ozone and non-attainment for PM_{10}. Operations of the proposed Project would not result in a net increase of any criteria pollutant.

The proposed Project includes the addition of the New Bullards Bar Dam New Low level Outlet and various recreation facilities. These are very minor, short-term construction projects, and YCWA will consult with local air quality agencies to obtain all necessary permits and approvals prior to initiating construction.

Greenhouse gas (GHG) emissions associated with development of hydroelectric systems has been a topic of study by the International Hydropower Association since 2006. A Working Group established to initiate such studies published in April 2008, "*Scoping Paper Assessment of Greenhouse Gas Status of Freshwater Reservoirs*" in which it was observed that reservoirs that were 5 years or less in age emitted higher levels of GHG, principally methane, than reservoirs 10 years and older. Although there is a wide range of variables associated with reservoir conditions, the GHG emissions from reservoirs the older reservoir emissions were comparable to natural lakes. This observation was verified in a study performed by Pelletier et al. 2009 for the Hydro-Quebec Eastmain 1 Project.

With regard to YCWA's proposed Project, the reservoirs have been in existence for well over 45 years. Therefore, environmental effects associated with GHG emissions are less than significant.

3.3.11.3 Proposed Environmental Conditions

3.3.11.3.1 Conditions Recommended by YCWA

YCWA's proposed Project would have a less than significant effect on air quality overall. Therefore, YCWA does not propose any conditions related to air resources.

3.3.11.3.2 Proposed Measures and Studies Recommended by Agencies or Other Relicensing Participants That Were Not Adopted by YCWA

[Relicensing Participants – This is a placeholder in the Draft License Application. This section will be completed in the Final License Application. YCWA]

3.3.11.4 Unavoidable Adverse Effects

Construction of YCWA's proposed New Bullards Bar Dam New flood control outlet, New Colgate Powerhouse TDS and various recreation facilities may result in short-term, site-specific adverse effects on air quality. However, since YCWA will obtain all necessary agency permits and approvals for the work, and given the remote location of the facilities, brief period of work and type of construction activity, the effects on air quality are expected to be minor. YCWA's proposed Yuba River Development Project would not create any other short-term or any long-term adverse impacts related to air quality.

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