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8.15 AIR QUALITY ENVIRONMENTAL EFFECTS

This section describes potential impacts to air quality under the Proposed Action for the Middle Fork American River Project (MFP or Project). Section 4.0 – Proposed Action (including Tables 4-4, 4-5, and 4-6) provides a description of routine operation and maintenance activities to be implemented under the Proposed Action compared to the No-Action Alternative. Appendix A – Modified or New Facilities Construction Activities and Concept Designs includes a description of facility modification and construction activities, as well as avoidance and protection (AP) measures, to be implemented under the Proposed Action.

Potential impacts to air quality have been identified based on changes in routine Project operations and maintenance activities, implementation of non-routine recreation facility activities, and modification of existing or construction of new facilities. Specifically, impacts to air quality include:

- Short-term impacts associated with emissions produced during construction; and
- Long-term impacts associated with emissions produced during routine operation and maintenance of the Project over the term of the new license.

Changes in Project operations under the Proposed Action and related greenhouse gas (GHG) emissions impacts are discussed in Section 9.0 – Cumulative Effects Analysis.

A description of potential impacts to air quality from implementation of the Proposed Action is provided below. Unavoidable adverse effects are also discussed at the end of this section.

8.15.1 Approach

The following section describes the approach used to determine air quality impacts associated with emissions from construction activities and routine operations and maintenance.

8.15.1.1 Construction Emissions

Under the Proposed Action, several construction projects will be implemented to improve operations and maintenance of the MFP, enhance environmental resources, and/or meet the requirements specified in new environmental programs and measures. The construction projects include modifications to existing Project facilities and features and construction of new Project facilities and features. Construction projects analyzed in this section are identified below and described in Section 4.0 – Proposed Action and Appendix A – Modified or New Facilities Construction Activities and Concept Designs.

- Hell Hole Reservoir Seasonal Storage Increase Improvement;
- Small Diversion Modifications; and
- Outlet Works Modifications.

Construction emissions were estimated for the individual projects listed above. Information developed as part of the Proposed Action was used to identify equipment and vehicles proposed for use during construction activities. Information in Appendix C3 – Construction Air Quality Emissions Model presents, for each project, the estimated construction schedule, the proposed type of construction equipment needed, estimated construction-use hours or miles per day, and the number of days of anticipated use. To further refine the analysis, all engines were categorized into on-road and off-road applications. Off-road equipment was further defined by engine brake horsepower rating and on-road vehicles defined by light duty (LD), medium duty (MD), and heavy, heavy duty (HHD) weight class. Equipment manufacturers' databases and marketing websites were used to identify the engine size for each piece of equipment. Manufacturer sources included Caterpillar, John Deere, FMC, and Morbark.

Using this information, Project-specific emissions were calculated using the California Air Resources Board's (CARB) Emissions Factors (EMFAC) model and OFFROAD model, based on 40 CFR 86 et seq. and 40 CFR 89, respectively, as preprocessed by the South Coast Air Quality Management District (SCAQMD). The SCAQMD emission factors were used for this assessment because: (1) the Placer County Air Pollution Control District (PCAPCD) does not publish their own emission factors; (2) the SCAQMD emission factors are widely used for both federal and state projects; and (3) these factors represent the most conservative (worst-case) conditions for emission estimates.

The emission estimations incorporate other conservative assumptions to evaluate a reasonable worst-case scenario, including the following:

- Where equipment model numbers are not specific, the largest machine for the class was selected.
- Where a specific engine size for a particular machine could not be determined due to various options, the largest engine size available was selected.
- Because the timing of construction (Table 8.15-1) is not specific as to the exact year, the estimations assumed a worst-case timing that would produce the maximum annual emissions. This is projected to involve four of the projects being constructed in Year 2 and the other three in Year 3.

Annual emissions (tons/year) were estimated for the following criteria pollutants:

- Ozone (O₃);
- Carbon Monoxide (CO);
- Oxides of Nitrogen (NO_x);
- Sulfur Dioxide (SO₂);
- Particulates (PM₁₀); and
- Particulates (PM_{2.5}).

To evaluate the impact of the Proposed Action on air quality, estimated emissions were compared to significance thresholds (federal, state, and county) identified in Table 8.15-2. The significance criteria are based on the attainment status of criteria pollutants and the conformity determinations for federal actions (40 CFR 51.853).

In addition, annual emissions (tons/year) were also estimated for the following parameters (greenhouse gases [GHG]):

- Carbon Dioxide (CO₂);
- Methane (CH₄);
- Nitrous Oxide (N₂O);
- Carbon Dioxide Equivalent (CO₂e); and
- Fugitive Dust (PM₁₀ and PM_{2.5}).

Operational impacts of the Proposed Action on greenhouse gases emissions are discussed in Section 9.0 – Cumulative Effects Analysis.

8.15.1.2 Routine Operation and Maintenance Emissions

To determine the impact to air quality from routine operation and maintenance activities, Placer County Water Agency (PCWA): (1) identified additional staff necessary to implement the Proposed Action; and (2) assessed the annual emissions associated with the additional staff.

8.15.2 Short-term Impacts – Construction

Project construction has the potential to temporarily affect air quality. Impacts to air quality will result from engine exhaust and fugitive dust emissions caused by operation of off-road construction equipment and on-road vehicles. A summary of construction equipment, construction duration, and emission calculations for each construction project is provided in Appendix C3 – Construction Air Quality Emissions Model. In addition to criteria pollutants, emissions of greenhouse gases are also estimated.

Table 8.15-3 summarizes the estimated construction emissions for criteria pollutants and fugitive dust, as well as, the corresponding federal, state, and local thresholds. The estimates assume a worst-case timing that would produce the maximum annual emissions (i.e., four of the projects will be constructed in Year 2 and the other three in Year 3). As depicted, annual emissions during construction under the Proposed Action are well below all established thresholds for criteria pollutants and fugitive dust.

Table 8.15-3 also summarizes the estimated GHG construction emissions. There are no established thresholds for GHGs. As a benchmark, California's carbon dioxide equivalent (CO₂e) emissions from fuel combustion in 2007 were estimated at 461,000,000 tons (Table 7.15-3). Short-term construction activities associated with the Proposed Action will minimally contribute to this State total at 758 tons per year (0.0002%).

Construction emissions will be temporary and intermittent, and will cease upon completion of work. Emissions will also be dispersed over a large area that is sparsely populated. PCWA will comply with all applicable PCAPCD rules and regulations regarding construction emissions, including permitting of portable engines greater than 50 horsepower, and compliance with District Rule 228 for fugitive dust and Rule 202 for diesel smoke from engines. In addition, standard construction air quality control measures are included in each Project construction plan (Refer to Appendix A – Modified or New Facilities Construction Activities and Concept Designs). Therefore, the environmental effects on air quality associated with construction activities implemented under the Proposed Action are considered negligible.

8.15.3 Long-term Impacts – Operation and Maintenance

Existing routine operation and maintenance activities of the MFP result in emissions associated with worker-commuting traffic to and from the facility; worker traffic associated with annual scheduled outage maintenance and repairs; temporary generator use; and off-road maintenance equipment including graders and backhoes.

As of October 2009, PCWA had 179 full-time employees, of which 18 are assigned to the Power Division in support of the MFP administration, engineering, operations, and maintenance. Of the 18, 16 work out of PCWA's Foresthill office while two reside year-round at the operator cottages located near Hell Hole Reservoir.

PCWA's workforce will increase by three full-time employees to implement the Proposed Action over the term of the new license. These employees will work out of offices in either Auburn or Foresthill. Traffic trips and emissions associated with this additional workforce will result in an increase in emissions; however, this incremental increase is considered negligible.

8.15.4 Unavoidable Adverse Effects

There are no unavoidable adverse effects to air quality under the Proposed Action.

LITERATURE CITED

Bay Area Air Quality Management District (BAAQMD). 2009. CEQA Air Quality Guidelines. December 10.

South Coast Air Quality Management District (SCAQMD). 2008. CEQA Air Quality Handbook. Available online at: <http://www.aqmd.gov/ceqa/hdbk.html>

United States Environmental Protection Agency (EPA). 2006. Compilation of Air Pollution Emission Factors (AP-42), Fifth Edition (1995–2006). Available online at: <http://www.epa.gov/ttn/chief/ap42/>

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TABLES

Table 8.15-1. Project Construction Timing and Modeling Assumptions.

Construction Project	Construction Schedule	Conservative Model Assumptions
Hell Hole Reservoir Seasonal Storage Increase Improvement		
Hell Hole Reservoir Seasonal Storage Increase Improvement	Year 3, 4, or 5	Year 3
Small Diversion Modifications		
Duncan Creek Diversion Dam Modification	Year 2 or 3	Year 2
North Fork Long Canyon Diversion Dam Modification	Year 3 or 4	Year 3
South Fork Long Canyon Diversion Dam Modification	Year 3 or 4	Year 3
Outlet Works Modifications		
French Meadows Dam Outlet Works Modification	Year 1 or 2	Year 2
Hell Hole Dam Outlet Works Modification	Year 2 or 3	Year 2
Middle Fork Interbay Dam Outlet Works Modification	Year 1 or 2	Year 2

Table 8.15-2. Emissions Significance Thresholds.

Criteria Pollutant	Federal	State	PCAPCD ³	
	Threshold (tons/yr) ¹	Threshold (tons/yr) ²	Threshold (tons/yr)	Threshold (lbs/day)
Ozone (O ₃) (8-hour)	25	40	40	82*
Carbon Monoxide (CO)	100	100	100	-
Oxides of Nitrogen (NO _x as NO ₂)	100	40	40	82
Oxides of Sulfur (SO _x as SO ₂)	100	40	40	-
Particulates (PM ₁₀)	100	15	15	82
Particulates (PM _{2.5})	100	10	10	-

Notes:

Assumes all seven project sites are located in Mountain Counties Air Basin.

¹Federal thresholds from conformity determinations for federal actions: 40 CFR 51.853.

²40 CFR 51.166 (July 30, 2010).

³Placer County Air Pollution Control District (PCAPCD):

tons/yr: Definition of significant from Rule 502 New Source Review (as amended 2/11/10) PM_{2.5} (10 tons/yr) for direct emissions.

lbs/day: Project-level CEQA thresholds of significance for short-term construction emissions, assuming PM₁₀ from equipment emissions only (excludes fugitive dust).

*As a reactive organic gas (ROG)

Table 8.15-3. Summary of Construction Emissions.

Criteria Pollutant	Highest Peak Any Project (lbs/day)	Total All Projects (tons/yr)	Worst Case Annual Emissions (tons/yr)		Federal Thresholds		State & PCAPCD Thresholds		
			Year 2	Year 3	tons/yr	Exceedance (yes/no)	tons/yr	lbs/day	Exceedance (yes/no)
Volatile Organic Compounds (VOC as CH ₄)	9	0.8	0.3	0.5	25	No	40	82	No
Carbon Monoxide (CO)	40	4.6	1.7	2.9	100	No	100	-	No
Oxides of Nitrogen (NO _x as NO ₂)	67	3.4	1.3	2.1	100	No	40	82	No
Oxides of Sulfur (SO _x as SO ₂)	0.1	0.0	0	0.00	100	No	40	-	No
Combustion Particulates (C-PM ₁₀)	4	0.2	0.1	0.15	100	No	15	82	No
Combustion Particulates (C-PM _{2.5})	4	0.2	0.1	0.13	100	No	10	-	No
Carbon Dioxide (GHG – CO ₂)	9,179	747	280	467	-	-	-	-	-
Methane (GHG – CH ₄)	0.7	0.06	0.02	0.04	-	-	-	-	-
Nitrous Oxide (GHG – N ₂ O)	0.4	0.03	0.01	0.02	-	-	-	-	-
Carbon Dioxide Equivalents (CO ₂ e)	9,309	758	284	474	-	-	-	-	-
Fugitive Dust (F-PM ₁₀)	165	6.7	2.5	4.2	-	-	-	-	-
Fugitive Dust (F-PM _{2.5})	23	0.8	0.3	0.5	-	-	-	-	-

Sources:

SCAQMD 2008, BAAQMD 2009, EPA 2006, EPA 2009.

Notes:

Highest Peak (lb/day) = highest daily emissions, for any of the 7 projects

Total All Projects (tons/yr) = Total emissions for all 7 projects

Worst Case Emissions assumes the highest combination of concurrent projects to produce highest potential emissions:

Year 2: Duncan Creek Diversion Dam Modification, French Meadows Outlet Works Modification, Hell Hole Outlet Works Modification, and Middle Fork Interbay Dam Outlet Works Modification.

Year 3: Hell Hole Reservoir Seasonal Storage Increase Improvement, North Fork Long Canyon Diversion Dam Modification, South Fork Long Canyon Diversion Dam Modification.

Fugitive dust and combustion particulates are evaluated separately.