

Appendix B

California Emissions Estimator Model
(CalEEMod) Assumptions, Methodology,
and Results

Reading Island Boat Ramp
Improvement Project

This appendix contains the assumptions, methodology, and results of the California Emissions Estimator Model (CalEEMod) outputs for proposed construction activities related to the proposed Reading Island Boat Ramp Improvement Project (herein referred to as the 'proposed project'). A CalEEMod model summary report is available upon request (rperry@westernshastarc.org).

1.0 Methods and Assumptions

CalEEMod version 2022.1.1.26 (last accessed October 3, 2024) was used to quantify potential criteria pollutant emissions from construction activities related to the proposed project located in Shasta County, which includes the following features (see Figure 1):

- Boat ramp and launch area improvements
- Gravel shoulder area improvements
- Entrance gate replacement
- ADA-compliant parking spaces
- Staging/spoils
- Overflow Parking Lot (optional)
- Restrooms (optional)

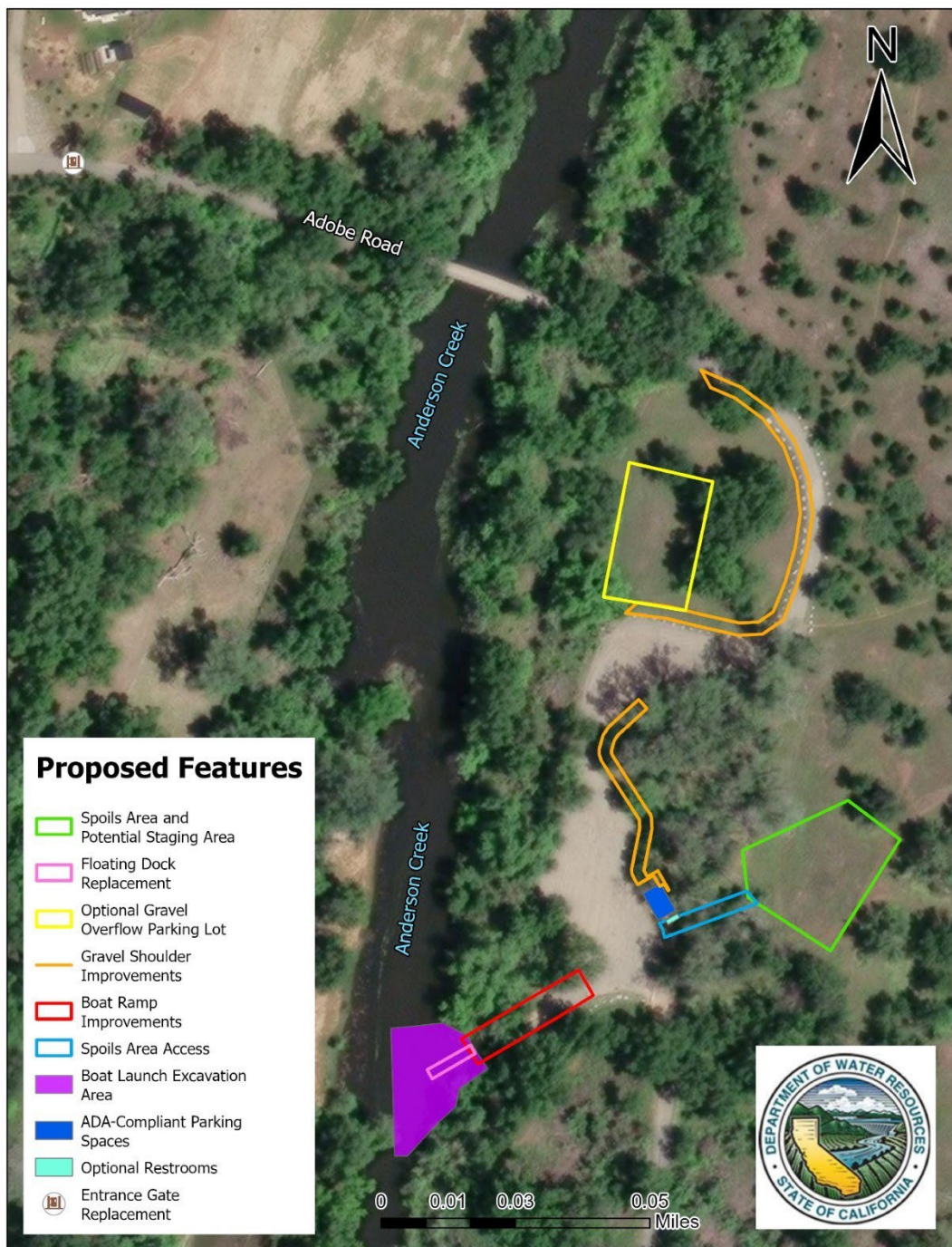
Table 1 lists the criteria pollutants and greenhouse gases (GHG) selected for CalEEMod model outputs (herein referred to as the 'model'), as well as pollutant and GHG thresholds.

Table 1. Construction phases, duration, and anticipated equipment for the proposed Reading Island Boat Ramp Improvement Project.

Criteria Pollutant	Shasta County Air Quality Management District (SCAQMD) Threshold Level A	SCAQMD Threshold Level B	Assembly Bill 32 Threshold
Reactive organic gases (ROG)	25 pounds per day (lbs/day)	137 lbs/day	NA
Nitrogen oxides (NOx)	25 lbs/day	137 lbs/day	NA
Particulate matter 10 Total (PM ₁₀)	80 lbs/day	137 lbs/day	NA
CO ₂ equivalent (CO ₂ e)	NA	NA	25,000 metric tons per year (MT/year)

Inputs for the estimated amount of imported and exported material, anticipated equipment, equipment usage hours, construction days, total fuel consumption, and travel distance are based upon reasonable assumptions reflected in the Inventory and Calculation of Greenhouse Gas Emissions spreadsheet (provided separately as Appendix C of the November 2024 Administrative Draft Environmental Assessment/Initial Study [DOI-BLM-CA-N060-2024-0012-EA]) for the GHG emissions estimates also used for the proposed Project's air quality analysis.

Figure 1. Map of Proposed Project Features.



1.1 Land Use

'Recreational – User Defined Recreation' was selected as the most appropriate land use type to represent the proposed project within the model. The total Lot Acreage value of 0.92-acre represents ground disturbance for proposed project features.

1.2 Construction

1.2.1 Construction Phases and Off-Road Equipment

Table 2 lists the construction phases, duration and equipment used in the model, which replaced the model's default equipment lists. The model default of 8-hours per day was changed to 12-hours per day and horsepower values for equipment were also changed to match the values in the Inventory and Calculation of Greenhouse Gas Emissions spreadsheet.

Table 2. Construction phases, duration, and anticipated equipment that would be used for the Reading Island Boat Ramp Improvement Project.

Phase Name	Phase Type	Days	Equipment	Max # per Day
Mobilization	Site Prep	3	See Section 1.2.4	See Section 1.2.4
Vegetation Clearance	Site Prep	5	chainsaw	3
In-Water Excavation	Grading	4	Excavator	1
In-Water Excavation	Grading	4	Dozer	1
In-Water Excavation	Grading	4	haul truck	3
Dock and Gangway	Building Construction	2	Crane	1
Boat Ramp and Parking Lot Improvements	Grading	4	Excavator	2
Boat Ramp and Parking Lot Improvements	Grading	4	Dozer	1
Restrooms	Building construction	3	Cement mixer	1
Restrooms	Building construction	3	Dozer	1
Restrooms	Building construction	3	Excavator	1
Entrance Gate Replacement	Building Construction	2	Jackhammer	1
Entrance Gate Replacement	Building Construction	2	Cement mixer	1
Entrance Gate Replacement	Building Construction	2	Excavator	1
Demobilization	Site Close	2	See Section 1.2.4	See Section 1.2.4

Table 3 reflects a potential schedule for the proposed project, based on phases and durations listed in Table 2.

Table 3. Construction schedule used for the Reading Island Boat Ramp Improvement Proposed Project.

Phase Name	Phase Type	Start Date	End Date
Mobilization	Site Prep	9/1/2025	9/3/2024
Vegetation Clearance	Site Prep	9/3/2025	9/9/2025
In-Water Excavation	Grading	9/9/2025	9/12/2025
Dock and Gangway	Building Construction	9/15/2025	9/16/2025
Boat Ramp and Parking Lot Improvements	Grading	9/17/2025	9/22/2025
Restrooms	Building construction	9/23/2025	9/25/2025
Entrance Gate Replacement	Building Construction	9/25/2025	9/26/2025
Demobilization	Site Prep	9/29/2025	9/30/2025

1.2.2 Material Movement

Table 4 lists the estimated amount of material and material type that would be moved (i.e., imported, exported, and/or spoiled onsite) during each phase of construction. Onsite spoiling of materials was not an input option in the model, as it does not influence 'Trips and Vehicle Miles Traveled'. It was determined that water trucks would not be needed during construction.

Table 4. Estimated material that would be imported, exported, and spoiled onsite during construction of the Reading Island Boat Ramp Improvement Proposed Project.

Construction Phase Name	Imported Material (Cubic Yards)	Imported Material (Type)	Exported Material (Cubic Yard)	Exported Material (Type)	Onsite Spoils Material (Cubic Yards)	Onsite Spoils Material (Type)
In-Water Excavation	0	Not applicable	0	Not applicable	500	Accumulated in-water debris
Boat Ramp and Parking Lot Improvements	352	Gravel	0	Not applicable	70	Vegetative debris, soil/substrate
Boat Ramp and Parking Lot Improvements	10	Cement	0	Not applicable	0	Not applicable
Restrooms	6	DG, cement	0	Not applicable	15	Vegetative debris, soil/substrate
Entrance Gate Replacement	0.3	Gravel, cement	0	Vegetative debris, soil/substrate	0	Not applicable

1.2.3 Demolition

No demolition activities would occur and therefore were not included in the model for construction-related activity.

1.2.4 Trips and Vehicle Miles Traveled

Table 5 provides a breakdown of the estimated trips and vehicle miles traveled. It was estimated that there would be 4 workers per day and 4 light duty trucks (LDA, LDT) per day that would travel 15 miles one-way to reach the proposed project location during construction over approximately 22 to 25 days. Worker/workforce trips were included for

all construction phases for a total of approximately 3,000 miles traveled. It was estimated that delivery and pickup of equipment and materials would require approximately 46 medium-to-heavy duty truck trips (MHDT, HHDT) and approximately 3,160 miles traveled.

Table 5. Estimated truck trips and vehicle miles during construction of the Reading Island Boat Ramp Improvement Proposed Project.

Trip Type	Vehicle Type	Total Number of Round Trips	Average Trip Distance (round-trip in miles)	Total Miles
Workforce	LDA, LDT1, LDT2	100	30	3,000
Imported Gravel Delivery	MHDT	20	30	600
Delivery of dock/gangway	HHDT	2	920	1840
Heavy equip delivery	HHDT, MHDT	8	30	240
Fuel delivery/other	MHDT	4	30	120
Portable restroom delivery	MHDT	4	30	120
Pickup of heavy equipment	HHDT, MHDT	8	30	240

Notes: LDA=light duty automobile; LDT1=light duty truck type 1; LDT2=light duty truck type 2; MHDT=medium-heavy duty truck; HHDT=heavy-heavy duty truck

1.2.5 On-Road Fugitive Dust

Construction-related travel of light-duty and heavy-duty vehicles by workers, vendors, and haul trucks delivering material would primarily occur on paved roads. The model default values were not changed.

1.2.6 Architectural Coatings

Architectural coatings are not applicable and were not included in the model for construction-related activity.

1.2.7 Electricity

The model default values were not changed.

1.2 Operations

Operations and maintenance factors within the model that are irrelevant to long-term activities associated with the proposed project include hearth, consumer products, architectural coatings, refrigerants, and emergency generators and fire pumps.

Operations and maintenance factors within the model that may be relevant to long-term activities associated with the proposed project include trips and vehicle miles traveled, fleet mix, vehicle emissions, road dust, off-road equipment, landscape equipment, energy use, water and wastewater, and solid waste.

Operations and maintenance of the proposed project were not included in the model output for the following reasons:

- Use of the boat ramp is anticipated to be similar to use levels before the boat ramp was vandalized, as the number of vehicles would be limited by the size of the parking lot. Operations emissions from vehicles accessing the boat ramp area are, therefore, not anticipated to generate substantial pollutant concentrations.
- Maintenance of the Reading Island Recreation Area, including maintenance of the parking lot and existing group campground facilities, as well as vegetation management, would continue to occur under BLM's existing "Redding Field Office – Road, Trail, and Facilities Maintenance" Categorical Exclusion (U.S. Bureau of Land Management 2018).
- Maintenance to excavate the boat launch area would require similar off-road equipment to the list provided for construction activities (see Table 1). The estimated life of the proposed project is approximately 5 years. If boat launch excavation is needed, that activity would be analyzed as a separate proposed project.

1.3 Vegetation

1.3.1 Land Use Change

No change to land use would occur, so the Vegetation – Land Use Change screen was left blank.

1.3.2 Sequestration

No new trees would be planted as part of the proposed project, so the Sequestration screen was left blank.

1.4 Measures

1.4.1 Construction Measures

Table 6 lists air quality-related measures selected in the model that aligned with proposed measures in the November 2024 Administrative Draft Environmental Assessment/Initial Study (DOI-BLM-CA-N060-2024-0012-EA) for the proposed project.

Table 6. Air quality measures to be implemented during construction for the proposed Reading Island Boat Ramp Improvement Project.

EA/IS Measure	Description of EA/IS Measure	CalEEMod Measure	Description of CalEEMod Measure
AQ – 1 Dust Prevention and Control	All ground-disturbing operations shall be suspended when winds exceed 20 miles per hour (mph), or when winds carry dust beyond the property line despite implementation of all feasible dust control measures.	Not applicable	Not applicable
AQ – 1 Dust Prevention and Control	Traffic and equipment speeds on all unpaved surfaces shall be reduced to 15 mph or less, and unnecessary vehicle traffic shall be reduced by restricting access.	C-11 Limit Vehicle Speeds on Unpaved Roads	The default reduction efficacy of 44% is for a 25 mile per hour speed limit.

EA/IS Measure	Description of EA/IS Measure	CalEEMod Measure	Description of CalEEMod Measure
AQ – 1 Dust Prevention and Control	Measures shall be implemented to reduce or eliminate carryout and trackout of fugitive dust or soil on construction vehicles, such as sweeping and picking up any trackout on adjacent public streets as needed.	C-12 Sweep Paved Roads	Sweep paved roads used by construction vehicle traffic to achieve dust suppression.
AQ – 2 Equipment Exhaust Minimization	All construction equipment shall be maintained in proper tune according to manufacturer's specifications.	Not applicable	Not applicable
AQ – 2 Equipment Exhaust Minimization	Unnecessary vehicle idling shall be restricted to five minutes or less.	C-2 Limit Heavy-Duty Diesel Vehicle Idling	This measure limits heavy-duty vehicle idling beyond current regulatory restrictions (13 CCR Section 2485) with some exceptions to the regulation, such as positioning or providing a power source for equipment or operations, such as lift, crane, pump, drill, hoist, or other auxiliary equipment.

EA/IS Measure	Description of EA/IS Measure	CalEEMod Measure	Description of CalEEMod Measure
AQ – 2 Equipment Exhaust Minimization	To the extent practicable, the use of diesel construction equipment meeting current California Air Resources Board (CARB) certification standards for off-road heavy-duty diesel engines shall be maximized.	Not applicable	Not applicable
AQ – 2 Equipment Exhaust Minimization	Visible emissions from stationary diesel-powered equipment shall not exceed 40-percent opacity for more than three minutes in any one hour.	Not applicable	Not applicable

1.4.2 Other Measures

No climate measures were applicable to the proposed project and therefore were not selected. No health and equity measures were applicable to the proposed project and therefore were not selected.

2.0 Results

Table 7 and Table 8 provide emissions estimates from the model results for selected criteria pollutants and GHG. A summary report of the model results is also provided at the end of this document. All emissions estimates are within acceptable Level A thresholds (see Table 1).

Table 7. Emissions estimates for criteria pollutants during construction for the proposed Reading Island Boat Ramp Improvement Project.

Period of Estimate	Unit of Measure	Estimated reactive organic gases (ROG) emissions	Estimated nitrogen oxide (NOx) emissions	Estimated particulate matter (PM10) emissions
Daily, Summer (Maximum)	pounds per day (lbs/day)	3.13	24.7	11.0
Average Daily (Maximum)	lbs/day	0.07	0.72	0.27
Annual (Maximum)	tons/year	0.01	0.13	0.05

Table 8. Emissions estimates for GHG during construction for the proposed Reading Island Boat Ramp Improvement Project.

Period of Estimate	Unit of Measure	Estimated carbon dioxide equivalent (CO₂e) emissions
Daily, Summer (Max)	pounds per day (lbs/day)	10,440
Average Daily (Max)	lbs/day	247
Annual (Max)	metric tons per year (MT/year)	40.83

3.0 Literature Cited

U.S. Bureau of Land Management and Western Shasta Resource Conservation District. November 2024 Administrative Draft Environmental Assessment/Initial Study for the Reading Island Boat Ramp Improvement Project. DOI-BLM-CA-N060-2024-0012-EA.