Memorandum

Making Conservation a California Way of Life.

To: Rachelle Estrada
Environmental Coordinator
California Department of Transportation

Date: ~~January 13, 2023~~
Revised February 15, 2023

File: 01-MEN-1
PM: 42.9/43.6
EA: 01-40141
EFIS: 0120000111

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Subject: **Revised Air Quality and Noise Analysis for the Salmon Creek Lead Abatement Project**

Introduction

Caltrans District 1 proposes a lead abatement project in Mendocino County between post miles 42.9 and 43.6, encompassing the Salmon Creek Bridge and the surrounding area. Lead concentrations in soil were found to exceed regulatory thresholds due to the bridge paint sandblast waste. Targeted removal is the recommended remediation strategy. Remediation would include excavation of shallow lead-impacted soil within the State ROW and private parcels east of the State ROW. Removal of vegetation would be necessary prior to removal of lead-impacted soils. Restoration of areas where lead-impacted soils are removed will occur. As part of the remediation, excavations are planned at existing guardrail north and south of the bridge. As a result, guardrail at all four bridge corners would be upgraded to current standards. There would be 90 to 120 feet of new guardrail at each location, including a concrete barrier transition, Midwest Guardrail System elements, and an approved end treatment. Concrete vegetation control would also be placed at all new guardrail per Caltrans standards.

The project is needed because historic bridge painting practices resulted in elevated lead concentrations in shallow soils beneath and east of the Salmon Creek Bridge. The purpose of the project is to remediate lead-impacted shallow soil in the State ROW and on the privately owned parcels east of the Salmon Creek Bridge

This study was revised on February 15, 2023, to include additional detail on construction emission and construction noise levels. This study supersedes the previous study dated January 13, 2023.

Air Quality

Transportation Conformity

Mendocino County is categorized as an attainment/unclassified area for all current National Ambient Air Quality Standards (NAAQS). Therefore, transportation conformity requirements do not apply.

Long-Term Effects (Operational Emissions)

This project would not change traffic volume, fleet mix, speed, or any other factor that would cause an increase in emissions relative to the no build alternative; therefore, this project would not cause an increase in operational emissions.

No minimization measures are recommended for operational emissions.

Short-Term Effects (Construction Emissions)

During construction, short-term degradation of air quality may occur due to the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and other construction-related activities. Emissions from construction equipment also are expected and would include carbon monoxide (CO), nitrogen oxides (NO_x), volatile organic compounds (VOCs), directly-emitted particulate matter (PM_{10} and $PM_{2.5}$), and toxic air contaminants such as diesel exhaust particulate matter. Construction activities are expected to increase traffic congestion in the area, resulting in increases in emissions from traffic during the delays. These emissions would be temporary and limited to the immediate area surrounding the construction site.

Fugitive dust would be generated during grading and construction operations. Sources of fugitive dust include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site may deposit mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} emissions may vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operating. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

The 2021 Caltrans Construction Emissions Tool (CAL-CET2021) version 1.0.2 was used to estimate average daily emissions for reactive organic gases (ROG), CO, NO_x, PM_{10} and $PM_{2.5}$. The lead abatement project is expected to take approximately 90 working days. Transporting lead contaminated soils to an approved disposal facility is expected to take 60 working days. The distance to an approved disposal facility is expected to be 350 miles from the Salmon Creek Bridge

and there would be approximately 440 trips. Table 1 summarizes estimated average daily emissions for each construction phase.

Table 1. Average Daily Construction Emissions per Phase

Project Phase	ROG (lbs/day)	NO_x (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
Land Clearing/Grubbing	3.555	20.035	51.553	6.530
Roadway Excavation	1.370	8.976	6.228	1.249
Base/Subbase/Import Borrow	1.953	13.050	17.623	2.701
Paving	2.036	14.473	1.088	1.072
Drainage/Environmental/Landscaping	4.156	22.151	1.721	1.690
Traffic Signalization/Signage/ Painting	0.547	3.769	0.245	0.240
Transport Material to Disposal Facility	1.052	17.591	4.828	1.106
Total Average Daily Emissions[1]	**4.156**	**22.151**	**51.553**	**6.530**

[1] Material transport phase may overlap with another phase. The total average daily emissions include on road transport of material and project phase with the highest average daily emissions. This represents the worst-case average daily emission rate.

Minimization Measures

Implementation of the following measures, some of which may also be required for other purposes such as storm water pollution control, will reduce air quality impacts resulting from construction activities. Please note that although these measures are anticipated to reduce construction-related emissions, these reductions cannot be quantified at this time.

- The construction contractor must comply with the Caltrans Standard Specifications in Section 14-9. Section 14-9.02 specifically requires compliance by the contractor with all applicable laws and regulations related to air quality, including the Mendocino County Air Quality Management District regulations and local ordinances.

- The construction contractor must comply with all Department of Toxic Substance Control's (DTSC's) rules and regulations, including the Remedial Action Plan (RAP), regarding exposure to fugitive dust emissions that contain airborne concentrations of lead.
- Water or a dust palliative will be applied to the site and equipment as often as necessary to control fugitive dust emissions.
- Construction equipment and vehicles will be properly tuned and maintained. All construction equipment will use low sulfur fuel as required by CA Code of Regulations Title 17, Section 93114.
- Equipment and materials storage sites will be located as far away from residential uses as practicable. Construction areas will be kept clean and orderly.
- Track-out reduction measures, such as gravel pads at project access points to minimize dust and mud deposits on roads affected by construction traffic, will be used.
- All transported loads of soils and wet materials will be covered before transport, or adequate freeboard (space from the top of the material to the top of the truck) will be provided to minimize emission of dust during transportation.
- Dust and mud that are deposited on paved, public roads due to construction activity and traffic will be promptly and regularly removed to reduce PM emissions.
- To the extent feasible, construction traffic will be scheduled and routed to reduce congestion and related air quality impacts caused by idling vehicles along local roads during peak travel times.

Greenhouse Gas (GHG)

Long-Term Effects (Operational Emissions)

The purpose of this project is to remediate lead-impacted shallow soil in the State ROW and on the privately owned parcels east of the Salmon Creek Bridge. The project would not increase capacity and would not change travel demands or traffic patterns when compared to the no-build alternative. Therefore, an increase in operational GHG is not anticipated.

Short-Term Effects (Construction Emissions)

Construction is expected to begin in 2026 and last approximately 90 working days. The proposed project would result in generation of short-term construction-related GHG emissions. Construction GHG emissions consist of emissions produced as a result of material processing, emissions produced by on-site construction equipment, and emissions arising from traffic delays

and detours due to construction. These emissions would be generated at different levels throughout the construction phase.

The CAL-CET2021 was used to estimate average carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbon-134a (HFC-134a) emissions from construction activities, while the CT-EMFAC2021 was used to estimate emissions from expected trucking activity created by the removal of the lead contaminated soil to the appropriate disposal facilities. Table 2 summarizes estimated GHG emissions generated by on-site equipment and trucking activity for the project. The total CO_2e produced during construction is estimated to be 463 metric tons.

Table 2. Estimates (US tons) of GHG Emissions during Construction

Construction Year	CO_2	CH_4	N_2O	BC	HFC-134a	CO_2e*
2026	484	0.007	0.051	0.011	0.004	510
Total	**484**	**0.007**	**0.051**	**0.011**	**0.004**	**510**

* A quantity of GHG is expressed as carbon dioxide equivalent (CO_2e) that can be estimated by the sum after multiplying each amount of CO_2, CH_4, N_2O, and HFC134a by its global warming potential (GWP). Each GWP of CO_2, CH_4, N_2O, BC, and HFC-134a is 1, 25, 298, 460, and 1,430, respectively.

Minimization Measures

- The construction contractor must comply with the Caltrans Standard Specifications in Section 14-9. Section 14-9.02 specifically requires compliance by the contractor with all applicable laws and regulations related to air quality, including the Mendocino County Air Quality Management District regulations and local ordinances.
- Compliance with Title 13 of the California Code of Regulations, which includes idling restrictions of construction vehicles and equipment to no more than 5 minutes.
- Caltrans Standard Specification 7-1.02C "Emissions Reduction" ensures that construction activities adhere to the most recent emissions reduction regulations mandated by the California Air Resource Board.
- Utilize a traffic management plan to minimize vehicle delays.
- To the extent feasible, construction traffic will be scheduled and routed to reduce congestion and related air quality impacts caused by idling vehicles along local roads during peak travel times.
- Maintain equipment in proper tune and working condition.

Energy

The National Environmental Policy Act (NEPA) (42 United States Code [USC] Part 4332) requires the identification of all potentially significant impacts to the environment, including energy impacts.

The California Environmental Quality Act (CEQA) Guidelines section 15126.2(b) and Appendix F, Energy Conservation, require an analysis of a project's energy use to determine if the project may result in significant environmental effects due to wasteful, inefficient, or unnecessary use of energy, or wasteful use of energy resources.

A project-level analysis of energy uses data to derive project energy consumption. Energy in a resource context generally pertains to the use or conservation of fossil fuels, which are a finite resource. Transportation energy is generally described in terms of direct and indirect energy, defined as follows:

Direct Energy (Mobile sources)

The proposed project would not increase capacity or provide congestion relief when compared to the no-build alternative. As such, it is unlikely to increase direct energy consumption from mobile sources.

Direct Energy (Construction)

The basic procedure for analyzing direct energy consumption from construction activities is to obtain fuel consumption projections in gallons from the 2021 Caltrans Construction Emissions Tool (CAL-CET2021). CAL-CET2021 outputs fuel consumption based on project-specific construction information. Furthermore, Caltrans Emissions Factor 2021 (CT-EMFAC2021) was utilized to estimate fuel consumption from the trucking activity that resulted from the disposal of lead contaminated soil to the appropriate disposal facilities. Table 3 summarizes estimates of the fuel consumption generated by operation for the project during the construction project.

Table 3. Construction Fuel Consumption

Construction Duration	Fuel Consumption (gallons)	
	Diesel Equipment	Gasoline Equipment
90 Working Days	37,762	6,543

Construction of the proposed project would primarily consume diesel and gasoline through operation of heavy-duty construction equipment, material deliveries, and debris hauling. As indicated above, energy use associated with proposed project construction is estimated to result in

the total short-term consumption of 37,762 gallons from diesel-powered equipment and 6,543 gallons from gasoline-powered equipment. This represents a small demand on local and regional fuel supplies that would be easily accommodated, and this demand would cease once construction is complete. Moreover, construction-related energy consumption would be temporary and not a permanent new source of energy demand, and demand for fuel would have no noticeable effect on peak or baseline demands for energy. Therefore, the project would not result in an inefficient, wasteful, and unnecessary consumption of energy.

Indirect Energy

The proposed project does not include maintenance activities which would result in long-term indirect energy consumption by equipment required to operate and maintain in the roadway. It will remediate lead-impacted shallow soil in the State ROW and on the privately owned parcels east of the Salmon Creek Bridge. As such, it is unlikely to increase indirect energy consumption though increased fuel usage.

Energy-Saving Measures

While construction would result in a short-term increase in energy use, construction design features would help conserve energy.

- Use recycled and energy-efficient building materials, energy-efficient tools and construction equipment, and renewable energy sources in construction and operation of the project.
- Improve operations and maintenance practices by regularly checking and maintaining equipment to ensure its functioning efficiently.
- Optimize start-up time, power-down time, and equipment sequencing.
- Educate employees about how their behaviors affect energy use.
- Ensure that team members are trained in the importance of energy management and basic energy-saving practices. Hold staff meetings on energy use, costs, objectives, and employee responsibilities.

Noise

Title 23, Part 772 of the Code of Federal Regulations (23CFR772) provides procedures for preparing operational and construction noise studies and evaluating noise abatement considered for Federal and Federal-aid highway projects. Under 23CFR772.7, projects are categorized as Type I, Type II, or Type III projects.

The Federal Highway Administration (FHWA) defines a Type I project as a proposed Federal or Federal-aid project for the construction of a highway on a new location; the physical alteration of an existing highway where there is either substantial horizontal or substantial vertical alteration; the addition of through lane; the addition of auxiliary lanes, except when the auxiliary lane is a turn lane; the addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange; restriping existing pavement for the purpose of adding through-traffic lane or an auxiliary lane; or the addition of a new or substantial alteration of a weight station, rest stop, ride-share lot, or toll plaza. A Type II project involves construction of noise abatement on an existing highway with no changes to highway capacity or alignment. A Type III project is a project that does not meet the classifications of a Type I or Type II project. Type III projects do not require a noise analysis.

23CFR772 defines substantial vertical alignment alteration as a project that removes shielding thereby exposing the line-of-sight between the receptor and the traffic noise source. This is done by altering either the vertical alignment of the highway or the topography between the highway traffic noise source and the receptor. 23CFR772 defines substantial horizontal alignment alteration as a project that halves the distance between the traffic noise source and the closest receptor between the existing condition to the future build condition.

Existing Noise Environment

This project is located in a rural part of Mendocino County. The project area is surrounded by a mix of residential and vacant agricultural land uses. Numerous residences are located along SR 1 near the project limits. The residences east and west of the project limits are located on bluffs above Salmon Creek and would be partially shielded when work is occurring below the bridge. Furthermore, the residences located in the canyon would be exposed to elevated noise levels during roadway construction operations. The duration of construction is expected to last 90 days, so the potential nuisance will be short-term, temporary, and transient.

Long-Term Effects (Operational Noise)

The proposed project does not construct a new highway in a new location or substantially change the vertical or horizontal alignments and does not include any other activities discussed in the definition of a Type I project. This project meets the criteria for a Type III project as defined in 23CFR772. Traffic volumes, composition and speeds would remain the same in the build and no build condition. Traffic noise impacts are not anticipated, and a detailed noise study report is not required.

Noise abatement was not considered on this project.

Short-Term Effects (Construction Noise)

During construction of the project, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction. Noise generated by construction activities would be a function of the noise levels generated by individual pieces of construction equipment, the type and amount of equipment operating at any given time, the timing and duration of construction activities, and the proximity of nearby sensitive receptors.

Construction noise would primarily result from the operation of heavy construction equipment and arrival and departure of heavy-duty trucks. Construction noise levels will vary on a day-to-day basis during each phase of construction depending on the specific task being completed. Table 4 summarizes maximum noise levels produced by construction equipment that is commonly used on roadway construction projects. Construction equipment is expected to generate noise levels ranging from 70 to 90 dBA at a distance of 50 feet, and noise produced by construction equipment would be reduced over distance at a rate of about 6 dB per doubling of distance. Topographic shielding and soft site acoustic spreading may provide additional reductions.

Table 4. Maximum Noise Levels from Construction Equipment

Equipment	Maximum Noise Level (dBA at 50 feet)
Bulldozers	85
Heavy Trucks	88
Pneumatic Tools	85
Backhoe	80
Dump Truck	84
Excavator	85

Source: Federal Transit Administration, 2006.
http://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm

FHWA's Roadway Construction Noise Model (RCNM) was used to calculate the maximum average noise levels anticipated during each phase of construction. RCNM includes representative sound levels for the most common types of construction equipment and the approximate usage factors that were developed based on an extensive database of information gathered during the construction of the Central Artery/Tunnel Project in Boston, Massachusetts (CA/T Project or "Big Dig"). The usage factors represent the percentage of time that the equipment would be operating at full power. Vehicles and equipment anticipated during each phase of construction were input into RCNM to calculate noise levels, including the maximum noise levels, from the different phases of construction. The maximum noise level assumes all

eqiupment are running at the same time. Table 5 summarizes maximum average noise levels at various distances from construction activity.

Table 5. Maximum Hourly Average Noise Levels

Distance from Construction Activity (ft)	Maximum Noise Level ($Leq_{[h]}$, dBA)
50	84.9
100	78.9
150	75.4
200	72.9
250	71.0

Minimization Measures

Noise associated with construction is controlled by Caltrans Standard Specification Section 14-8.02, "Noise Control," which states the following:

- Control and monitor noise resulting from work activities.
- Do not exceed 86 dBA L_{max} at 50 feet from the job site from 9 p.m. to 6 a.m.

In addition to the Standard Specifications, construction noise can be minimized through the following measures:

- Limit operation of pile driver, jackhammer, concrete saw, pneumatic tools, and demolition equipment to daytime hours.
- Unnecessary idling of internal combustion engines should be prohibited.
- Stationary equipment, such as compressors and generators, should be shielded and located as far away from residences as practical.
- Locate equipment and materials storage sites as far away from residential uses as practicable.

Groundborne Vibration and Groundborne Noise

The project is not expected to generate excessive groundborne vibration or groundborne noise. Vibration levels could be perceptible and cause disturbances at residences near the project area during operation of heavy equipment, such as vibratory rollers. However, these effects would be short-term and intermittent and would cease once construction is completed.

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