

November 7, 2022

Liane Randolph  
Chair  
Air Resources Board  
1001 I Street  
Sacramento, CA 95814

Comment submitted electronically via <https://ww2.arb.ca.gov/applications/public-comments>

RE: Proposed In-Use Locomotive Regulation

Dear Chair Randolph,

This letter sets forth Sierra Railroad Company's ("Sierra Railroad") company-specific comments concerning the California Air Resources Board's ("CARB") Proposed In-Use Locomotive Regulation (the "Proposed Regulation"). Sierra Railroad also supports the comments of the Association of American Railroads, the American Short Line and Regional Railroad Association, and the California Short Line Railroad Association (the "Railroad Association Comments") on the issue of federal preemption, and on all of the other issues addressed by the Railroad Association Comments. Sierra Railroad appreciates the opportunity to provide these company-specific comments to CARB.

#### Background and Summary

Sierra Railroad is a privately-owned company that owns and operates short line railroads. Its subsidiaries include Sierra Northern Railway and Mendocino Railway. Michael Hart, CEO of Sierra Railroad, has more than 25 years' experience forming and running environmentally friendly industrial companies. The U.S. Environmental Protection Agency named Mr. Hart an "Environmental Hero" for his work in biodiesel and the Obama White House named Mr. Hart a "Champion of Change" for his work in renewable energy. In the short line railroad industry, Sierra Railroad has been a leader, implementing both criteria and greenhouse gas (GHG) pollutant reducing technologies. Sierra Energy, which is also led by Mr. Hart, is a pioneer in developing and deploying waste-to-fuel technologies, and built and now operates a FastOx<sup>®</sup> gasifier unit that converts trash to diesel fuel or low carbon electricity at U.S. Army Garrison Fort Hunter Liggett, an Army training center east of Monterey, California.<sup>1</sup>

Even before CARB commenced this rulemaking, Sierra Railroad directly engaged with CARB staff and leadership in an effort to collaboratively develop and implement an industry-informed, cost-effective, and feasible strategy for reducing GHG and criteria pollutant emissions in the short line railroad industry. To this end, Sierra Railroad developed a detailed proposal in 2019 to upgrade its

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<sup>1</sup> See Peter Keating, "This Company Invented an Actual Magic Want to Turn Your Trash Into Clean Energy," May/June 2022 Issue of Inc. Magazine, at <https://www.inc.com/magazine/202205/peter-keating/sierra-energy-gasification-mike-hart.html>



pre-Tier 0 locomotives to Tier 3 and sought modest state funding and CARB support to execute this strategy (“Tier 3 Strategy”). While CARB called Sierra Railroad’s Tier 3 Strategy a great project and confirmed that it would provide criteria pollutant reductions for less than one-tenth the cost per ton compared to Tier 4 upgrades, CARB declined to fund the project specifically because of its use of Tier 3 locomotives. Since the advent of this rulemaking, CARB has similarly declined to integrate a cost-saving Tier 3 component into its Proposed Regulation. The details of the Tier 3 Strategy, its pollution reduction and air quality benefits, and its cost-effectiveness are fully described in Sierra Railroad’s December 23, 2020 comment letter, submitted during the workshop stage of this rulemaking, a copy of which is attached as **Exhibit 1** hereto and which is hereafter referenced as “Sierra’s Proposal.”

**CARB Failed to Adequately Address Sierra’s 2020 Proposal  
in its Initial Statement of Reasons**

CARB referenced and briefly analyzed “Sierra’s Proposal” and labeled it as “Alternative 4” in the Initial Statement of Reasons (“ISOR”),<sup>2</sup> For reference, the full text of CARB’s Alternative 4 discussion in the ISOR is attached as **Exhibit 2** hereto.

CARB’s summary rejection of Alternative 4 in its ISOR was legally inadequate in that CARB completely failed to address the core benefits of the Tier 3 Strategy in terms of delivering more rapid criteria pollutant reductions to California that would not only lead to corresponding health benefits in the most impacted communities but would also provide these reductions at a substantially lower cost per ton than the Proposed Regulation. CARB similarly failed to address the underlying quantitative emissions analysis contained in Sierra’s Proposal despite the fact the emissions analysis was developed by qualified engineers and prominently highlighted in the following text box that appeared in the first page of Sierra Railroad’s December 23, 2020 comment letter:

**Summary of Conclusion**

**Due to the benefit of early and complete fleet conversion, the Sierra Proposal outperforms the CARB Plan by achieving reductions of PM10 and NOx emissions in the 2020s that the CARB Plan cannot deliver until 2050. In one-third the timeframe and at one-tenth the cost, the Sierra Proposal is superior to the CARB Plan and should be the way forward for CARB and the State, serving as a model for the country as a whole.**

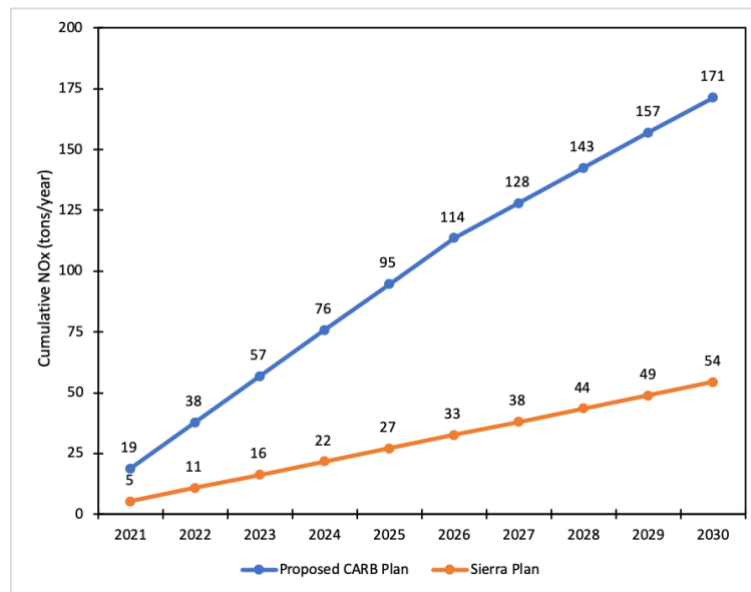
CARB’s failure to address the benefits of rapidly transitioning California’s short line railroad fleet from the predominantly pre-Tier 0 fleet that currently exists to an interim Tier 3 fleet, at minimal cost, shortchanges California’s communities by failing to capture immediately available and cost-effective emission reductions. Importantly, CARB’s ISOR does not dispute the empirical conclusions of any of the emissions analysis contained in the Sierra Proposal including the following passages that precisely describe and illustrate the dramatic reductions in criteria pollutants:

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<sup>2</sup> California Air Resources Board, “Staff Report: Initial Statement of Reasons, Public Hearing to Consider the Proposed In-Use Locomotive Regulation,” (September 20, 2022), at p. 212-213, available at <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/locomotive22/isor.pdf>

*“Due to its speed of implementation, Sierra’s Proposal enables significant near-term emission reductions of criteria pollutants compared to CARB’s Plan. With a modest level of funding support, Sierra would be able to immediately integrate 11 Tier 3 engines into its fleet in 2021, which will result NOx, ROG, and PM10 emission reductions in the 2020’s. Due to its necessarily delayed implementation, the CARB Plan will not “catch up” to the Sierra Proposal and deliver comparable reductions to California until 2050.*

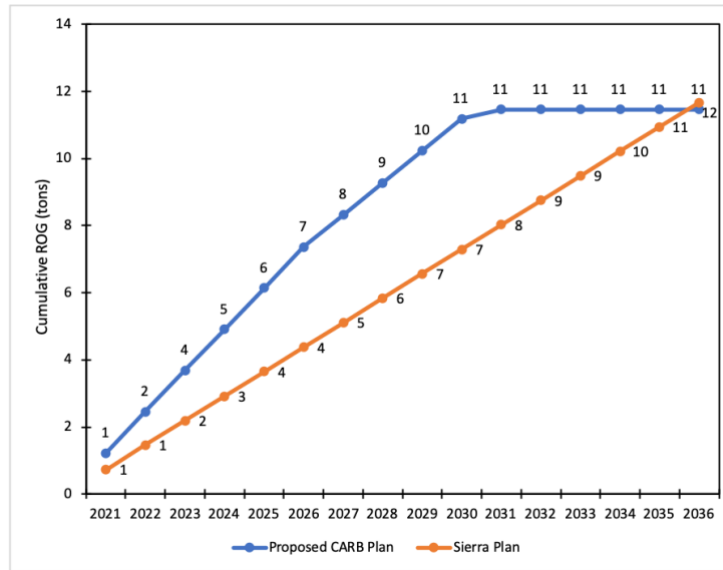
**NOx Scenario Analysis:** *The cumulative NOx emissions from the 11 Sierra locomotives analyzed in this case study are compared using the CARB Plan scenario vs. the Sierra Proposal scenario in Figure 1 below.*



**Figure 1. Cumulative NOx Emissions for CARB Plan vs. Sierra Proposal**

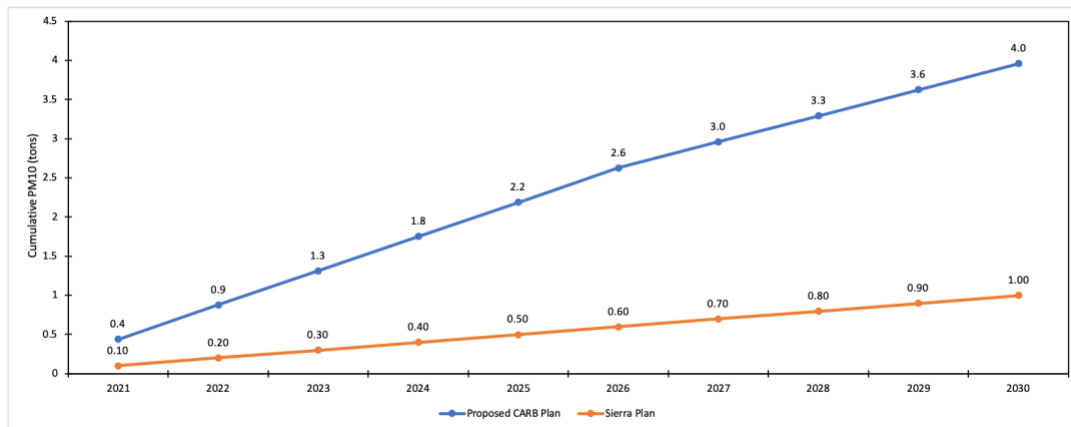
*Applying the CARB Plan scenario, if Sierra were to acquire 11 zero emission locomotives to replace its Pre-Tier 0 engines in 2031, the cumulative NOx emissions for the 11 locomotive fleet would remain steady at 170 tons after 2031. Under the Sierra Proposal, the 11 Tier 3 locomotives would not emit a cumulative 170 tons of NOx until 2051. Thus the near- and mid-term NOx reductions delivered by the Sierra’s Proposal outperform the CARB Plan in achieving the criteria pollutant emission reduction goals of the State.*

**ROG Scenario Analysis:** *While not as dramatically favorable as the NOx analysis, the Sierra Proposal also performs well in terms of delivering near-term ROG emission reductions. The Sierra Proposal scenario would result in a cumulative 11 tons of ROG emissions by the 11 locomotives by 2036. Using the CARB Plan scenario, Sierra would reach 11 tons of ROG emissions by 2030 then plateau. Therefore, the CARB Plan would not “catch up” and begin to reduce ROG emissions until 2036, whereas the Sierra Proposal would result in reduced cumulative ROG emissions for a fifteen-year period.*



***Figure 2. Cumulative ROG emissions of the CARB Plan and Sierra Proposal***

***PM10 Scenario Analysis:*** As was the case for NOx, the Sierra Proposal significantly outperforms the CARB Plan on particulate matter (“PM10”) reductions for decades. During the 2020’s, the CARB Plan would result in four tons of PM10 emissions compared to the single ton of PM 10 emissions under the Sierra Proposal. Even with complete fleet turnover to zero emission locomotives in 2031, the CARB Plan would not achieve parity with the Sierra Proposal until 2060 in terms of cumulative PM10 emissions.



***Figure 3. PM10 emissions of the CARB and Sierra plans from 2021 to 2030.***

***Cost Analysis:*** The Sierra Proposal would deliver substantial near-term NOx and PM10 reductions at a cost of \$300,000 per locomotive for a total replacement cost for 11 locomotives of \$3.3M. The CARB Plan would deliver NOx and PM10 reductions starting decades later at a cost of \$44M for the 11 locomotives.

### **The Sierra Proposal Offers Multiple Advantages Compared to CARB's Plan**

*CARB's Plan differs markedly from CARB's prior regulatory approaches to the railroad industry and also CARB's current approach to the trucking industry.<sup>3</sup> CARB does not propose to offer railroads any assistance, either through the CMP or any similar programs. CARB's mandatory savings accounts are instead funded entirely by the small-margin businesses being targeted. Due to the extremely high cost of replacing a single locomotive in an industry dominated by Pre-Tier 0 locomotives, CARB's mandatory savings accounts will achieve very minimal fleet turnover even if successfully implemented. This incremental fleet turnover will persist until 2030, when CARB's imposition of a useful life "command and control" measure will likely force most or all of the State's short line railroads out of business altogether, effectively picking a winner in freight transport. CARB may indeed be anticipating this outcome, as is suggested by the Draft Truck vs. Train Emissions Analysis that CARB has released.<sup>4</sup>*

*In comparison, Sierra's Proposal:*

- *Leverages one part of CARB's Plan to create a reliable supply of Tier 3 locomotives as Class 1 railroads upgrade their own locomotive stock.*
- *Involves a transaction between Class 1 and Class 3 railroads, supported by CMP funds, creating an incentive, rather than a tax, for Class 3 railroads to upgrade their locomotive fleets.*
- *Facilitates faster fleet turnover, while immediately, beginning this coming year, reducing California's short line locomotive PM<sub>10</sub> emissions by 75% and NO<sub>x</sub> emissions by 62% compared to Pre-Tier 0.*
- *Provides emission reductions that are an order of magnitude more cost-effective than under CARB's Plan.*
- *Recognizes that because short line railroads travel relatively short distances, massive locomotive investments are not economically feasible.*
- *Protects California's environment and economy."*

### **The Rapid Implementation of a Tier 3 Strategy, Followed by a Complete Transition to Zero-Emission Locomotives, is the Winning Strategy For Californians and California's Short Line Railroad Industry**

As noted above, Alternative 4 in the ISOR was derived solely from Sierra's Proposal, a proposal developed three months before CARB held its In-Use Locomotive Regulation Workshop and released its Draft Regulatory Language.<sup>5</sup> Given that CARB has now proposed specific regulatory language and advanced its Proposed Regulation to the formal rulemaking stage, Sierra Railroad is providing formal comments that describe a feasible regulatory alternative that integrates the Tier 3 Strategy into

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<sup>3</sup> See e.g., CARB, Proposed Fiscal Year 2020-2021 Funding Plan for Clean Transportation Incentives, Clean Truck and Bus Vouchers (HVIP), at 19-30 proposing an allocation of \$25M for clean truck and bus vouchers, available at [https://ww2.arb.ca.gov/sites/default/files/2020-11/proposed\\_fy2020-21\\_fundingplan.pdf](https://ww2.arb.ca.gov/sites/default/files/2020-11/proposed_fy2020-21_fundingplan.pdf)

<sup>4</sup> CARB, Draft Truck vs. Train Emissions Analysis, <https://ww2.arb.ca.gov/resources/fact-sheets/draft-truck-vs-train-emissions-analysis>

<sup>5</sup> See California Air Resources Board, "Locomotives and Railyards: Meeting and Workshops," In-Use Locomotive Regulation Workshop and related materials including Draft Regulatory Language (meeting notice for March 30, 2021), at <https://ww2.arb.ca.gov/our-work/programs/reducing-rail-emissions-california/locomotives-and-railyards-meetings-workshops>



the regulatory structure established by the Proposed Regulation (“Alternative Proposal”). To establish the empirical benefits of the Alternative Proposal in the rulemaking record, Sierra Railroad has commissioned and is providing emissions analyses that demonstrate the criteria pollutant reduction, air quality improvement, and health effects benefits of the Alternative Proposal. While the analyses contained in Sierra’s Proposal was developed solely with reference to Sierra Railroad’s fleet, the following emission analyses are based on the entire California short line locomotive fleet.

#### Description of Alternative Proposal for Short Line Railroads

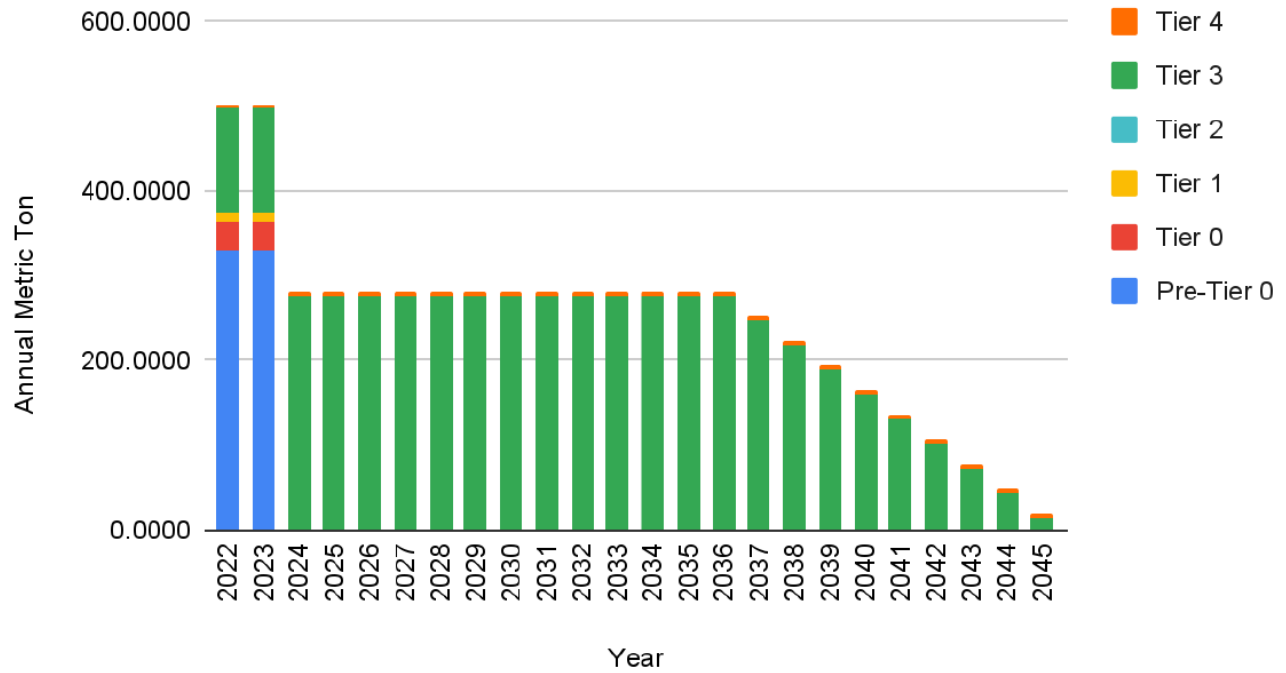
The following are the key components of Sierra Railroad’s Alternative Proposal:

- Require that Class III railroads upgrade to Tier 3 or higher locomotives by January 1, 2024
- Eliminate the requirement for mandatory spending accounts for all Class III railroads that timely meet the Tier 3 requirement
- Establish sufficient state and federal funding to cover 85% of costs for upgrading Class III railroads from Tier 3 locomotives to Zero Emission Locomotives (“ZE Locomotives”)
- Set the Original Build Date for Tier 3 locomotives used by Class III railroads at January 1, 2013, two years prior to the effective date of Tier 4 specifications.
- Do not require fleet-wide locomotive conversions in a single year but instead require that the upgrading of Tier 3 locomotives to ZE Locomotives for Class III railroads occur at a minimal annual rate of 10% of a railroad’s Tier 3 fleet beginning 2036.

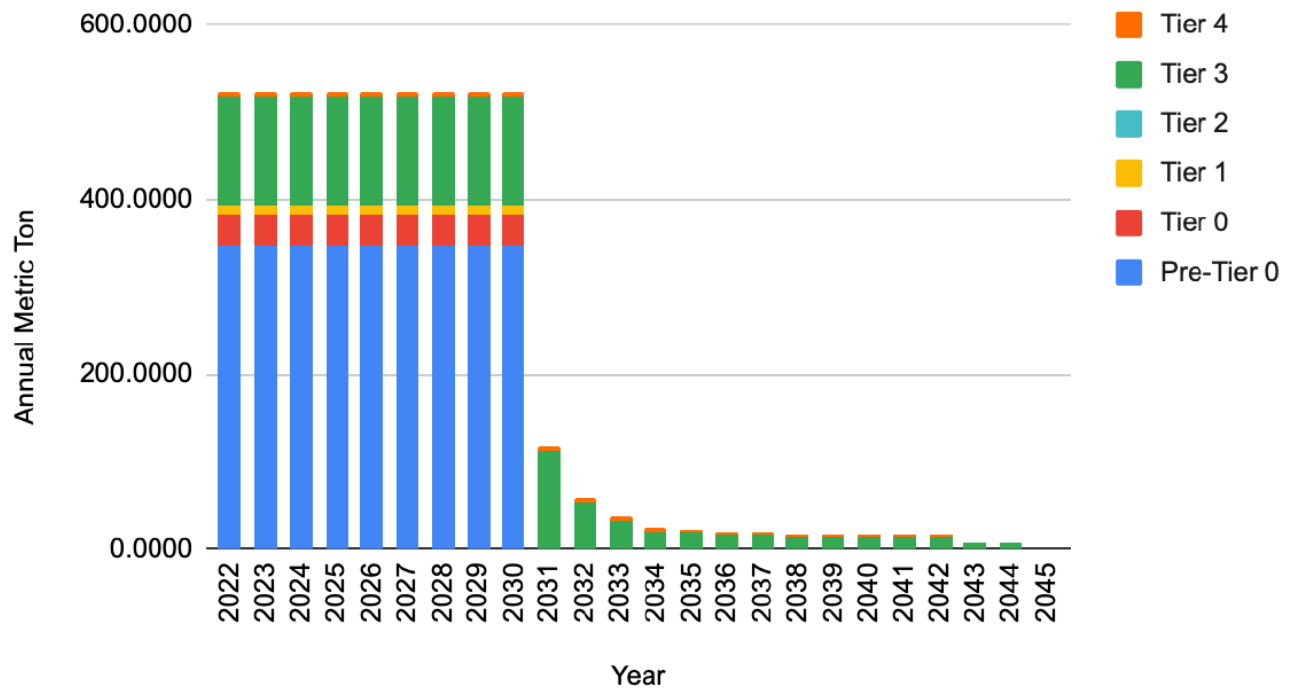


## Comparison of Alternative Proposal vs. Proposed Regulation RE: NOx and PM10

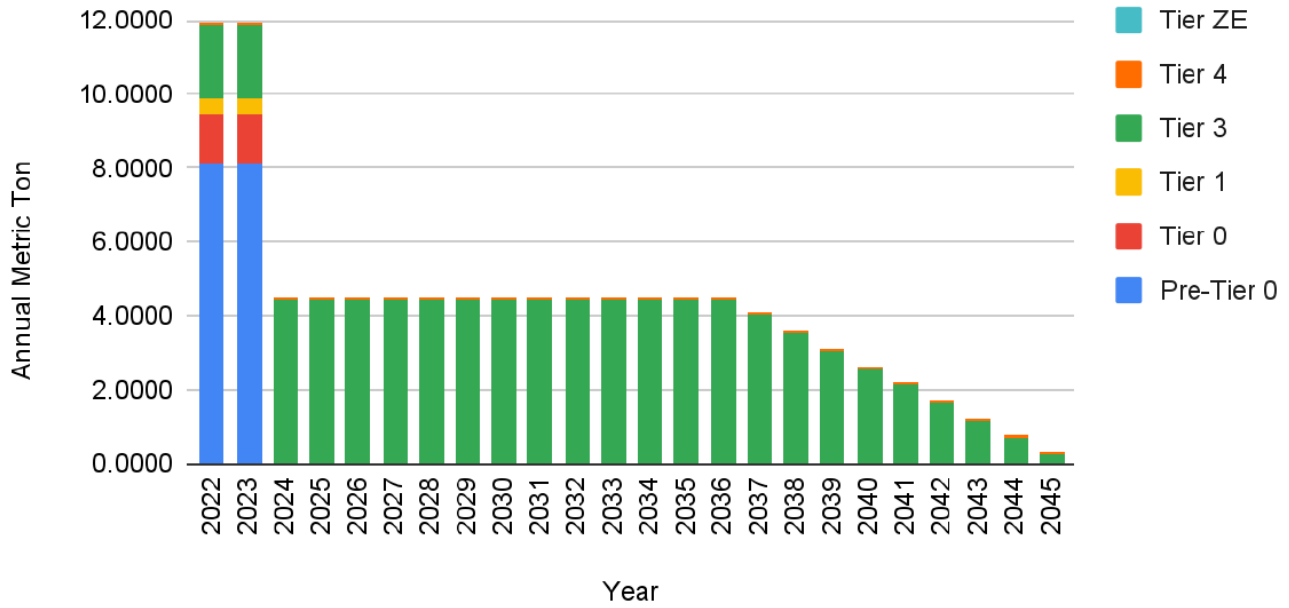
NOx- Alternative Proposal



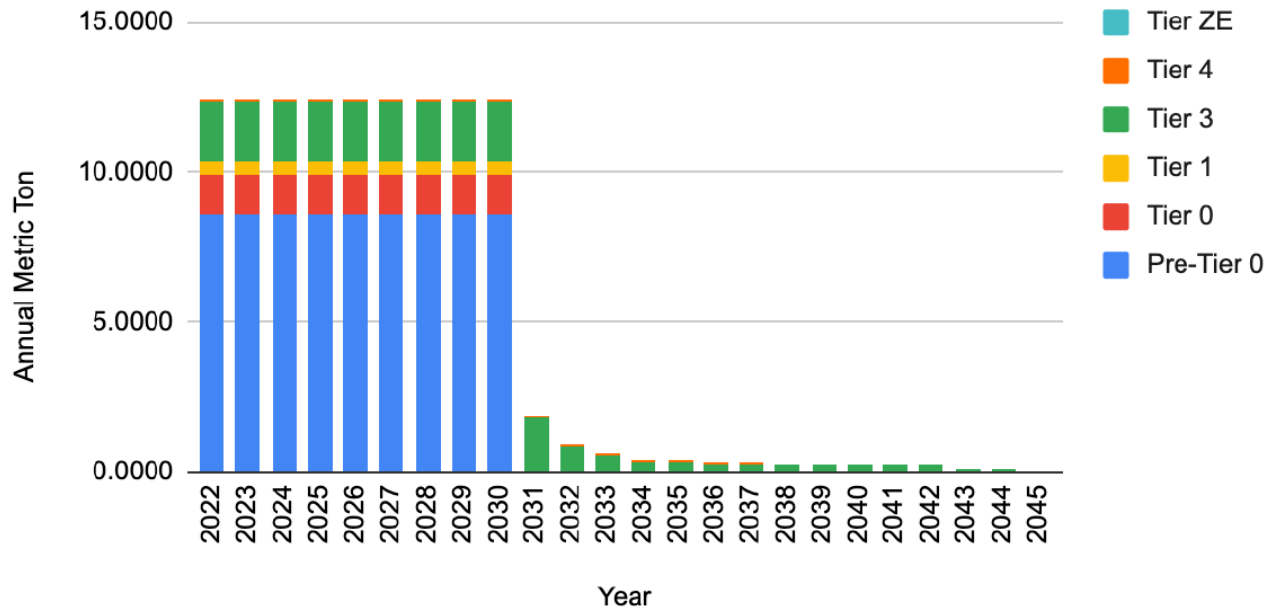
NOx- Proposed Regulation



## PM10- Alternative Proposal



## PM10- Proposed Regulation







## Conclusion

Even before CARB had announced its intentions to regulate the railroad industry, Sierra Railroad directly engaged with CARB staff and leadership to collaboratively develop and implement an industry-informed, cost-effective, and feasible strategy for reducing GHG and criteria pollutant emissions. Since the advent of the rulemaking, Sierra Railroad has consistently emphasized the importance of developing a cost-effective strategy to enable the California short line railroads to upgrade their locomotive fleets while continuing to provide vital services to the State and to local communities. Through its sustained engagement in this rulemaking process, Sierra Railroad continues to encourage CARB to enable the transition of California's short line railroad fleet in a feasible manner that is not limited to command-and-control measures but that also includes funding and incentives to the industry to facilitate the transition.

We appreciate the opportunity to submit these comments and remain available for additional engagement on these issues.

Best Regards,

A handwritten signature in blue ink, appearing to read 'Graham Noyes', is written over a faint, light blue circular background.

Graham Noyes

Cc: Michael Hart, Sierra Railroad Company

December 23, 2020

Richard Corey  
Executive Officer

Steve Cliff  
Deputy Executive Officer

Sydney Vergis  
Mobile Source Control Division Chief

Air Resources Board  
1001 I Street  
Sacramento, CA 95812

RE: Sierra Railroad Company's Comments Concerning the California Air Resources Board's Locomotive Regulatory Plans, including Sierra's Proposed Alternative Shortline Locomotive Emission Reduction Proposal

Dear Richard, Steve, and Sydney,

This letter sets forth Sierra Railroad Company's ("Sierra") comments concerning the California Air Resources Board's ("CARB") recently announced plan to reduce shortline locomotive emissions (the "Plan"). This letter also sets forth Sierra's proposal of an alternate concept (the "Proposal") which Sierra believes likely to provide greater criteria pollutant emission reductions – more quickly, at less cost, and with fewer obstacles to implementation – than CARB's Plan. The letter includes an 11 locomotive analysis comparing the Sierra Proposal with the CARB Plan. The analysis demonstrates that for this particular fleet of shortline locomotives the Sierra Proposal would achieve greater cumulative NOx and PM10 emission reductions than the CARB Plan through 2050 at less than one-tenth of the cost.

Please note that Sierra's comments are focused solely on California's shortline railroad industry and do not address other railroad sectors.

### **Summary of Conclusion**

**Due to the benefit of early and complete fleet conversion, the Sierra Proposal outperforms the CARB Plan by achieving reductions of PM10 and NOx emissions in the 2020s that the CARB Plan cannot deliver until 2050. In one-third the timeframe and at one-tenth the cost, the Sierra Proposal is superior to the CARB Plan and should be the way forward for CARB and the State, serving as a model for the country as a whole.**



## Overview

Michael Hart, Sierra's CEO, is a longstanding environmentalist with more than 25 years' experience forming and operating environmentally-friendly companies. These companies include Sierra Northern Railway, a shortline freight railroad; Mendocino Railway, a shortline freight and tourist railroad that, among other things, operates the world-famous Skunk Train; and Sierra Energy Corporation, a world leader in converting non-recyclable wastes into *carbon-negative* fuels for the railroad industry and others.

Though federal preemption and minimal federal locomotive emissions standards have granted the national railroad industry relative immunity from emissions regulation, Mr. Hart has nevertheless sought to make Sierra a leader in reducing railroad criteria-pollutants and GHG-pollutants through innovative clean-energy technologies and projects. In 2011 and 2012, Sierra Northern Railway secured funding via the San Joaquin Valley Air Pollution Control District's ("Valley Air District") Technology Advancement Program, and via an Environmental Protection Agency Target Air Shed Grant from the Sacramento Air Quality Management District, to repower two locomotives with Tier 4 engines. While this funding was much appreciated, each of the funding applications required almost a full year of work and the \$2 million cost of each Tier 4 engine meant that the number of fundable projects and the criteria- and GHG-pollutant reductions that could be achieved were very limited. Most recently, Mr. Hart's efforts led the California Energy Commission to issue a grant to Sierra, along with Shell, to construct and demonstrate a zero-emission hydrogen locomotive at the Port of West Sacramento.<sup>1</sup> As a result of his efforts, the United States Environmental Protection Agency ("EPA") named Mr. Hart an "Environmental Hero," and President Obama name him a "Champion of Change."

Mr. Hart continued to believe there had to be a better way to reduce locomotive emissions, and a method to do so on a larger scale. Mr. Hart discovered a better way in 2018 when he learned that Union Pacific Railroad ("UP"), a Class 1 railroad, was scrapping a large number of its Tier 3 locomotives as part of an upgrade to Tier 4 locomotives. Mr. Hart realized that the Tier 3 locomotives were still perfectly functional and, if transferred to shortlines, would reduce shortline PM<sub>10</sub> emissions by 75% and NO<sub>x</sub> emissions by 62% when compared with Pre-Tier 0 locomotives.<sup>2</sup>

Unfortunately, Mr. Hart discovered this opportunity at the last minute, after the Tier 3 locomotives had already begun to be scrapped. Without time to discuss this opportunity with CARB or local air districts before the locomotives were destroyed and the opportunity would be lost forever, Mr. Hart took the risk of purchasing 11 of UP's Tier 3 locomotives in the hope that he could work out an after-the-fact agreement with California's air quality officials, thereby preserving an all-too-rare opportunity to reduce locomotive criteria- and GHG-pollutants.

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<sup>1</sup> See GFO-20-604 - Hydrogen Fuel Cell Demonstrations in Rail and Marine Applications at Ports (H2RAM). The Sacramento Metropolitan Air Quality Management District has partnered in this effort, contributing \$500,000 to the project.

<sup>2</sup> These NO<sub>x</sub> and PM reductions are based on the information presented by CARB at the 2020 Locomotive Emissions Inventory Workshop, at slide 6 regarding the emission factors of the various Tiers. The presentation is available at <https://ww2.arb.ca.gov/sites/default/files/2020-09/CARBlocoinvwebinar2020.pdf> Note that these emission factors do not distinguish between switcher and line-haul locomotives, as do the more precise emission factors included in the Carl Moyer Program Guidelines and also referenced in this comment letter and Exhibit B.



While CARB has consistently praised the cost-effectiveness and emissions reduction potential of Sierra's Proposal, CARB has asserted that Mr. Hart's proactive approach in saving the locomotives from destruction before acquiring public funding approval precludes CARB funding support. CARB's position has confounded Sierra, not only because Sierra cannot without public assistance afford to keep and retrofit the locomotives for Class 3 use, meaning these environmentally-friendly locomotives will have to be scrapped, but also because Sierra's Proposal seems virtually identical to CARB's own concept presented during direct outreach to the railroad industry in December 2019, which would have enabled shortline railroads to reduce their emissions by acquiring retired Tier 3 locomotives from Class 1 railroads.<sup>3</sup> CARB's refusal to fund Sierra's Proposal is all the more confusing given that CARB's Air Quality Planning and Science Division predicted that long locomotive lifespans will result in no improvement in shortline emissions before at least 2050 at the locomotive emissions inventory workshop held on September 3, 2020.<sup>4</sup>

However, CARB seems to have abandoned its Tier 3 acquisition plan and to have shifted to a far more complicated Plan that would require California's railroads to contribute money to segregated accounts out of which the railroads would purchase Tier 4 and Tier 5 locomotives to replace their existing, less environmentally-friendly, locomotives. CARB's Plan has significant problems. First, courts have consistently found such state regulation of railroads to be federally preempted. Second, the Plan would burden railroads with a prohibitively expensive tax that is likely to bankrupt every California shortline, undermining or outright destroying the State's port and rail transportation systems while at the same time dramatically increasing truck emissions and putting immense pressure on California's aging road and bridge infrastructure.<sup>5</sup>

Another problem with CARB's Plan is its cost to value proposition. As CARB recognized in its October 30, 2020 Regulatory Plans Workshop, a single Tier 4 line-haul locomotive costs approximately \$3,000,000.<sup>6</sup> Even if a shortline could afford to purchase such an expensive locomotive every few years, it would take decades before any shortline could replace all its existing locomotives with Tier 4 locomotives. Sierra's Proposal, by comparison, would cost 90% less (about \$300,000 per Tier 3 upgrade) while still reducing shortline PM<sub>10</sub> emissions by 75% and NO<sub>x</sub> emissions by 62%, thereby providing a much faster path to improving California's air quality.

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<sup>3</sup> CARB and South Coast AQMD, "Plans to Reduce Emissions from Locomotives and Railyards, at slide 16, see [https://ww2.arb.ca.gov/sites/default/files/classic/railyard/docs/12092019\\_%20ADA%20Version%20to%20Post.pdf](https://ww2.arb.ca.gov/sites/default/files/classic/railyard/docs/12092019_%20ADA%20Version%20to%20Post.pdf)

<sup>4</sup> CARB, *2020 Locomotive Emissions Inventory*, Presentation for Public Workshop prepared by Air Quality Planning & Science Division (September 3, 2020), at <https://ww2.arb.ca.gov/sites/default/files/2020-09/CARBlocoinvwebinar2020.pdf>, slides 40 and 41.

<sup>5</sup> See attached Exhibit A, *Sierra Railroad's Response to Notice of Preparation of Draft Substitute Environmental Document, In-Use Locomotive Regulation*, dated November 25, 2020, to Rebecca Fancher of the California Environmental Quality Act ("CEQA") Unit. The Sierra response describes the potentially profound impacts of CARB's Plan on California's infrastructure and environment. See also CEQA Notice at [https://files.ceqanet.opr.ca.gov/265550-2/attachment/TwJkx8raCDhIpxY-t\\_2nYf9jcJG7ZG7b5PhqdwV6KYowMj0RlkK9iAFcn\\_0AyAbp9tCx5BvBCqTSOL0](https://files.ceqanet.opr.ca.gov/265550-2/attachment/TwJkx8raCDhIpxY-t_2nYf9jcJG7ZG7b5PhqdwV6KYowMj0RlkK9iAFcn_0AyAbp9tCx5BvBCqTSOL0).

<sup>6</sup> CARB, *Plans for In-Use Locomotive Regulation Workshop, Day 2* (October 30, 2020), slide 39 at <https://ww2.arb.ca.gov/sites/default/files/2020-12/2020.10.28%20841AM%20Workshop%20Slides%20Day%202%20-%20Remediated.pdf>



If CARB helped California shortlines fund locomotive upgrades in this manner, shortlines could afford to quickly upgrade their entire locomotive fleets, rather than upgrading just one locomotive every few years.

Because of the compelling emission reduction benefits and the minimal risks or obstacles to implementation presented by Sierra's Proposal, the remainder of this letter addresses that Proposal by specifically responding to CARB's objections, explaining why the Valley Air District has expressed qualified support for Sierra's Proposal, and reviewing CARB's findings concerning California's shortline emissions inventory. This letter also examines how CARB's own findings and technical analysis corroborate the value of Sierra's Proposal by presenting a case study that uses established CARB methodologies to compare the costs and benefits of CARB's Plan with those of Sierra's Proposal.

### **Sierra's Proposal**

As noted above, Mr. Hart learned in 2018 that UP was scrapping a fleet of Tier 3 locomotives. Mr. Hart realized those locomotives could be used to upgrade 11 of Sierra Northern Railway's Pre-Tier 0 locomotives, reducing shortline PM<sub>10</sub> emissions by 75% and NO<sub>x</sub> emissions by 62%, for approximately 10% of the cost to upgrade to Tier 4 locomotives. This immediately impactful locomotive emission reduction strategy would substantially decrease statewide criteria- and GHG-pollution at a drastically lower cost/ton than any other plan Mr. Hart was aware of. As UP had already begun scrapping its locomotives, Mr. Hart understood that all the locomotives would be destroyed before he could complete what was certain to be at least a yearlong process in seeking funding from CARB. Mr. Hart thus took the financial risk of buying the 11 locomotives on spec to preserve the opportunity. Since that time, Sierra has dedicated substantial internal and external resources in an effort to secure funding for its Proposal.

CARB staff, management, and Governing Board members have consistently praised the cost-effectiveness and attractiveness of Sierra's Proposal, as well as its potential to deliver immediate and substantial criteria pollutant reductions in one of the State's toughest industrial sectors. The latent value of Sierra's Proposal to the people of California is demonstrated by comparing the cost-effectiveness of its proposed 11-locomotive upgrade to a single Tier 4 locomotive upgrade using the Carl Moyer Program ("CMP") established methodology (as shown in Table 1 below).<sup>7</sup>

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<sup>7</sup> Roxana Bekemohammadi of Manticore Advocacy, LLC developed the calculations underlying this table. The first column is based on the specific information pertaining to Sierra's Proposal regarding fuel consumption and other CMP factors. These calculations have been discussed and reviewed with Ken Bhatti of the Air Resources Board, with each of the three involved air districts considered separately. On a per locomotive basis, the analysis yielded a cost-effectiveness figure of \$3,078 for Valley Air District, \$11,389 for Sacramento APCD, and \$4,071 for Mendocino APCD (see Exhibit B-1) based on an average fuel usage of 3,100 gallons/year. The Table 1 chart consolidates the entire Proposal involving 11 locomotives and compares it to a single Tier 4 upgrade. Note that the emission factors used by CARB and Ms. Bekemohammadi were based not on line-haul but on switcher locomotives. For comparison purposes, the line-haul emission factors have also been used to calculate cost-effectiveness (see Exhibit B-2) yielding similar results but this analysis has not been discussed and reviewed by CARB. Sierra is fully available to further engage with CARB on the relative cost-effectiveness of the Sierra Proposal.



Table 1

	Sierra Proposed	Tier 4 Locomotive Upgrade
Number of Locomotives	11	1 (San Joaquin)
Total Project Cost	\$3,850,000	\$2,850,000
Cost Effectiveness (dollars/weighted ton)	\$18,228.73	\$116,791.16
Max Funding (85% funding)	\$3,272,500	\$2,422,500
NOx Emission Reductions (tons/year)	13.50	1.44
ROG Emission Reductions (tons/year)	0.50	0.09
PM Emission Reductions (tons/year)	0.34	0.03

Because of the remarkably cost-effective reductions delivered by Sierra's Proposal, the Valley Air District (the San Joaquin Valley Air Pollution Control District where Sierra had planned to replace six of its Pre-Tier 0 locomotives with Tier 3 locomotives) has confirmed its willingness to work with Sierra, CARB, and the EPA to secure funding for Sierra's Proposal. Notably, Sierra's Proposal is just the first step Sierra has taken to upgrade its entire fleet to Tier 3 locomotives. In addition to the 11 locomotives at issue here, Sierra has secured another 13 Tier 3 locomotives that could be similarly deployed as future replacements, demonstrating the viability and scalability of the Proposal and the need for a dedicated and streamlined program that enables Class 3 railroads to take advantage of decommissioned Tier 3 locomotives designated for scrap as they become available in the market.

#### **CARB's Assessment of Sierra's Proposal's CMP Eligibility**

CARB has generously engaged in several discussions with Sierra as to Sierra's Proposal but has consistently concluded these discussions with statements such as, "It is a great proposal that would provide emission reductions far more cost-effectively than other locomotive proposals, but it is not eligible for CMP funding." CARB has given various reasons for this alleged ineligibility, and those reasons have generally referenced the fact that Sierra has already purchased the locomotives and asserted that CMP guidelines limit funding to Tier 4 locomotives.

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Ms. Bekemohammadi also developed the Tier 4 column which has previously been provided to CARB. The cost for the Tier 4 locomotive for modeling purposes was \$2,850,000, slightly lower than the \$3,000,000 cost CARB used as its Tier 4 estimate in its Regulatory Plans workshop. The fuel usage for the single Tier 4 was set based on the highest use locomotive in the Sierra fleet, with a fuel consumption of 17,785 gallons/year. Thus the Tier 4 cost-effectiveness analysis utilized the highest possible fuel consumption rate to improve the relative cost-effectiveness of the Tier 4. The cost-effectiveness of \$116,791 per weighted ton for Tier 4, is well in excess of the \$30,000/ton limit for locomotives established by CMP Guidelines.



While CARB’s firmly-established discretionary authority to approve CMP funding proposals on a case-by-case basis should overcome the above non-statutory eligibility issues,<sup>8</sup> the more serious eligibility issue CARB has raised pertains to whether the emission reductions provided by Sierra’s Proposal would be creditable under the California State Implementation Plan (“SIP-creditable”).<sup>9</sup> This issue has been framed in several ways, including whether the resulting reductions would be surplus or, more colloquially, whether these reductions would be “anyways” or “business as usual” reductions.

Sierra’s regulatory counsel on October 12, 2020 provided CARB’s Deputy Executive Officer Steve Cliff with a regulatory analysis examining the relevant legal standards for SIP creditability established by CMP Guidelines and California statutes.<sup>10</sup> This analysis also examined the EPA’s most-detailed legal analysis of SIP creditability (which addressed the Valley Air District’s Rule 9610 and California’s SIP). Sierra’s regulatory analysis concluded that Sierra’s Proposal meets all the standards for SIP-credibility established applicable EPA tests. CARB, unfortunately, has thus far declined to provide any substantive response to Sierra’s regulatory analysis. Mr. Cliff was unable to attend the meeting with Sierra’s regulatory counsel on October 12<sup>th</sup>, and CARB was instead represented by Division Chief Sydney Vergis. Ms. Vergis conceded that Sierra was proposing a great project but advised that she did not see any viable path forward for the project to receive funding.

Following this meeting, Sierra’s regulatory counsel and the Valley Air District’s incentives group (led up by Todd DeYoung, Director of Strategies and Incentives) further discussed Sierra’s Proposal and the SIP-credibility issue at a virtual meeting on November 3<sup>rd</sup>. Mr. DeYoung advised that the Valley Air District is enthusiastic about Sierra’s Proposal because it has the potential to provide criteria pollutant reductions at a level of cost-effectiveness **“that we don’t see very often and that is never available for locomotive proposals.”** Mr. DeYoung also made clear, however, that the Valley Air District would condition its support for Sierra’s Proposal on EPA preapproval of the Proposal’s SIP-credibility. Mr. DeYoung advised that, in practice, the EPA routinely denies SIP-credibility to projects that do not conform to CMP Guidelines.

Sierra is prepared to seek such EPA preapproval. However, Sierra believes that it would have a better chance of obtaining it if Sierra had CARB’s support for its Proposal, particularly if that support came as part of an overall blueprint for rapidly reducing GHG- and criteria-pollutant emissions in California’s railroad industry. Given that the incoming federal administration has stated its priority focus on criteria pollutant emission reductions and maintaining and creating American jobs and infrastructure, Sierra’s Proposal presents CARB with an opportunity to break

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<sup>8</sup> CARB, *The Carl Moyer Program Guidelines*, (2017 Revisions), Volume 1, Chapter 2 (General Criteria), at CC: “ARB may approve, on a case-by-case basis, projects that vary from the requirements of these Guidelines or do not meet all eligibility criteria in the Guidelines. Projects with case-by-case approvals must provide permanent, surplus, quantifiable, enforceable, cost-effective emission reduction benefits in California for the full contract term.(...)”

<sup>9</sup> The Valley Air District has qualified its support for Sierra’s Proposal by emphasizing the importance of obtaining EPA confirmation that upgrading Sierra’s locomotives to Tier 3 level would be SIP creditable before the project is funded.

<sup>10</sup> See attached Exhibit C, Noyes Law Corporation, *Regulatory Analysis of Surplus and State Implementation Plan Creditable Emissions under the Carl Moyer Program Statutes and Federal Law* (October 12, 2020).

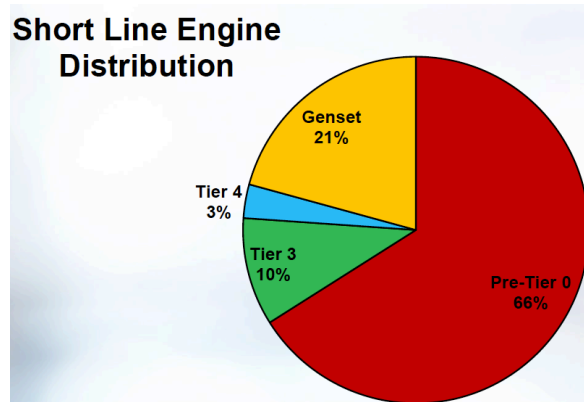
the federal logjam in reducing locomotive emissions that has existed since CARB filed its April 2017 “Petition for Rulemaking: Seeking Amendment of the Locomotive Emission Standards.”<sup>11</sup>

### **The Current Trajectory of Shortline Locomotive Emissions**

One of the most perplexing aspects of CARB’s skepticism toward Sierra’s Proposal is that it appears to run counter to CARB’s assessment of the future of shortline emissions in California. While CARB has not released any public report concerning its predictions as future locomotive emissions, CARB’s Air Quality Planning and Science Division addressed the State’s locomotive emissions inventory in a September 3, 2020 public workshop.<sup>12</sup> That workshop included the following acknowledgements concerning the nature of the shortline industry and locomotive upgrades:

- Regarding Growth: “Assumed to be constant- no available future plans.”
- Regarding Turnover:
  - “Assumed no turnover- companies do not make long-range business plans.”
  - “Average age is 43 years old.”
  - “(Engines have been bought, sold, leased over and over again).”<sup>13</sup>

That workshop also displayed California’s shortline locomotive engine tier distribution as follows:<sup>14</sup>



<sup>11</sup> CARB, Petition for EPA Rulemaking to Adopt More Stringent Emission Standards for Locomotives. See <https://ww2.arb.ca.gov/resources/documents/petition-rulemaking-seeking-amendment-locomotive-emission-standards>

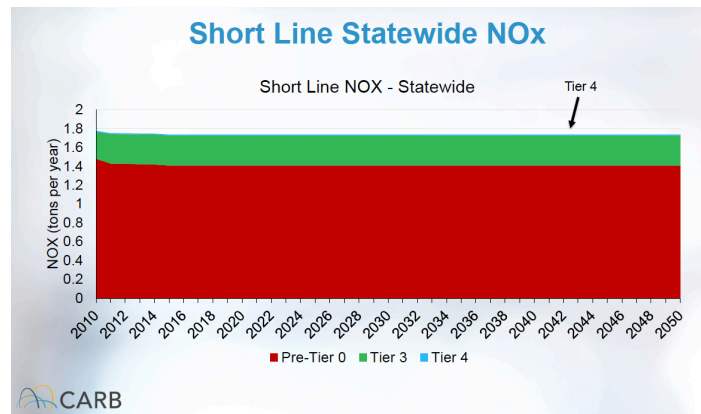
<sup>12</sup> The Workshop Presentation and Workshop Announcement for the September 2020 Public Workshop for Locomotive Emission Inventory are available at <https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/msei-meetings-workshops>.

<sup>13</sup> CARB Website, *2020 Locomotive Emissions Inventory*, Presentation for Public Workshop prepared by Air Quality Planning & Science Division (September 3, 2020), at <https://ww2.arb.ca.gov/sites/default/files/2020-09/CARBlocoinvwebinar2020.pdf>, slide 40.

<sup>14</sup> *Id.*, at slide 41.



Likely because of this, the workshop reported California’s shortline NO<sub>x</sub> emissions as almost completely static over the past 10 years, and predicted that NO<sub>x</sub> emissions would continue to remain static for at least 30 more years to come.<sup>15</sup>



Sierra believes that CARB correctly forecast that: (i) no Pre-Tier 0 locomotives are likely to be retired in California over the next 30 years and (ii) no existing locomotives are likely to be replaced with Tier 3 or Tier 4 locomotives. Sierra’s fleet of Pre-Tier 0 locomotives are of course included within the scope of CARB’s forecast. Sierra’s Proposal to retire 11 Pre-Tier 0 locomotives and to replace them with 11 Tier 3 locomotives would not constitute “business as usual” but would constitute surplus emission reductions that should properly be classified as SIP-creditable, especially given that if no governmental funding is found, these 11 Tier 3 locomotives will have to be scrapped.

### **CARB’s Locomotive Regulatory Plans**

On October 30, 2020, during a two-day workshop, CARB unveiled its locomotive regulation Plan, revealing that it planned to regulate locomotive emissions through a system of mandatory contributions, a *de facto* tax per locomotive coupled with a State mandate that all shortline companies first replace existing locomotives with Tier 4 locomotives (at an estimated cost of \$3,000,000 per locomotive), and then later with Tier 5 locomotives (a category that does not currently exist and at a price that will not be known until Tier 5’s are commercially available). CARB’s legal representative at the workshop, Rhead Enion, assured the workshop audience that CARB has the authority to enact such regulations, but declined to provide any legal authority for this position.

### **Federal Pre-Emption of State Regulatory Authority**

Federal pre-emption of railroad operations has rendered railroads largely immune from state environmental regulation. In fact, the Interstate Commerce Commission Termination Act (“ICCTA”) was passed specifically “with the purpose of expanding federal jurisdiction and

<sup>15</sup> *Id.*, at slide 42.



preemption of railroad regulation.”<sup>16</sup> This pre-emption generally provides the United States Surface Transportation Board (“STB”) with “exclusive” jurisdiction over “transportation by rail carriers.”<sup>17</sup> This jurisdiction is quite broad given that the ICCTA defines “transportation” to include any “property, facility, instrumentality, or equipment of any kind related to the movement of passengers or property, or both, by rail” as well as “services related to that movement.”<sup>18</sup> This broad jurisdiction of the STB has led to an extensive and consistent body of case law that holds that state environmental regulation of railroads is categorically pre-empted.<sup>19</sup> The reality of this federal pre-emption is why CARB’s locomotive criteria pollutant reduction goals require a market- and incentive-based solution, rather than a more “command and control” regulatory solution.

### **The Importance of Shortline Rail to California**

CARB’s Plan would have significantly adverse consequences for Sierra’s ability to remain in business, without providing correspondingly incremental and cost-efficient improvements to California’s air quality above those that could be achieved via Sierra’s Proposal. The impact on Sierra’s fleet is representative of the impact on California’s shortline industry as a whole. As illustrated by the attached California railroad map, shortline locomotives begin their journeys at a long-haul railroad termination juncture.<sup>20</sup> Shortlines deliver freight between this point and local businesses, both ways, connecting California businesses with the rest of the nation and the world (via ports).

Sierra’s three rail lines serves multiple California industries including food, chemicals, building products, animal feed, and transportation. For example, Sierra helps California farmers and producers export California rice and tomato products to locations throughout the US. Sierra also helps supply California’s mountain communities with propane, California’s dairy farmers with animal feed, and California’s construction industry with lumber, and other California businesses with needed chemicals, limestone, and plastics. In addition to the freight services it provides to California’s businesses, Sierra is also a key player in California’s tourism industry, attracting foreign and domestic tourists to its world-famous excursion, dinner, and special event trains in three separate tourist markets.

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<sup>16</sup> *Or. Coast Scenic R.R., LLC v. Or. Dep’t of State Lands*, 841 F.3d 1069, 1072 (9th Cir. 2016).

<sup>17</sup> 49 U.S.C. § 10501(b).

<sup>18</sup> *Id.*, § 10102(9); see also *Or. Coast Scenic R.R.*, 841 F.3d at 1073.

<sup>19</sup> *Friends of Eel River v. North Coast R.R.*, 399 P.2d 37, 60 (Cal. 2017) (holding that “state environmental permitting or preclearance regulation that would have the effect of halting a private railroad Proposal pending environmental compliance would be categorically preempted”); see also *North San Diego County Transit Dev. Bd.—Petition for Declaratory Order*, 2002 WL 1924265 (STB 2002) (holding that the Coastal Act was preempted by ICCTA as applied to rail Proposals).

<sup>20</sup> See Exhibit D, Association of American Railroads, *Freight Railroads in California*, (2017). See <https://www.aar.org/wp-content/uploads/2019/01/AAR-California-State-Fact-Sheet.pdf>



## **Case Study: CARB's Plan vs. Sierra's Proposal**

The following analysis reviews how CARB's Plan would apply to the 11 Pre-Tier 0 locomotives that would under Sierra's Proposal be upgraded to Tier 3 locomotives. This analysis is based on the travel-miles and fuel-use metrics set forth in Sierra's grant proposal to CARB. The locomotive tier emission factors and cost-effectiveness calculations used are CARB's own. Sierra's complete assumptions and calculations are described in the attached Exhibit B.

The CARB Regulatory Plans presented at the October 30, 2020, workshop included a "Spending Account Range Example." ("Spending Range")<sup>21</sup> The Spending Range for a Pre-Tier 0 locomotive is based on the annual use of the train measured in megawatt hours (MWhr) per year, and ranges from \$900-\$1,500. This analysis uses the midpoint of that Spending Range, \$1,200 per MWhr. Based on total historical fuel usage of 34,100 gallons per year, Sierra's 11 locomotives perform 426.25 MWhr of work per year.<sup>22</sup> Applying the \$1,200 per MWhr figure to the Sierra fleet would therefore result in a mandatory contribution of \$511,500, by Sierra to the spending account annually. Under the CARB Plan, Sierra would be required to begin contributing to its spending account in 2024 based on its Annual Activity Report for 2023. Based on CARB's cost assumption of \$4M for a Freight line-haul Tier 5 locomotive, Sierra would have enough in its spending account to purchase its first Tier 5 locomotive after eight years in 2032.<sup>23</sup>

According to CARB's Regulation Implementation Timeline, this pace of upgrades would be inadequate to address CARB's goals. CARB has proposed implementing a useful life limit in 2030, banning all locomotives below Tier 2.<sup>24</sup> Thus, after paying a total \$511,500 for seven years from 2024-2030, Sierra would have \$3,580,500 in its spending account. This would be sufficient for a single Tier 4 locomotive only after Sierra contributed an additional \$419,500. For the remainder of this fleet, Sierra would be faced with a sudden mandate to purchase ten Tier 4 locomotives, at a total cost of at least \$30,000,000, or ten Tier 5 locomotives, at a total cost of at least \$40,000,000. Yet these 11 locomotives constitute just a portion of Sierra's overall locomotive fleet. Sierra would have to find an additional \$45,000,000 to upgrade its additional 15 locomotives to Tier 4 or an additional \$60,000,000 to upgrade to Tier 5.

***The case study of upgrading 11 Pre-Tier 0 shortline locomotives to Tier 3 demonstrates that Sierra's Proposal outperforms the CARB Plan in delivering emission reductions to California.***

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<sup>21</sup> CARB, *Plans for In-Use Locomotive Regulation Workshop, Day 2* (October 30, 2020), slide 48 at <https://ww2.arb.ca.gov/sites/default/files/2020-12/2020.10.28%20841AM%20Workshop%20Slides%20Day%202%20-%20Remediated.pdf>

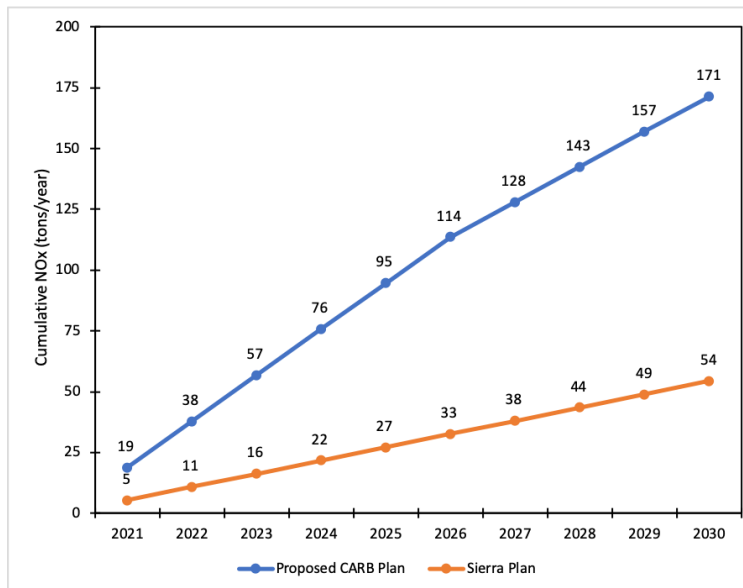
<sup>22</sup> The fuel usage is converted to MWhr equivalent by using a conversion factor of 0.0125 MWhr per gallon.

<sup>23</sup> CARB, *Plans for In-Use Locomotive Regulation Workshop, Day 2* (October 30, 2020), slide 39 at <https://ww2.arb.ca.gov/sites/default/files/2020-12/2020.10.28%20841AM%20Workshop%20Slides%20Day%202%20-%20Remediated.pdf>.

<sup>24</sup> *Id.*, at slide 55.

Due to its speed of implementation, Sierra's Proposal enables significant near-term emission reductions of criteria pollutants compared to CARB's Plan. With a modest level of funding support, Sierra would be able to immediately integrate 11 Tier 3 engines into its fleet in 2021, which will result NO<sub>x</sub>, ROG, and PM<sub>10</sub> emission reductions in the 2020's. Due to its necessarily delayed implementation, the CARB Plan will not "catch up" to the Sierra Proposal and deliver comparable reductions to California until 2050.

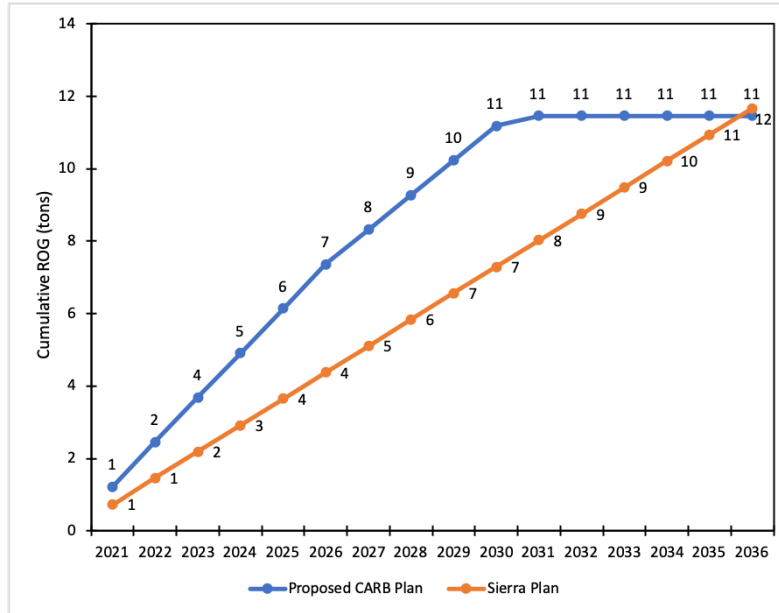
**NO<sub>x</sub> Scenario Analysis:** The cumulative NO<sub>x</sub> emissions from the 11 Sierra locomotives analyzed in this case study are compared using the CARB Plan scenario vs. the Sierra Proposal scenario in Figure 1 below.



**Figure 1. Cumulative NO<sub>x</sub> Emissions for CARB Plan vs. Sierra Proposal**

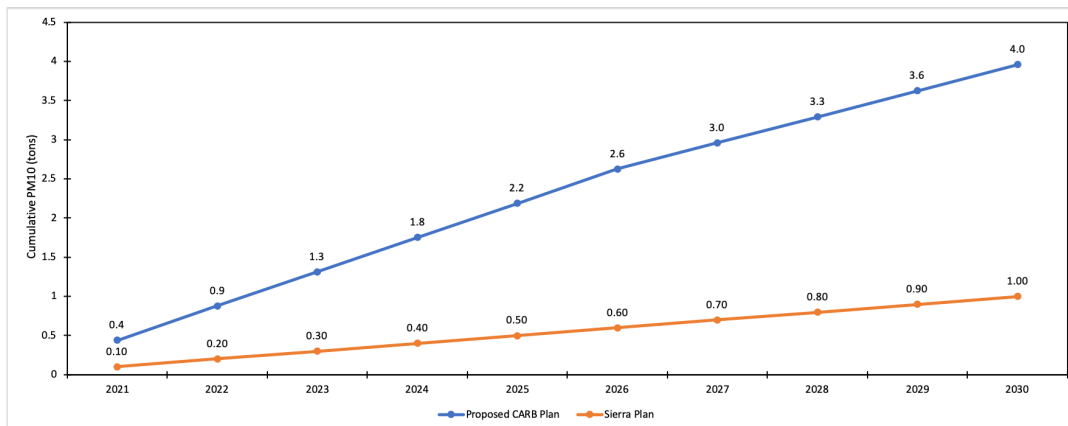
Applying the CARB Plan scenario, if Sierra were to acquire 11 zero emission locomotives to replace its Pre-Tier 0 engines in 2031, the cumulative NO<sub>x</sub> emissions for the 11 locomotive fleet would remain steady at 170 tons after 2031. Under the Sierra Proposal, the 11 Tier 3 locomotives would not emit a cumulative 170 tons of NO<sub>x</sub> until 2051. Thus the near- and mid-term NO<sub>x</sub> reductions delivered by the Sierra's Proposal outperform the CARB Plan in achieving the criteria pollutant emission reduction goals of the State.

**ROG Scenario Analysis:** While not as dramatically favorable as the NO<sub>x</sub> analysis, the Sierra Proposal also performs well in terms of delivering near-term ROG emission reductions. The Sierra Proposal scenario would result in a cumulative 11 tons of ROG emissions by the 11 locomotives by 2036. Using the CARB Plan scenario, Sierra would reach 11 tons of ROG emissions by 2030 then plateau. Therefore, the CARB Plan would not "catch up" and begin to reduce ROG emissions until 2036, whereas the Sierra Proposal would result in reduced cumulative ROG emissions for a fifteen-year period.



**Figure 2. Cumulative ROG emissions of the CARB Plan and Sierra Proposal**

**PM10 Scenario Analysis:** As was the case for NO<sub>x</sub>, the Sierra Proposal significantly outperforms the CARB Plan on particulate matter (“PM10”) reductions for decades. During the 2020’s, the CARB Plan would result in four tons of PM10 emissions compared to the single ton of PM 10 emissions under the Sierra Proposal. Even with complete fleet turnover to zero emission locomotives in 2031, the CARB Plan would not achieve parity with the Sierra Proposal until 2060 in terms of cumulative PM10 emissions.



**Figure 3. PM10 emissions of the CARB and Sierra plans from 2021 to 2030.**

**Cost Analysis:** The Sierra Proposal would deliver substantial near-term NO<sub>x</sub> and PM10 reductions at a cost of \$300,000 per locomotive for a total replacement cost for 11 locomotives of \$3.3M. The CARB Plan would deliver NO<sub>x</sub> and PM10 reductions starting decades later at a cost of \$44M for the 11 locomotives.



## **The Sierra Proposal Offers Multiple Advantages Compared to CARB's Plan**

CARB's Plan differs markedly from CARB's prior regulatory approaches to the railroad industry and also CARB's current approach to the trucking industry.<sup>25</sup> CARB does not propose to offer railroads any assistance, either through the CMP or any similar programs. CARB's mandatory savings accounts are instead funded entirely by the small-margin businesses being targeted. Due to the extremely high cost of replacing a single locomotive in an industry dominated by Pre-Tier 0 locomotives, CARB's mandatory savings accounts will achieve very minimal fleet turnover even if successfully implemented. This incremental fleet turnover will persist until 2030, when CARB's imposition of a useful life "command and control" measure will likely force most or all of the State's shortline railroads out of business altogether, effectively picking a winner in freight transport. CARB may indeed be anticipating this outcome, as is suggested by the Draft Truck vs. Train Emissions Analysis that CARB has released.<sup>26</sup>

In comparison, Sierra's Proposal:

- Leverages one part of CARB's Plan to create a reliable supply of Tier 3 locomotives as Class 1 railroads upgrade their own locomotive stock.
- Involves a transaction between Class 1 and Class 3 railroads, supported by CMP funds, creating an incentive, rather than a tax, for Class 3 railroads to upgrade their locomotive fleets.
- Facilitates faster fleet turnover, while immediately, beginning this coming year, reducing California's shortline locomotive PM<sub>10</sub> emissions by 75% and NO<sub>x</sub> emissions by 62% compared to Pre-Tier 0.
- Provides emission reductions that are an order of magnitude more cost-effective than under CARB's Plan.
- Recognizes that because shortline railroads travel relatively short distances, massive locomotive investments are not economically feasible.
- Protects California's environment and economy.

## **Conclusion**

Sierra shares CARB's goal of reducing locomotive emissions in California. In fact, this is a goal Sierra has worked toward for more than 25 years. But being a shortline railroad owner and operator, Sierra is deeply familiar with the problems facing shortlines, problems that include small profit-margins that do not allow for expensive equipment upgrades, especially when their existing equipment has a functional life that spans many more decades.

Sierra believes its Proposal will accomplish all of CARB's goals in a much faster and more effective manner than the CARB Plan. Even CARB appears to have understood this given that CARB's concept in 2019 of replacing pre-Tier 0's with Tier 3 locomotives made available when

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<sup>25</sup> See e.g. CARB, Proposed Fiscal Year 2020-2021 Funding Plan for Clean Transportation Incentives, Clean Truck and Bus Vouchers (HVIP), at 19-30 proposing an allocation of \$25M for clean truck and bus vouchers, available at [https://ww2.arb.ca.gov/sites/default/files/2020-11/proposed\\_fy2020-21\\_fundingplan.pdf](https://ww2.arb.ca.gov/sites/default/files/2020-11/proposed_fy2020-21_fundingplan.pdf)

<sup>26</sup> CARB, Draft Truck vs. Train Emissions Analysis, <https://ww2.arb.ca.gov/resources/fact-sheets/draft-truck-vs-train-emissions-analysis>



Class 1 locomotives were upgraded was virtually identical to the Sierra Proposal. Sierra thus respectfully requests that CARB take a fresh look at the benefits provided by the Sierra Proposal (and CARB's former regulatory concept) as well as the problems that would likely be created under CARB's current Plan. These serious problems include a risk that the CARB plan will be found to be federally preempted after years of litigation, thereby costing California years of air quality improvement; and a risk of eradicating the shortline industry and causing an array of unintended environmental and economic consequences as further discussed in Sierra's CEQA letter.<sup>27</sup>

Regardless of CARB's future plans, Sierra asks CARB to support Sierra's effort to obtain EPA approval of the Sierra Proposal, allowing Sierra in the interim to replace 11 of its Pre-Tier 0 locomotives with Tier 3 locomotives that will, as to each upgraded locomotive, immediately reduce Sierra's PM<sub>10</sub> emissions by 75% and its NO<sub>x</sub> emissions by 62%, greatly improving California's air quality. Sierra cannot conceive of a better "win-win" for Sierra, CARB, and the people of this State. Nor can Sierra conceive of a worse "lose-lose" than forcing Sierra to send these cleaner-burning locomotives to be scrapped simply because Sierra lacks the financial ability to keep them without government help.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Graham Noyes', is positioned below the 'Sincerely,' text.

Graham Noyes

Cc: Michael Hart, Sierra Railroad Company

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<sup>27</sup> See Exhibit A, Sierra Railroad, Response to Notice of Preparation of Draft Substitute Environmental Document, In-Use Locomotive Regulation, dated November 25, 2020, to Rebecca Fancher of the CEQA Unit. CEQA Notice at [https://files.ceqanet.opr.ca.gov/265550-2/attachment/TwJkx8raCDhIpxY-t\\_2nYf9jcJG7ZG7b5PhqdwrV6KYowMj0RlkK9iAFcn\\_0AyAbp9tCx5BvBCqTSOL0](https://files.ceqanet.opr.ca.gov/265550-2/attachment/TwJkx8raCDhIpxY-t_2nYf9jcJG7ZG7b5PhqdwrV6KYowMj0RlkK9iAFcn_0AyAbp9tCx5BvBCqTSOL0)



November 25, 2020

Rebecca Fancher  
California Environmental Quality Act Unit  
Air Resources Board  
1001 I Street  
Sacramento, CA 95812  
Via email to [ceqa.unit@arb.ca.gov](mailto:ceqa.unit@arb.ca.gov)

RE: Sierra Railroad's Response to Notice of Preparation of Draft Substitute Environmental Document, In-Use Locomotive Regulation

Dear Ms. Fancher,

This letter responds to the Notice of Preparation relating to the proposed In-Use Locomotive Regulation ("NOP") and is submitted on behalf of Sierra Railroad Company ("Sierra Railroad"). Sierra Railroad owns and operates shortline freight and tourist railroads. Its subsidiaries include Sierra Northern Railway (a freight railroad) and Mendocino Railway (a tourist railroad which operates the Skunk Train and the Sacramento River Fox Train).

At the outset, Sierra Railroad would encourage the California Air Resources Board ("CARB") to rescind the NOP, engage with the railroad industry regarding feasible means to achieve CARB's air quality objectives, and develop a viable emission reduction proposal. Based on extensive precedent establishing federal preemption in the railroad sector, the proposed In-Use Locomotive Regulation ("Proposed Regulation") appears to be a federally proscribed regulatory action. Assuming that CARB is successful in overcoming this precedent in court, the Proposed Regulation would bankrupt California's shortline railroad ("Class 3") industry, substantially disrupt California's line-haul railroad ("Class 1") industry, place tens of thousands of additional trucks on California's roads and in California's ports and railyards, and eliminate thousands of California jobs. In the public workshop, CARB estimated the cost for locomotive replacement to Tier 4 level to be \$3,000,000 per locomotive.<sup>1</sup> Sierra Railroad's fleet includes 14 Pre-Tier 0 locomotives. The Proposed Regulation would therefore impose a \$42,000,000 compliance obligation on the company. As is the case for most small companies, such a substantial expense would force Sierra Railroad and its subsidiaries out of business.

Specific to the shortline railroad industry, Sierra Railroad anticipates that constructive engagement with the industry would enable CARB to recognize the benefit of upgrading the current Class 3 locomotive inventory from the current predominance of Pre-Tier 0 locomotives to Tier 3 locomotives over a scheduled period. According to CARB's 2020 Locomotive Emissions Inventory, 66% of California's shortline locomotive inventory are Pre-Tier 0 locomotives.<sup>2</sup> Upgrading these

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<sup>1</sup> CARB Concepts for In-Use Locomotive Regulation Workshop, Day 2 (October 30), presentation at slide 39, <https://ww2.arb.ca.gov/sites/default/files/2020-11/2020.10.28%20841AM%20Workshop%20Slides%20Day%202%20-%20Remediated.pdf>

<sup>2</sup> CARB Air Quality Planning and Science Division, 2020 Locomotive Emissions Inventory Public Workshop (September 3, 2020), presentation at slide 41, at <https://ww2.arb.ca.gov/sites/default/files/2020-09/CARBlocoinvwebinar2020.pdf>





locomotives to Tier 3 provides a 75% PM10 reduction and a 62% NO<sub>x</sub> reduction at a cost of approximately \$300,000 per locomotive, a tenth of CARB's estimated \$3,000,000 per locomotive cost to upgrade to a Tier 4 locomotive. While the additional \$2,700,000 in expenditures would yield 30% more NO<sub>x</sub> reduction and 20% more PM10 reduction, this extremely expensive air quality benefit is insufficient to offset the adverse air quality and other environmental impacts of massively increasing truck traffic within the State, expanding and repairing California's road system to handle that additional truck traffic, increasing truck congestion at California ports and railyards, closing shortline railyards, diverting port traffic away from California, and suffering a myriad of other negative environmental consequences that would be triggered by the Proposed Regulation.

Due to the massively detrimental and irreversible environmental impacts that are the foreseeable results of the Proposed Regulation, Sierra Railroad objects to CARB's proposed preparation of an Environmental Analysis as legally inadequate under CEQA. The foreseeable result of the Proposed Regulation is that it will fundamentally alter the patterns of freight and truck transport in the western United States, with the potential to divert global shipping away from California's ports. The Proposed Regulation therefore requires the development of a comprehensive environmental impact report under CEQA. In addition, given the dominant role of the federal government in regulating the railroad industry and railyards, the Proposed Regulation also triggers compliance obligations under the National Environmental Policy Act.

### **Tier 3 Replacement Provides a Reasonable Alternative**

Upgrading California's short-line railroad industry to Tier 3 locomotives utilizing state incentive funds such as the Carl Moyer program is a reasonable alternative under CEQA. CARB has thus far declined to consider this alternative despite Sierra Railroad's extensive engagement with the agency on this issue. While the full details of Sierra Railroad's recommendations to CARB are outside the scope of this response to the NOP, the following summary demonstrates that replacement of Pre-Tier 0 locomotives with Tier 3 locomotives is a feasible, reasonable, highly environmentally beneficial, and far less burdensome alternative than the Proposed Regulation.

Michael Hart, CEO of Sierra Railroad, is a longstanding environmentalist who has more than 25 years of experience forming and operating environmentally-friendly industrial companies. Mr. Hart has made Sierra Railroad a leader in reducing both criteria-pollutants and GHG-pollutants through innovative clean-energy technologies, including the development and deployment of waste-to-fuel technologies such as Sierra Energy Corporation, another company owned by Sierra Railroad that is a world leader in converting non-recyclable wastes into *carbon-negative* fuels for use in the railroad industry and elsewhere. Mr. Hart's environmental efforts have not only earned him an "Environmental Hero" award from the United States Environmental Protection Agency ("EPA") but resulted in President Obama naming him a "Champion of Change."

In 2018, Mr. Hart discovered a cost-effective and scalable method to reduce criteria-pollutant and GHG-pollutants from California's shortline rail industry. He found that there are occasional windows of opportunity to purchase used Tier 3 locomotives from Class 1 railroads like UP and BNSF when those long-haul railroads upgrade to Tier 4 locomotives and retire their Tier 3 locomotives from service. In these situations, Tier 3 locomotives can be purchased at a relative bargain because:

- the locomotives take up track space and quickly become a nuisance;
- there is a limited used-locomotive market with few buyers;
- there is no regulatory requirement for shortlines to replace their aging pre-Tier 0 locomotives;



- there is no commercial reason for shortlines to buy Tier 3 locomotives which require costly repairs and retrofitting to be made fit for purpose and are substantially more expensive to maintain;
- regulatory requirements often require the Tier 3 locomotives to be sold when replaced; and,
- as a result of these factors and the amount of metal on a locomotive, the scrappage market value for the Tier 3 locomotive usually exceeds the value in the used locomotive market.

Since late 2018, Mr. Hart has been actively engaged in outreach to CARB to convince the agency that Sierra Railroad has identified a path to a cleaner locomotive future that is fully aligned with California's criteria-pollutant and GHG-pollutant reduction goals and that this strategy can be executed with a modest level of state support. This process has thus far been fruitless and frustrating, with CARB staff and management consistently praising the proposed approach for its cost-effectiveness and pollution reduction potential while just as consistently advising that the state is unwilling to fund the replacement of Pre-Tier 0 locomotives with Tier 3 locomotives.

The reasonableness and viability of this proposed alternative is clearly illustrated by comparing the cost-effectiveness and emission reductions that result from replacing 11 Pre-Tier 0 locomotives with 11 Tier 3 locomotives as compared to the cost and emission reductions provided by replacing a single Tier 4 locomotive.<sup>3</sup> The cost-effectiveness methodology established by the Carl Moyer Program is used in this analysis. A key factor that renders it so cost-ineffective to deploy Tier 4 locomotives in the shortline railroad industry is the relatively small number of miles traveled by these locomotives when compared to the line-haul industry.

	<b>Proposed Project</b>	<b>Tier 4 Locomotive</b>
<b>Number of Locomotives</b>	11	1 (San Joaquin)
<b>Total Cost of Project</b>	\$3,850,000	\$2,850,000
<b>Cost Effectiveness (Dollars per weighted ton)</b>	\$18,228.73	\$116,791.16
<b>Max Funding (85% funding)</b>	\$3,272,500	\$2,422,500
<b>NOx Emission Reductions (tons per year)</b>	13.50	1.44
<b>ROG Emission Reductions (tons per year)</b>	0.50	0.09
<b>PM Emission Reductions (tons per year)</b>	0.34	0.03

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<sup>3</sup> This analysis was done using an estimate of \$2,850,000 as the Tier 4 acquisition cost which is lower than the \$3,000,000 cost that CARB provided as an estimate at the In-Use Locomotive Regulation Workshop.



### **Conclusion**

Sierra Railroad appreciates the opportunity to provide a response to the NOP. Sierra Railroad is fully supportive of CARB's objectives to reduce criteria and GHG-pollutants in the shortline industry. Sierra Railroad seeks to work with CARB to identify a "win-win" solution for the state that achieves these goals while also maintaining the jobs and economic value that the shortline industry delivers to the State.

Sincerely,

A handwritten signature in blue ink, reading 'Graham Noyes', is displayed on a light blue background.

Graham Noyes

Cc: Michael Hart, Sierra Railroad Company

## **Exhibit B-1**

### **Sierra Rail Carl Moyer Calculations- Switcher Factors**

#### ***Calculation Inputs***

	San Joaquin (per locomotive)	Sacramento (per locomotive)	Mendocino (per locomotive)
Number of Locomotives	6	3	3
Cost (per locomotive)	\$350,000	\$350,000	\$350,000
Total Cost of Project	\$2,100,000	\$1,050,000	\$1,050,000
Cumulative Fuel Consumption (gallons/year)	34,100	9,217	25,786
NOx Emission Factor (g/bhp-hr)	4.7	4.7	4.7
ROG Emission Factor (g/bhp-hr)	0.63	0.63	0.63
PM Emission Factor (g/bhp-hr)	0.086	0.086	0.086
CRF	0.106	0.106	0.106
Operation	100%	100%	100%

#### ***Calculation Results***

	San Joaquin (per locomotive)	Sacramento (per locomotive)	Mendocino (per locomotive)
Cost Effectiveness (Dollars per weighted ton)	\$3,078.35	\$11,388.92	\$4,070.88
Max Funding (85% funding)	\$297,500	\$297,500	\$297,500
NOx Emission Reductions (tons per year)	6.66	1.80	5.04
ROG Emission Reductions (tons per year)	0.25	0.07	0.19
PM Emission Reductions (tons per year)	0.17	0.05	0.13

## **Exhibit B-2**

### **Sierra Rail Carl Moyer Calculations – Linehaul Factors**

#### ***Calculation Inputs***

	San Joaquin (per locomotive)	Sacramento (per locomotive)	Mendocino (per locomotive)
Number of Locomotives	6	3	3
Cost (per locomotive)	\$350,000	\$350,000	\$350,000
Total Cost of Project	\$2,100,000	\$1,050,000	\$1,050,000
Cumulative Fuel Consumption (gallons/year)	34,100	9,217	25,786
NOx Emission Factor (g/bhp-hr)	5.17	5.17	5.17
ROG Emission Factor (g/bhp-hr)	0.32	0.32	0.32
PM Emission Factor (g/bhp-hr)	0.086	0.086	0.086
CRF	0.106	0.106	0.106
Operation	100%	100%	100%

#### ***Calculation Results***

	San Joaquin (per locomotive)	Sacramento (per locomotive)	Mendocino (per locomotive)
Cost Effectiveness (Dollars per weighted ton)	\$4,219.78	\$15,611.87	\$5,580.34
Max Funding (85% funding)	\$297,500	\$297,500	\$297,500
NOx Emission Reductions (tons per year)	4.03	1.09	3.05
ROG Emission Reductions (tons per year)	0.109	0.029	0.0821
PM Emission Reductions (tons per year)	0.17	0.05	0.13



**REGULATORY ANALYSIS**

October 12, 2020

TO: DEPUTY EXECUTIVE OFFICER STEVE CLIFF  
ACTING DIVISION CHIEF SYDNEY VERGIS  
ASSISTANT DIVISION CHIEF MIKE CARTER  
BRANCH CHIEF SCOTT ROWLAND  
CALIFORNIA AIR RESOURCES BOARD

FROM: GRAHAM NOYES, REGULATORY COUNSEL FOR SIERRA RAILROAD

RE: Definition of Surplus and State Implementation Plan Creditable Emissions under  
the Carl Moyer Program Statutes and Federal Law

**Background Summary:** Michael Hart is a longstanding environmentalist who has more than 25 years of experience forming and operating environmentally-friendly industrial companies. One of his companies, Sierra Railroad Company (“Sierra”), owns and operates shortline freight and tourist railroads. Its subsidiaries include Sierra Northern Railway (a freight railroad) and Mendocino Railway (a tourist railroad which operates the Skunk Train and the Sacramento River Fox Train). Though the railroad industry has long been relatively immune from pollution regulation, Mr. Hart has made Sierra a leader in reducing both criteria-pollutants and GHG-pollutants through innovative clean-energy technologies, including the development and deployment of waste-to-fuel technologies such as Sierra Energy Corporation, another company owned by Sierra that is a world leader in converting non-recyclable wastes into *carbon-negative* fuels for use in the railroad industry and elsewhere. Mr. Hart’s environmental efforts have not only earned him an “Environmental Hero” award from the United States Environmental Protection Agency (“EPA”) but resulted in President Obama naming him a “Champion of Change.”

Toward the end of 2018, Mr. Hart learned that Union Pacific Railroad was about to scrap a fleet of Tier III locomotives. Though Sierra’s 11 Pre-Tier 0 locomotives were perfectly functional and met all of Sierra’s needs, such that Sierra had no plans to, and no need to, upgrade its existing Pre-Tier 0 locomotives, Mr. Hart realized that the Tier III locomotives that were about to be destroyed produced far fewer emissions than Sierra’s Pre-Tier 0 locomotives. Mr. Hart also realized that the cost to replace Sierra’s existing Pre-Tier 0 locomotives with these Tier III locomotives would be incredibly cost-effective compared with other emissions reduction

projects, being less costly than upgrading just two pre-Tier 0 locomotives to Tier IV. Indeed based on a Carl Moyer Program cost-effectiveness analysis, the emission reductions provided by upgrading Sierra's 11 Pre-Tier 0 locomotives to Tier III would result in a 90% reduction in total costs to the state of California as compared to a Tier IV upgrade.<sup>1</sup> Knowing from experience that it would take time to work out any details with the State of California for a grant to purchase and upgrade Sierra's locomotives (the "Project"), but realizing that any delay would result in the destruction of the Tier III locomotives and the loss of an opportunity to improve California's air quality at a fraction of the normal cost to do so, Mr. Hart purchased the locomotives and began discussions with the State as to how to fund his preservative purchase and the work needed to render the locomotives usable in California.

Mr. Hart has for the past 18 months been in discussions with the California Air Resources Board ("CARB") as to using the Carl Moyer Program ("CMP") to fund his acquisition costs for the 11 locomotives, as well as the retrofit costs necessary to put the locomotives into service. Based on a July 10, 2020 discussion with CARB, and subsequent discussions with Scott Rowland, Sierra has been advised that the primary impediment to CMP funding is the question of whether emission reductions from the Project meet federal and state requirements for "surplus" emission reductions (this issue has also been phrased in terms of whether the Project's emission reductions are creditable under the State Implementation Plan, or, in other words, "SIP creditable"). This regulatory analysis addresses these issues and the relevant authority, concluding that this Project does indeed meet "surplus" emission reduction requirements and that the resulting emission reductions are SIP creditable.

## **LEGAL ANALYSIS**

### **Applicable CMP Guidelines:**

The Program Overview to the CMP Guidelines (the "Guidelines") state:

Although the Moyer Program has grown in scope, it retains its primary objective of obtaining cost-effective and surplus emission reductions to be credited toward California's legally-enforceable obligations in the State Implementation Plan ("SIP")- California's road map for attaining health-based national ambient air quality standards.<sup>2</sup>

The Guidelines further state:

Emission reductions funded through the Moyer Program must be permanent, surplus, quantifiable, and enforceable in order to meet the underlying statutory provisions and be SIP-creditable. To

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<sup>1</sup> Note that while Ken Bhatti of CARB's locomotive CMP group has reviewed the cost-effectiveness of the Sierra Project and recognized it as highly cost-effective, the Tier 4 calculations have not yet been reviewed by CARB staff.

<sup>2</sup> Carl Moyer Program Guidelines (2017 Revisions), at Chapter 1 ("Program Overview"), at p. 1-1.

ensure that projects are surplus to regulations, funded projects must not be required by any federal, State or local rule or regulation.<sup>3</sup>

As to the question of SIP creditability, the Guidelines state:

The State Board and the air districts shall take all appropriate and necessary actions to ensure that all covered emission reductions achieved from a Moyer Program project are creditable in the State Implementation Plans (SIP) and are enforceable, surplus, quantifiable and permanent (H&SC § 44286(g)).<sup>4</sup>

California Health and Safety Code §44286(g) provides:

The state board and the districts shall take all appropriate and necessary actions to ensure that emissions reductions achieved through the program are credited by the United States Environmental Protection Agency to the appropriate emission reduction objectives in the state implementation plan.<sup>5</sup>

The applicable questions are thus: (1) whether the emissions reductions that would be created by the Project are required by any Federal, State, or Local Rule or Regulation, and (2) whether those emissions reductions are SIP creditable by EPA?

**CMP Funding is Permitted as Project Emissions Reductions are not Required by Federal, State, or Local Rules or Regulations:**

As noted above, CMP funding is only permitted if the emission reductions created by a project are not required by federal, state, or local rules or regulations.

As relevant here, railroads have been largely immune from environmental regulation, especially state regulation, as state regulation of railroads is generally pre-empted by federal law.<sup>6</sup> This preemption means that the United States Surface Transportation Board (“STB”) has “exclusive” jurisdiction over “transportation by rail carriers.”<sup>7</sup> And the ICCTA defines “transportation” broadly to include any “property, facility, instrumentality, or equipment of any kind related to the movement of passengers or property, or both, by rail,” as well as “services related to that movement.”<sup>8</sup> This, and the STB’s exclusive jurisdiction over railroads, means that state and local environmental permitting are categorically preempted.<sup>9</sup>

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<sup>3</sup> Id. at p. 1-2. Chapter 2 (General Criteria) of the Guidelines repeats this same requirement, stating: “Covered emission reductions obtained through Moyer Program projects must not be required by any federal, State or local rule or regulation, memorandum of agreement, memorandum of understanding, settlement agreement, mitigation requirement, or other legal mandate.” Id. at p. 2-1.

<sup>4</sup> Id. at p. 2-2.

<sup>5</sup> Ca. H&SC § 44286(g).

<sup>6</sup> The Interstate Commerce Commission Termination Act (“ICCTA”) was passed “with the purpose of expanding federal jurisdiction and preemption of railroad regulation.” *Or. Coast Scenic R.R., LLC v. Or. Dep’t of State Lands*, 841 F.3d 1069, 1072 (9th Cir. 2016).

<sup>7</sup> 49 U.S.C. § 10501(b).

<sup>8</sup> Id. § 10102(9); see also *Or. Coast Scenic R.R.*, 841 F.3d at 1073.

<sup>9</sup> *Friends of Eel River v. North Coast R.R.*, 399 P.2d 37, 60 (Cal. 2017) (holding that “state environmental permitting or preclearance regulation that would have the effect of halting a private railroad project pending environmental



As state and local environmental rules and regulations are preempted, and as no federal rule or regulation requires Sierra to reduce the emissions produced by its Pre-Tier 0 locomotives, CARB staff, management, and leadership have properly acknowledged in discussions with Sierra that this Project's emission reductions are not required by any federal, state, or local rule or regulation, any memorandum of agreement or understanding, any settlement agreement, any mitigation requirement, or any other legal mandate. This requirement for CMP funding is thus met and the question turns to whether the Project's emissions reductions are SIP creditable.

### **CMP Funding is Permitted as Project Emission Reductions are SIP Creditable by EPA:**

The EPA has issued multiple guidance documents to clarify what projects are SIP-creditable. As relevant here, this question turns on whether the relevant emissions reductions qualify as "surplus" emissions reductions and meet other relevant EPA criteria pertaining to SIP creditability.<sup>10</sup>

The EPA's 1997 Guidance on Incorporating Voluntary Mobile Source Emission Reductions in State Implementation Plans ("EPA SIP Guidance") defines "surplus" as follows:

The VMEP emission reductions may not be substituted for mandatory, required emission reductions. States may submit to EPA for approval any program that will result in emission reductions in addition to those already credited in a relevant attainment or maintenance plan, or used for purposes of SIP demonstrations such as conformity, rate of progress, or emission credit trading programs.<sup>11</sup>

The EPA's definition of "surplus" thus matches the CMP's requirement that project emissions reductions not be required by any law or regulation. And – as shown above – the emission reductions from Sierra's Project already meet that requirement, these emission reductions qualify as "surplus" under the EPA's definition and are thus SIP creditable.

However, in its discussions with Sierra, CARB staff have noted that the EPA has urged states when determining whether project emissions reductions are "surplus" to "consider factors that may affect emission reductions and their surplus status over time, including changing patterns of

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compliance would be categorically preempted"); see also *North San Diego County Transit Dev. Bd.—Petition for Declaratory Order*, 2002 WL 1924265 (STB 2002) (holding that the Coastal Act was preempted by ICCTA as applied to rail projects).

<sup>10</sup> See, e.g., "Guidance on Incorporating Voluntary Mobile Source Emission Reduction Programs in State Implementation Plans (SIPs)," EPA, Office of Air and Radiation, October 24, 1997 (hereafter "1997 VMEP") at 6; "Improving Air Quality with Economic Incentive Programs," EPA, Office of Air and Radiation, January 2001 (hereafter "2001 EIP Guidance") at 35; "Incorporating Emerging and Voluntary Measures in a State Implementation Plan," EPA, Office of Air and Radiation, September 2004 (hereafter "2004 Emerging and Voluntary Measures Guidance") at 3; and "Diesel Retrofits: Quantifying and Using Their Emission Benefits in SIPs and Conformity," EPA, Office of Transportation and Air Quality, February 2014 (hereafter "2014 Diesel Retrofits Guidance") at 27.

<sup>11</sup> 1997 VMEP at p. 6, available at <https://www.epa.gov/sites/production/files/2016-05/documents/vmep-gud.pdf> (last viewed August 26, 2020).

operations or use, vehicle deterioration factors, equipment useful life, and government emission standards.”<sup>12</sup> CARB staff have pointed to legal authority pertaining to the San Joaquin Unified Air Pollution Control District wherein EPA has explained that:

As we explained in the Proposal TSD, in future SIP submittals developed pursuant to Rule 9610, we expect the State and/or District will demonstrate: (1) How the “project life” for each funded project relied on for SIP credit takes into account the remaining useful life of the vehicle, engine, or equipment being replaced, and (2) how the State and/or District ensure that the emission reductions relied on for SIP credit are in excess of the reductions attributed to normal fleet turnover and other assumptions built into future year emissions inventories (i.e., that the same emission reductions are not “double counted”).<sup>13</sup>

Based upon this guidance from the EPA, CARB staff have questioned whether Sierra would not have replaced its Pre-Tier 0 locomotives anyway, in the normal course of its business?

The answer to CARB’s question is that Sierra has no business reason to replace its Pre-Tier 0 locomotives as those locomotives have a remaining useful life of at least 30 years, a fact that CARB has publicly acknowledged. For example, CARB’s Air Quality Planning and Science Division held a September 3, 2020 public workshop on the state’s 2020 locomotive emissions inventory, that addressed the state’s shortline railroad industry.<sup>14</sup> While CARB has not publicly released any written report concerning CARB’s Air Quality Planning and Science Division’s findings, its presentation at the workshop contained the following acknowledgements about shortline locomotives:

- Regarding Growth: “Assumed to be constant- no available future plans.”
- Regarding Turnover:
  - “Assumed no turnover- companies do not make long-range business plans.”
  - “Average age is 43 years old.”
  - “(Engines have been bought, sold, leased over and over again).”<sup>15</sup>

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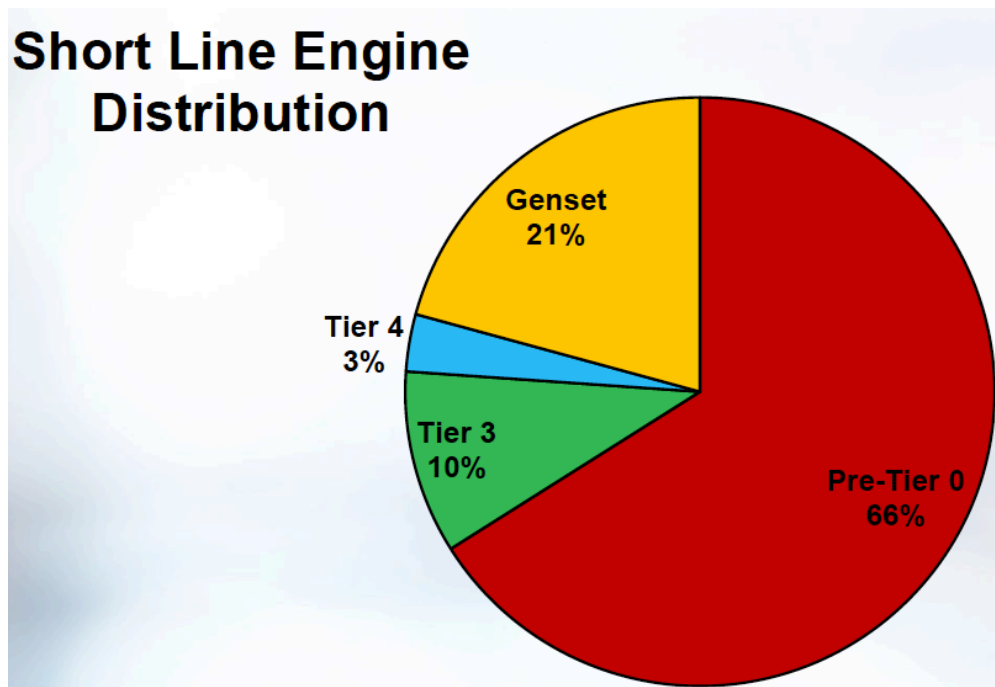
<sup>12</sup> See EPA, Revisions to the California State Implementation Plan; San Joaquin Valley Unified Air Pollution Control District; Quantification of Emission Reductions From Incentive Programs, 80 Fed. Reg. 19020 (April 9, 2015) (hereafter “EPA Final Rule on SJV APCD Rule 9610”), at 19024.

<sup>13</sup> Id.

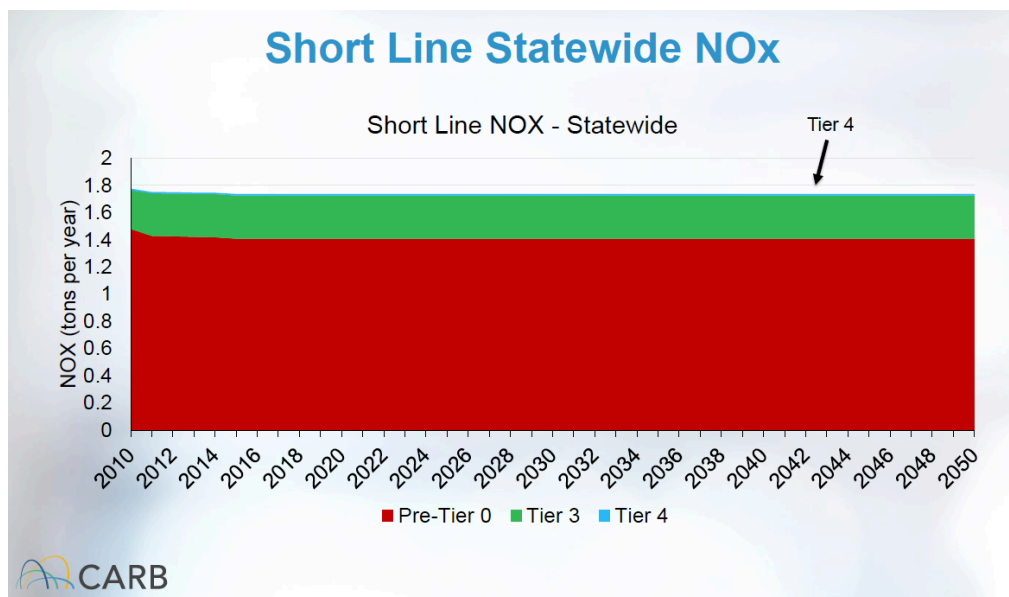
<sup>14</sup> The Workshop Presentation and Workshop Announcement for the September 2020 Public Workshop for Locomotive Emission Inventory are available at <https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/msei-meetings-workshops>.

<sup>15</sup> CARB Website, “2020 Locomotive Emissions Inventory,” Presentation for Public Workshop prepared by Air Quality Planning & Science Division (September 3, 2020), at <https://ww2.arb.ca.gov/sites/default/files/2020-09/CARBlocoinvwebinar2020.pdf>, slide 40.

The presentation developed by CARB's Air Quality Planning and Science Division displayed California's shortline railroads' locomotive tier distribution as follows:<sup>16</sup>



As a result of this, CARB's Air Quality Planning and Science Division presented California shortline NOx emissions as completely static over the past 10 years, predicting that these emissions would remain static for 30 years to come:<sup>17</sup>



<sup>16</sup> Id., at slide 41.

<sup>17</sup> Id., at slide 42.

Based upon these slides from CARB's Air Quality Planning and Science Division, CARB has correctly determined that no Pre-Tier 0 locomotives are likely to be retired in California over the next three decades. Sierra's fleet of Pre-Tier 0 locomotives are, of course, within the scope of CARB's forecast.

Given that CARB has itself determined that Sierra's Pre-Tier 0 locomotives have a useful life of at least 30 more years, and given that Sierra's CEO has stated that Sierra has not had, and does not have, any plans to replace these locomotives absent CMP funding of this Project, it should be evident that the EPA's "surplus" test has been satisfied, that the emissions reductions expected from this Project will not be double-counted, and that this Project is SIP creditable.

### **Conclusion:**

As set forth in this regulatory analysis, and consistent with CARB's recent analysis of the shortline industry, nothing precludes using Carl Moyer Program dollars to fund Sierra's proposed Project to replace 11 Pre-Tier 0 locomotives – which are perfectly functional and adequate for Sierra's needs for at least 30 more years – with 11 Tier III locomotives.

In addition to the legal merits of this Project, the environmental merits make this Project incredibly attractive as it would reduce pollutant emissions in California by \$4,860 ton. Due to the ever-increasing costs of achieving criteria pollutant reductions, this would make the Project among the most cost-effective locomotive projects undertaken in the past decade, and compares very favorably to a single Tier IV Class 3 project, estimated to cost \$116,791 per ton. This Project would also be replicable in California's shortline industry which currently includes 102 pre-Tier 0 locomotives.<sup>18</sup>

Sierra incurred financial cost and risk by acting to save the 11 Tier III locomotives in question from scrap almost two years ago in the hopes of finding a path forward for supporting their conversion to shortline use. Should CARB not be able to find a way forward to fund this project, Sierra will have to send the Tier III locomotives back to be scrapped, as Sierra cannot afford to competitively disadvantage itself in the market by replacing its perfectly usable Pre-Tier 0 locomotives with these Tier III locomotives solely because of better emissions performance. This outcome would effectively force Sierra to continue to use its existing Pre-Tier 0 locomotives, and the substantial opportunity for emission reductions in the San Joaquin Valley, Mendocino, and Sacramento air districts would be lost.

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<sup>18</sup> Information regarding California's shortline locomotive fleet was provided by July Schiffman of CARB's Off-Road Diesel Analysis Section by email on October 8<sup>th</sup> and 9<sup>th</sup>, 2020. Ms. Schiffman advised that there are 127 locomotives and 32 Genset engines in the fleet. Of the locomotives, 5 are Tier IV, 17 are Tier III, and 102 are pre-Tier 0. Of the Gensets, 3 are Tier IV and 29 are Tier III.



# Freight Railroads in California

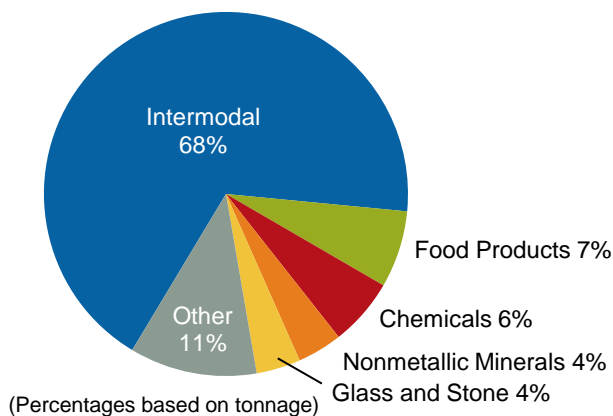
## Rail Fast Facts For 2017

<b>Operations</b>	Number of freight railroads	25
	Freight railroad mileage	4,828
<b>Employment and Earnings</b>	Number of freight rail employees	8,153
	Average wages & benefits per freight rail employee	\$123,400
<b>Railroad Retirement</b>	Number of railroad retirement beneficiaries	25,593
	Railroad retirement benefits paid	\$572 million
<b>Economic Impact</b>	Nationwide, in 2017, major U.S. railroads supported approximately 1.1 million jobs (about eight jobs for every railroad job), nearly \$219.5 billion in annual economic activity, \$71 billion in wages and almost \$26 billion in tax revenues.	
<b>Fuel Efficiency</b>	In 2017, America's railroads moved a ton of freight an average of 479 miles on one gallon of fuel. That's like going from Los Angeles to Tucson, AZ. On average, railroads are four times more fuel efficient than trucks. Moving freight by rail instead of truck reduces greenhouse gas emissions by on average 75 percent.	
<b>Cutting Highway Gridlock</b>	One train can carry as much freight as several hundred trucks. It would have taken approximately 9.0 million additional trucks to handle the 162.0 million tons of freight that originated in, terminated in, or moved through California by rail in 2017.	

## Rail Traffic Originated in 2017

Total Tons: 60.8 million

Total Carloads: 3,517,800



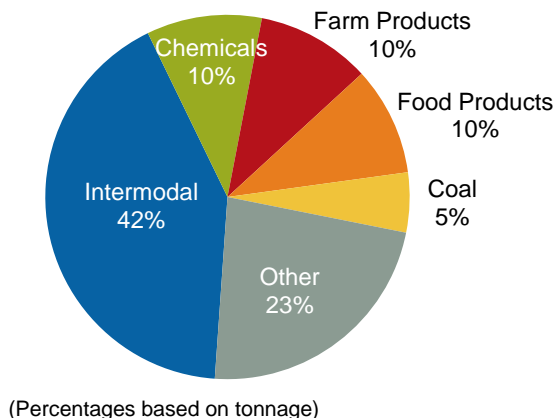
Commodity	Tons	Carloads
Intermodal	41,286,000	3,242,200
Food Products	4,163,000	53,000
Chemicals	3,651,000	37,300
Nonmetallic Minerals	2,428,000	40,600
Glass and Stone	2,386,000	21,900
Other	6,880,000	122,700

Source: AAR Analysis of STB Waybills

## Rail Traffic Terminated in 2017

Total Tons: 104.2 million

Total Carloads: 3,630,000



Commodity	Tons	Carloads
Intermodal	43,431,000	2,863,500
Chemicals	10,662,000	112,000
Farm Products	10,562,000	103,300
Food Products	10,056,000	106,400
Coal	5,540,000	47,800
Other	23,928,000	397,000

Source: AAR Analysis of STB Waybills

	Miles Operated In California in 2017
<b>Class I Railroads</b>	
BNSF Railway Company	2,169
Union Pacific Railroad Co.	3,291
	<hr/> 5,460
<b>Regional Railroads</b>	
(none)	
<b>Local Railroads</b>	
Arizona & California Railroad Co.	91
Central Oregon & Pacific Railroad	65
Goose Lake Railway, LLC	38



Map is based on the 2018 National Transportation Atlas Database published by the U.S. DOT, Bureau of Transportation Statistics.

California 2017 Totals	Number of Freight Railroads	Miles Operated	
		Excluding Trackage Rights	Including Trackage Rights
Class I	2	3,663	5,460
Regional	0	0	0
Local	15	862	1,062
Switching & Terminal	8	303	381
<b>Total</b>	<b>25</b>	<b>4,828</b>	<b>6,903</b>

	Miles Operated In California in 2017
<b>Local Railroads, cont.</b>	
Northwestern Pacific Railroad	62
Pacific Sun Railroad, LLC	67
Sacramento Valley Railroad	9
San Diego & Imperial Valley Railroad	43
San Joaquin Valley Railroad Co.	492
Santa Cruz and Monterey Bay Railway Co.	32
Santa Maria Valley Railroad	14
Sierra Northern Railway	75
Stockton Terminal & Eastern Railroad	25
Trona Railway Co.	31
Ventura County Railroad Company	13
West Isle Line, Inc.	5
	<hr/> 1,062
<b>Switching &amp; Terminal Railroads</b>	
California Northern Railroad	283
Modesto & Empire Traction Co.	5
Napa Valley Railroad Co.	21
Pacific Harbor Line, Inc.	51
Quincy Railroad	3
Richmond Pacific Railroad Corp.	11
San Francisco Bay Railroad	5
West Oakland Pacific Railroad	2
	<hr/> 381

**Class I Railroad:** A railroad with 2017 operating revenues of at least \$447.6 million. **Regional Railroad:** A non-Class I line-haul railroad that has annual revenues of at least \$40 million, or that operates at least 350 miles of road and revenues of at least \$20 million. **Local Railroad:** A railroad which is neither a Class I nor a Regional Railroad, and which is engaged primarily in line-haul service. **Switching & Terminal Railroad:** A non-Class I railroad engaged primarily in switching and/or terminal services for other railroads.

**SIERRA RAILROAD EXHIBIT****Alternative 4 from Initial Statement of Reasons (p. 212-213)**

(Excerpt from ISOR, begin Alternative 4 description and analysis):

**D. Alternative 4 “Sierra’s Proposal” Provided by Noyes Law Corporation for Sierra Railroad on December 23, 2020**

Alternative 4, submitted by Sierra Railroad, would change the way CARB regulates Class III (shortline) locomotive operators under the Proposed Regulation. Specific elements of Alternative 4 are outlined below.

**1. Allow Locomotives to be upgraded to Tier 3 rather than Tier 4 and provide funding.**

According to Sierra’s proposal many pre-Tier 0 locomotives could be upgraded to Tier 3 locomotives for approximately ten percent of the cost to upgrade to a Tier 4 locomotive while still reducing PM10 emissions by 75 percent and NOx emissions by 62 percent. This proposal requests modifications to the applicability requirements of the Carl Moyer Program. Specifically, Alternative 4 would allow Carl Moyer Program funding for the purchase of Tier 3 locomotives.

Alternative 4 suggests that by allowing Tier 3 locomotives to be purchased in place of Tier 4 locomotives, emission reductions would be greater and come earlier than with the Proposed Regulation. Because Tier 3 locomotives can be purchased in the used market at a significantly lower cost, locomotive operators would be able to replace the oldest locomotives sooner than if required to purchase Tier 4 or cleaner locomotives.

**2. Allow Tier 3 Locomotives to operate in California longer than 23 years.**

Alternative 4 would also allow Tier 3 locomotives to operate in California longer than the 23 years under the IUOR.

**3. Alternative 4 Analysis.**

Alternative 4 may result in reduced costs to the locomotive operator relative to the Proposed Regulation due to:

- Lower cost to purchase a locomotive if grant funds were extended to Tier 3 purchases.
- Increased life of a locomotive due to the extension beyond 23 years of operation.

Compared to the Proposed Regulation, Alternative 4 would achieve substantially less emission reductions for PM2.5 and NOx. In addition, Alternative 4 would produce even fewer emission reductions than Alternative 3, an Alternative already rejected in this analysis because it would provide fewer emission reductions than the Proposed Regulation. As a result, Alternative 4 would fail to provide significant public health benefits, including to communities adjacent to railyards and freight facilities throughout the state, due to:

- Tier 3 locomotive emissions of PM2.5 are over three times higher than Tier 4 locomotive emissions.
- Tier 3 locomotive emissions of NOx are over four times higher than Tier 4 locomotive emissions.

Alternative 4 does not give a date for when Tier 3 locomotives would be turned over to Tier 4 or ZE. This disables a key effect of the Proposed Regulation: to move locomotive operations to cleaner emission levels at the earliest feasible dates.

Although Alternative 4 provides limited cost benefits to locomotive operators in a case where incentives are made available for older, higher-polluting technologies, it does not provide additional health benefits to California residents. In this case, the proposal to use grant funding for Tier 3 is also in conflict with CARB grant funding objectives: CARB public grant funds are provided by the citizens of California and must be used to fund

the most cost-effective projects, from an emission reduction standpoint. CARB incentives may not be used to pay for compliance, limiting the scope of incentives applicability to the years before the IUOR trigger date of 2030. Alternative 4 does not meet the requirements of being less burdensome and equally effective in achieving the purposes of the Proposed Regulation.

(end Alternative 4 description and analysis)