

**Supplement to the June 2010 Staff Report on**  
***Proposed Actions to Further Reduce***  
***Diesel Particulate Matter at High-Priority California Railyards***



Note: This report includes the California Environmental Quality Act Functional Equivalent Environmental Document Evaluating the Revised 2010 Commitments Between the Air Resources Board and Union Pacific Railroad and BNSF Railway to Further Reduce Diesel Particulate Emissions at Four High-Priority Railyards. The public comment period on the environmental document closes on August 19, 2011.

**July 5, 2011**

California Environmental Protection Agency

 **Air Resources Board**

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## **AIR RESOURCES BOARD**

# **Supplement to the June 2010 Staff Report on Proposed Actions to Further Reduce Diesel Particulate Matter at High-Priority California Railyards**

**July 5, 2011**

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## EXECUTIVE SUMMARY

### I. INTRODUCTION

In June 2010, Air Resources Board (ARB or Board) staff released a report entitled *Proposed Actions to Further Reduce Diesel Particulate Matter at High Priority California Railyards* (June 2010 Report) and requested Board approval of set of voluntary, binding agreements with BNSF Railway and Union Pacific (UP) Railroad to reduce emissions of toxic diesel particulate matter (PM) at four railyards in Southern California with high estimated health risks. We refer to these agreements as the 2010 Commitments. The four railyards are the BNSF San Bernardino and Hobart Railyards, and the UP Commerce and ICTF/Dolores Railyards.

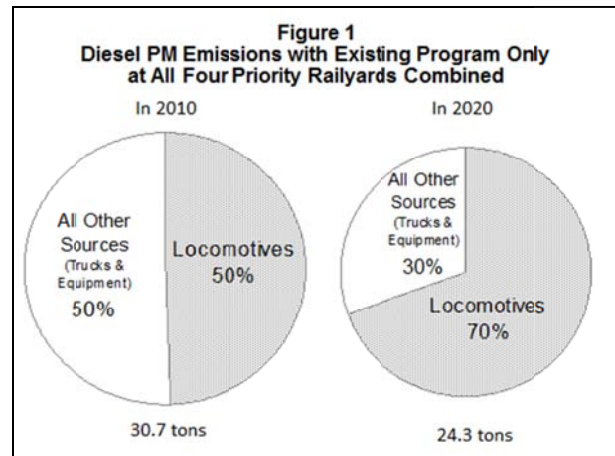
On June 24, 2010, the Board considered the June 2010 Report and public comments. At that meeting, the Board adopted Resolution 10-29, which delegated authority to the Executive Officer to approve the 2010 Commitments subject to performance of additional environmental analysis, and suggested that staff, in light of comments received at the hearing, continue to meet with the railroads to strengthen the accountability provisions in the proposed 2010 Commitments. ARB staff met with the railroads, incorporated the suggested additions and posted an interim revised version of the 2010 Commitments on the website on January 7, 2011 for public review.

This new document, *Supplement to the June 2010 Staff Report on Proposed Actions to Further Reduce Diesel Particulate Matter at High-Priority California Railyards*, provides updated material. This supplement presents ARB staff's revised estimates of diesel PM emissions and health risk at each railyard. It also includes the latest text of the *Revised 2010 Commitments Between the Air Resources Board and Union Pacific Railroad and BNSF Railway to Further Reduce Diesel Particulate Emissions at Four High-Priority Railyards* ("Revised 2010 Commitments") for each railyard. This report also includes an expanded evaluation of the potential environmental impacts of the Revised 2010 Commitments.

**There is a 45-day public comment period for the environmental analysis in Appendix F, which runs from July 5, 2011 to August 19, 2011.** Please see the appendix for details on how to submit comments to ARB on this analysis.

The Revised 2010 Commitments would establish enforceable emission caps and other requirements, tracking mechanisms and deadlines to further reduce harmful diesel PM through 2020. The diesel PM emission reduction requirements for each railyard have not changed from the June 2010 proposal. Staff is proposing these voluntary agreements because they are the most effective and most certain way to achieve substantial new diesel PM emission reductions beyond the existing program of regulations and agreements. Any successful effort to secure substantial new reductions must capture the largest sources of railyard diesel PM emissions -- locomotives.

ARB lacks authority to regulate the emissions of late-model or remanufactured locomotives that contribute the majority of the diesel PM emissions at these railyards in future years, as shown in Figure 1. Under the federal Clean Air Act, ARB can regulate only the oldest locomotives, which no longer regularly operate in these four railyards. ARB has already regulated the railyard sources under its direct authority, including drayage trucks, cargo handling equipment, transport refrigeration units, and diesel fuel.



## II. UPDATED EMISSIONS AND HEALTH RISK

Appendix A presents ARB staff's updated estimates of the emissions and health risk associated with diesel PM from operations at each railyard. The most significant change was to reflect the actual cargo activity at each railyard in 2010 and to update the projected cargo growth rates for 2011-2020. The changes in cargo activity affect all of the diesel PM emission sources at the railyards. Cargo activity was lower in 2010 than in 2005 at the BNSF San Bernardino, BSNF Hobart, and UP ICTF/Dolores railyards due to the recession. UP Commerce was the only railyard to show a steady increase in cargo activity from 2005 through 2010. Relative to the numbers in the June 2010 Staff Report, the updated emission estimates presented in this supplement reflect the actual 2010 activity and revised growth projections, the cleaner locomotive fleet in operation at these railyards in 2010, and minor improvements in the emissions forecasting methodology.

Table 1 shows the resulting updated diesel PM cancer risk estimates for 2010, as well as revised projections of the cancer risk in future years with implementation of the Revised 2010 Commitments. All yards continue to show a substantial drop in risk between 2005 and 2010 due to the introduction of much cleaner trucks, locomotives, equipment, and fuel in this period. The Revised 2010 Commitments would ensure that emission levels continue to decline even as the freight industry rebounds.

For the three yards that recorded less cargo activity in 2010 than in 2005, the health risks for 2010 are markedly lower than the values presented in the June 2010 Staff Report. Most notable is the decrease in current risk at the highest risk railyard in 2010, 2015, and 2020. For BNSF San Bernardino, the maximum individual cancer risk for 70-year exposure went from 2,500 chances in a million in 2005, down to 650 chances in million in 2010.



**Table 1**  
**Updated Reduction in Diesel PM Health Risk with the Revised 2010 Commitments**  
**at the Four High-Priority Railyards in Southern California**

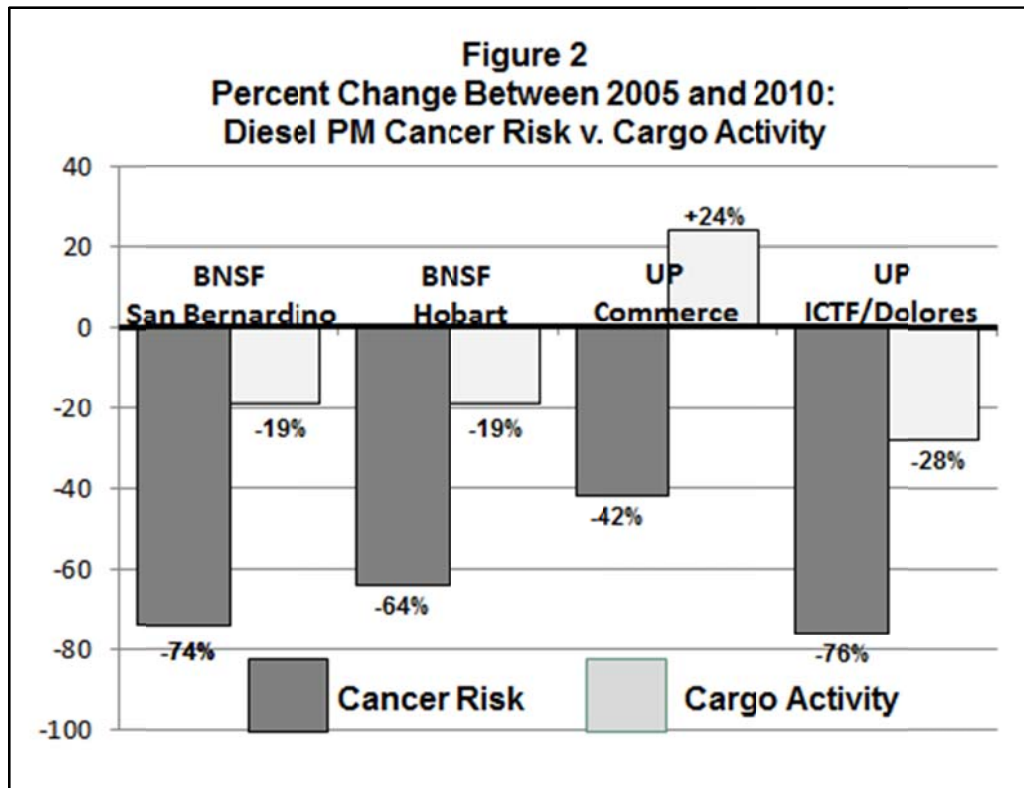
Railyard	Maximum Individual Cancer Risk for 70-Year Exposure* (chances per million)			
	2005	2010	2015	2020
BNSF San Bernardino	2,500	650	500	275
BNSF Hobart	500	180	120	75
UP Commerce	500	290	155	75
UP ICTF/Dolores	800	190	180	120

\* Risk estimates for BNSF San Bernardino Railyard consider both the source and location of the diesel PM emissions within the railyard in each year, consistent with the method used to develop the 2005 numbers. For the other railyards, the 2005 and later risk estimates are based on the total diesel PM emissions within each railyard facility.

The key factor in the sharp risk reduction at the BSNF San Bernardino Railyard is the transition of most of the drayage truck fleet to cleaner models by 2010, as required by ARB regulation. The risk estimate for this yard reflects the use of cleaner equipment of all types (including the introduction of several low-emission switch locomotives co-funded by federal and State incentives), a drop in cargo activity from 2005 to 2010, and a more refined technical approach. Consistent with the health risk assessment that generated the 2005 number, ARB staff applied the same methodology that considers both the source and location of diesel PM emissions to estimate the cancer risk in 2010, 2015, and 2020. This means that the diesel PM emission sources that operate closest to where people live (like drayage trucks) have a greater impact on risk and risk reductions than the equipment that operates further away.

The risk at UP Commerce in 2010 is slightly higher than projected in the June 2010 Staff Report (290 in a million now versus 240 in a million previously) because of the steady growth in cargo activity at this yard between 2005 and 2010. This growth means the Revised 2010 Commitments would require the railroad to start achieving additional reductions beyond the existing program *this year* to meet the emissions caps.

Figure 2 compares the reduction in cancer risk versus the change in cargo activity. The recession-induced decline in cargo activity accelerated the reduction in health risk at three of the four yards, but it was not the primary factor. The risk associated with the UP Commerce Railyard also showed a substantial decrease, despite the net increase in cargo activity. The figure illustrates that the significant reduction in health risk between 2005 and 2010 is driven by the introduction of cleaner trucks, equipment, locomotives, and fuel in response to adopted regulations and agreements.



### III. LATEST DRAFTS OF REVISED 2010 COMMITMENTS

Appendices B-E include the current drafts of the Revised 2010 Commitments. These are similar to the versions posted on ARB's website on January 7, 2011 that reflected the substantial changes made to the initially proposed versions to strengthen accountability following the June 2010 Board meeting. The primary change between January 2011 and the current versions is to remove the requirements for preparation and submittal of documents in 2011 given the extended timeline to finalize these Revised 2010 Commitments. However, the obligations to reduce diesel PM emissions by specified percentages starting in 2011 remain unchanged, including the 85 percent emission reduction by 2020.

### IV. EVALUATION OF POTENTIAL ENVIRONMENTAL IMPACTS

Appendix F is ARB staff's evaluation of the potential environmental impacts of the Revised 2010 Commitments and consideration of potential alternatives. The California Environmental Quality Act (CEQA) and ARB regulations require an analysis to identify any potentially significant adverse environmental impacts of ARB's regulations and projects. ARB has determined that execution and implementation of the proposed Revised 2010 Commitments constitutes a "project" as defined by CEQA. ARB is the lead agency for this project. ARB has prepared the Functional Equivalent Document (FED) in Appendix F in accordance with CEQA and ARB's certified regulatory program.

The objective of the Revised 2010 Commitments is to improve air quality by reducing the emissions of diesel PM from operations at each of the four high priority railyards beyond the benefits of the existing program. The railroads will accelerate the use of cleaner technology, possibly in combination with operational improvements, to achieve the required emission reductions at each railyard.

## **A. Environmental Impacts**

The analysis recognizes the beneficial impacts on emissions and health risk. Compared to the existing program in 2020, the Revised 2010 Commitments would cut the remaining cancer risk from diesel PM by an additional 30-70 percent. They would also reduce the number of people exposed to a cancer risk greater than 10 in a million in 2020 by an additional 80-90 percent beyond the existing program in 2020. Just as the Revised 2010 Commitments will reduce the diesel PM emissions and cancer risk at the railyards, they will also reduce the non-cancer health impacts like cardiac and respiratory illness and premature death.

We used the CEQA Environmental Checklist (Appendix F – Attachment 1) of environmental topics to assess the potential for adverse environmental impacts. With this checklist, staff determined that the proposed project will not involve any changes to the environment that could result in any potentially significant impacts on most of the topic areas. However, staff identified three topics for further review and analysis in the Functional Equivalent Document: aesthetics (light/glare), noise, and transportation and traffic.

Virtually all of the potential adverse environmental impacts identified in the Functional Equivalent Document are directly tied to the possibility of railyard operational changes to reduce emissions or exposure. Community members urged ARB to include requirements in the Revised 2010 Commitments for the railroads to consider operational changes, like moving a truck gate to another area within the railyard. Some of these changes could potentially shift the existing noise, light, or traffic impacts of current railyard activities from one set of nearby residents to another set of residents if operations are relocated within the railyard. It is important to note that the railroads may choose or not choose to implement any of these types of operational changes for any number of reasons.

Staff believes there is a small probability of significant impacts that could result from changes in railyard operations, and it is more likely that changes could result in benefits (e.g., increased efficiency, reduced air pollution). However, in view of the uncertainty about future actions that could potentially affect aesthetics (light/glare), noise, and transportation/traffic, staff took a conservative approach and considered these potential impacts to be potentially significant.

## **B. Project Alternatives**

The purpose of the alternatives analysis is to determine whether or not a variation of the proposed project would reduce or eliminate significant project impacts, within the basic framework of the project objectives. In Appendix F, ARB staff analyzes the potential environmental impacts of four alternatives -- Alternative A: "No Project," Alternative B: an ARB regulation for non-preempted locomotives, Alternative C: an ARB regulation for zero-emission cargo handling equipment at intermodal railyards, and Alternative D: an ARB regulation for railroad risk reduction audits, plans, and measures. ARB staff also discusses a number of alternatives considered but rejected as infeasible and not analyzed.

Each of the four alternatives analyzed would not reduce diesel PM emissions at the four priority railyards as effectively as the proposed project. Alternatives A and B would not satisfy the project objective at all (no further reductions in diesel PM at the four priority railyards). Alternatives C and D would be less effective at meeting the project objective and would involve operational changes that share the same potential environmental impacts with the proposed project, without significantly reducing those impacts.

ARB staff concludes that the proposed project provides the best balance of maximizing the diesel PM emission reductions while minimizing the adverse environmental impacts due to possible operational changes to meet the project objectives.

## **C. Public Review and Comment**

Release of this report starts a 45-day public review period for the Functional Equivalent Document from July 5, 2011 to August 19, 2011. The Functional Equivalent Document in Appendix F provides the information about how to submit comments to ARB.

In accordance with ARB's certified regulatory program, staff will respond in writing to all significant environmental issues raised during this comment period and the ARB Executive Officer will consider those comments and responses prior to final action. After the Executive Officer makes a decision on the proposed project, ARB will post the notice of final action and the written responses to comments on ARB's website and file them with the Secretary of the Natural Resources Agency for public inspection.<sup>1</sup>

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<sup>1</sup> Title 17, California Code of Regulations, §60007.

## **V. STEPS TOWARDS A ZERO- OR NEAR-ZERO EMISSION FREIGHT TRANSPORT SYSTEM**

Rail operations are an integral part of a larger freight system and logistics industry in California. The Revised 2010 Commitments, together with existing regulations and agreements, are an important tool to further reduce diesel PM emissions and health risk in communities near the highest risk railyards over the next decade.

Longer-term, we must achieve even greater reductions -- in air toxics to cut the community health risk, in criteria pollutants to meet more health-protective ambient air quality standards, and in greenhouse gases to reduce California's contribution to climate change. To accomplish these objectives, California will need to transition from fossil fuel to cleaner energy sources, including electricity from renewable sources.

Some zero-emission technologies like electric cranes are already available; others like electric drayage and yard trucks are being tested in the field now. While the incremental cost-effectiveness of replacing diesel equipment with 85 percent PM control with electrified equipment is too high to support an ARB regulatory approach today, the railroads may choose to implement this technology in some applications to meet the emission levels in the Revised 2010 Commitments.

ARB is partnering with the South Coast Air Quality Management District to work with the Southern California Association of Governments and stakeholders from the freight industry and affected communities on the longer-term objective -- a more efficient, zero- or near-zero emission freight transport system for Southern California. This initiative is about a coordinated approach to air pollution, energy, transportation, and climate. Our assessment of the potential paths will also need to consider the technical, legal, operational, and financial issues. As the three agencies stated in a recent joint publication:

*"California can build global competitiveness, create jobs, and improve quality of life by creating a world-class freight transportation system for the 21<sup>st</sup> century that uses clean technology to swiftly move goods without pollution."<sup>2</sup>*

Concurrent with this new effort on the freight system as whole, there are other activities to encourage development and deployment of advanced technology at the railyards. As directed by the Board, ARB staff will convene a symposium to explore zero- and near-zero emission technology for locomotive and railyard applications. Under the Revised 2010 Commitments, ARB and the railroads would also agree to work collaboratively to develop and implement a formal demonstration program for advanced technology locomotives or other railyard emission sources.

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<sup>2</sup> South Coast Air Quality Management District, Southern California Association of Governments, and California Air Resources Board, *Powering the Future - A Vision for Clean Energy, Clear Skies, and a Growing Economy in Southern California*. 2011.

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## **Appendix A**

### **Updated Diesel PM Emission and Health Risk Estimates**

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**Appendix A**  
**Updated Diesel PM Emission and Health Risk Estimates**

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## **Updated Diesel PM Emission and Health Risk Estimates**

The June 2010 Staff Report included staff's then-current estimate of the emissions and health risks associated with diesel PM emissions at each of the four priority railyards. Since publication of that report, we have updated the 2010 emissions estimates to reflect actual 2010 cargo activity data, reassessed the potential cargo growth beginning in 2011, and updated our projections of the diesel PM emissions in future years. We also updated the prior estimates of cancer risk and population exposure to diesel PM at each railyard, consistent with the new emission projections. This appendix describes and presents the results of the updated analyses. The diesel PM emissions, cancer risk, and population exposure estimates in this appendix replace and supersede the numbers published in the June 2010 Staff Report. To be consistent with the June 2010 Report, the presentations of the percent change in emissions or risk in this appendix are from the 2005 baseline.

In response to public comments, this appendix also documents the source of the emission inventory numbers for calendar year 2005 used in the June 2010 Staff Report, without modifying those numbers.

This Supplemental Report quantifies the diesel PM emissions from operations at each of the four priority railyards because reducing those emissions and the associated health risk is the purpose of the Revised 2010 Commitments. The actions the railroads would take to implement the Revised 2010 Commitments would provide concurrent reductions in other criteria and toxic air pollutants. ARB staff has not quantified the concurrent reductions in other pollutants because the available, railyard-specific emission inventories were developed for prior Health Risk Assessments and limited to diesel PM.

### **I. DOCUMENTATION OF BASELINE EMISSIONS OF DIESEL PM IN 2005**

The purpose of this section is to more thoroughly document the basis for the 2005 estimates of diesel PM emissions presented in the June 2010 Staff Report and used throughout this Supplemental Report.

In 2005, the ARB entered into a statewide railroad pollution reduction agreement (2005 Agreement) with UP and BNSF; in part, the 2005 Agreement required that Health Risk Assessments (HRAs) be prepared for each of 17 major railyards in the State.<sup>3</sup> Each HRA also included an Emission Inventory (Inventory). In several cases, the original major railyard Inventories or HRAs for 2005 calendar year operations were modified to address changes in ARB emission factors or the calculation of hours of operations for cargo handling equipment, drayage trucks, and transport refrigeration units. These changes were in some cases made early enough to be addressed in the original Inventories or HRAs; in other cases the changes were addressed in subsequent

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<sup>3</sup> ARB/Railroad Statewide Agreement, Particulate Emissions Reduction Program at California Rail Yards, June 2005.

railyard mitigation plans. Ultimately, all of the changes were reflected in the June 2010 Staff Report, *Proposed Actions to Further Reduce Diesel Particulate Matter at High Priority California Railyards*.<sup>4</sup>

The initial and most significant modification was ARB cargo handling equipment load factors. Originally, ARB had identified the cargo handling equipment load factors to be as high as 70 percent for yard trucks or hostlers, based on test data and operations at various port facilities. However, based on manufacturer data and actual operational hour data from cargo handling equipment at UP ICTF/Dolores Railyards and BNSF Hobart Railyard, ARB determined that the load factors were too high for yard hostlers operating at intermodal railyards. With subsequent ARB/UP/BNSF and industry data, UP and BNSF reduced yard truck load factors to about 20 percent. In intermodal railyards, the revised yard truck load factors were incorporated in subsequent Inventories, HRAs, or mitigation plans.

Other significant changes occurred for railyard drayage trucks and transport refrigeration units. Railyard drayage truck emissions increased with use of an updated emissions model, EMFAC2007 Version 2.30,<sup>5</sup> and the changes were reflected in the railyard mitigation plans. Hours of operation for transport refrigeration units were reduced for the railyard mitigation plans based on subsequent field surveys of railyard transport refrigeration operations. All of the railyard Inventories, HRAs, and mitigation plan documents, with explanations of the cargo handling equipment load factor and drayage truck and transport refrigeration unit adjustments, were made available to the public via list serve notices.

The 2005 Inventories and HRAs included emissions from pass-through passenger locomotives. In developing the 2010 Railyard Commitments, ARB agreed to exempt pass-through passenger locomotive diesel PM emissions. ARB and UP and BNSF determined that passenger locomotive operators would be responsible for mitigating passenger locomotive emissions that occurred in the UP and BNSF high-priority railyards from 2010 to 2020.

The following summary tables (Tables A-1 to A-4) show the calendar year 2005 emissions as stated in the Inventory documents, the updated 2005 emission values as presented in the *June 2010 Staff Report*, and the basis for the updates.

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<sup>4</sup> *June 2010 Staff Report*, pp. A1-4, B1-4, C1-4, and D1-4.

<sup>5</sup> EMFAC2007, Version 2.30, [http://www.arb.ca.gov/msei/onroad/downloads/docs/user\\_guide\\_emfac2007.pdf](http://www.arb.ca.gov/msei/onroad/downloads/docs/user_guide_emfac2007.pdf)

**Table A-1**  
**BNSF San Bernardino Railyard**  
**2005 Baseline Emissions of Diesel PM**  
(tons per year)

Equipment Type	Calendar Year 2005		Basis for Change
	Mitigation Plan*	2010 Railyard Commitments**	
Locomotives			Passenger locomotive diesel PM emissions of 0.15 tons per year (tpy) were excluded from railyard emissions in the 2010 Railyard Commitments; passenger locomotive operators are responsible for mitigating these emissions.
- Line Haul	6.0	6.0	
- Switch	4.0	4.0	
- Service/Testing	0.4	0.4	
- Passenger	0.15	0.0	
<i>Subtotal for Locomotives</i>	<i>10.6</i>	<i>10.4</i>	
Cargo Equipment	3.6	3.0	Hours of operations were increased and the ARB load factor was reduced for yard hostlers (see discussion preceding this table)
Drayage Trucks	4.4	5.4	Drayage truck diesel PM emissions increased with use of an updated emissions model, EMFAC2007, Version 2.30 (see discussion preceding this table)
Transport Refrigeration Units	3.3	3.3	
Maintenance/Stationary	0.09	0.1	
<b>Total Tons</b>	<b>22.0</b>	<b>22.2</b>	

\* ENVIRON International, *Draft Diesel Particulate Matter Mitigation Plan for the BNSF Railroad San Bernardino Rail Yard*, August 2008, p. 2.

\*\* June 2010 Staff Report, p. A1-4.

**Table A-2**  
**BNSF Hobart Railyard**  
**2005 Baseline Emissions of Diesel PM**  
(tons per year)

Equipment Type	Calendar Year 2005		Basis for Change
	HRA*	2010 Railyard Commitments**	
Locomotives			Passenger locomotive diesel PM emissions of 0.5 tpy were excluded from railyard emissions in the 2010 Railyard Commitments; passenger locomotive operators are responsible for mitigating these emissions.
- Line Haul	3.2	3.2	
- Switch	2.2	2.2	
- Service/Testing	0.0	0.0	
- Passenger	0.5	0.0	
<i>Subtotal for Locomotives</i>	<i>5.9</i>	<i>5.4</i>	
Cargo Equipment	4.2	5.9	Hours of operations were increased and the ARB load factor was reduced for yard hostlers (see discussion preceding Table A-1)***
Drayage Trucks	10.1	10.7	Drayage truck diesel PM emissions increased with EMFAC2007, Version 2.30 (see discussion preceding Table A-1)***
Transport Refrigeration Units	3.6	2.1	Hours of operation were reduced based on subsequent field equipment surveys***
Maintenance/Stationary	0.1	0.1	
<b>Total Tons</b>	<b>23.9</b>	<b>24.2</b>	

\* Health Risk Assessment for the BNSF Railway Hobart Railyard, November 2007, p. 10.

\*\* June 2010 Staff Report, p. B1-4.

\*\*\* ENVIRON International, *Diesel Particulate Matter Mitigation Plan for the BNSF Railroad Hobart Rail Yard*, September 2008, p. 10.

**Table A-3**  
**UP Commerce Railyard**  
**2005 Baseline Emissions of Diesel PM**  
(tons per year)

Equipment Type	Calendar Year 2005		Basis for Change
	HRA*	2010 Railyard Commitments**	
Locomotives			No changes made
- Line Haul	1.3	1.3	
- Switch	1.9	1.9	
- Service/Testing	1.7	1.7	
- Passenger	-	-	
<i>Subtotal for Locomotives</i>	<i>4.9</i>	<i>4.9</i>	
Cargo Equipment	4.8	4.8	
Drayage Trucks	2.0	2.0	
Transport Refrigeration Units	0.3	0.3	
Maintenance/Stationary/Heavy	0.1	0.1	
<b>Total Tons</b>	<b>12.1</b>	<b>12.1</b>	

\* ARB, *Health Risk Assessment for the Union Pacific Railroad Commerce Railyard*, November 2007, p. 12.

\*\* June 2010 Staff Report, p. C1-4.

**Table A-4**  
**UP ICTF/Dolores Railyards**  
**2005 Baseline Emissions of Diesel PM**  
(tons per year)

Equipment Type	Calendar Year 2005		Basis for Change
	HRA*	2010 Railyard Commitments**	
Locomotives			UP Modernization Plan accounted for 1.8 tpy of Alameda Corridor locomotive emissions generated 0.5 mile outside of the UP ICTF/Dolores Railyards***. These emissions were excluded from the 2005 HRA and 2010 Commitments**
- Line Haul	3.0	1.2	
- Switch	5.6	5.6	
- Service/Testing	1.2	1.2	
- Passenger	0.0	0.0	
<i>Subtotal for Locomotives</i>	<i>9.8</i>	<i>8.0</i>	
Cargo Equipment	4.8	4.8	
Drayage Trucks	7.5	5.9	UP Modernization Plan accounted for 1.6 tpy of drayage truck diesel PM emissions generated 0.5 mile outside of the UP ICTF/Dolores Railyards***. These emissions were excluded from the 2005 HRA and 2010 Commitments**
Transport Refrigeration Units	1.5	1.5	
Maintenance/Stationary	0.06	0.06	
<b>Total Tons</b>	<b>23.7</b>	<b>20.3</b>	

\* ARB, *Health Risk Assessment for the UP Intermodal Container Transfer Facility (ICTF) and Dolores Railyards*, April 2008, p. 10.

\*\* June 2010 Staff Report, p. D1-4.

\*\*\* *Application for Development Project Approval, Intermodal Container Transfer Facility (ICTF) Modernization Project* (December 26, 2007), p. 64.



## II. UPDATED DIESEL PM EMISSIONS FOR 2010 – 2020

In the June 2010 Staff Report, ARB staff developed diesel PM emissions estimates for 2010 through 2020 by applying emission control factors based on existing U.S. EPA and ARB regulations and agreements (i.e., the 1998 Agreement<sup>6</sup> and the 2005 Agreement<sup>7</sup>) to activity held constant at 2005 levels. ARB staff has now updated these emission estimates to reflect reported activity for 2010 and projected growth rates from 2011-2020 for each of the four high-priority railyards.

Section A describes the cargo activity at each yard through 2010 and the basis for the projected growth from 2011-2020. ARB staff looked at activity and operations at each railyard from 2005 through 2010, and estimated an annual growth rate for each railyard from 2011 through 2020.

Section B presents a detailed discussion of the emission control factors for each type of equipment operating at the railyards, reflecting the benefits of adopted regulations, as well as prior agreements between ARB and the railroads.

Finally, in Section C, we present tables for each railyard showing updated estimates of the diesel PM emissions in 2010 and projections for 2015-2020, as well as updated estimates of the excess cancer risk and population exposure. In each case, we show projections for the existing program of adopted regulations and agreements, and the existing program plus the Revised 2010 Commitments.

### A. Basis for Growth Rates

Tables A-5 and A-6 below show the data that staff used on actual operational activity levels from 2005 to 2010, and the basis for estimating future activity levels from 2011 to 2020.

Activity levels for 2005 and 2010 were based on actual container lifts at each of the four high-priority railyards. Over this time period, the number of lifts increased at UP Commerce, but decreased at the other three railyards. Forecasts for 2015 and 2020 are based on various assumed annual average growth rates from actual 2010 lift levels: 5.5 percent for international containers, based on the San Pedro Bay Ports' international container forecast of 5.5 percent average annual growth;<sup>8</sup> 4.1 percent for domestic containers, based on ARB's amended on-road truck and bus rule, which assumed a 4.1 percent average annual growth rate;<sup>9</sup> or a proportionate combination of both.

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<sup>6</sup> ARB, *Memorandum of Mutual Understandings and Agreements, South Coast Locomotive Fleet Average Emission Program*, July 1998.

<sup>7</sup> ARB/Railroad Statewide Agreement, *Particulate Emissions Reduction Program at California Rail Yards*, June 2005.

<sup>8</sup> Tioga Group, Inc., *San Pedro Bay Container Forecast Update*, July 2009, p. 3.

<sup>9</sup> *Emissions Analysis Methodology and Results Medium-Heavy Duty Diesel Trucks, Heavy-Heavy Duty Diesel Trucks, and Regulated Bus Categories*, Proposed Amendments to the Truck and Bus Regulation, the Drayage Truck Regulation and the Tractor-Trailer Greenhouse Gas Regulation, October, 2010. <http://www.arb.ca.gov/regact/2010/truckbus10/truckbus10isor.pdf>

**Table A-5**  
**Four High-Priority Railyards**  
**Container Lift Activities, Forecasts, and Capacities**  
(April 2011)

Railyard	2005 (lifts) Actual	2010 (lifts) Actual	2015 (lifts) Projected	2020 (lifts) Projected	Annual Percent Growth from 2011 to 2020	Railroad Stated Capacity (lifts)
BNSF San Bernardino	555,000 <sup>a</sup>	447,000 <sup>c</sup>	546,000	668,000	4.1	660,000 <sup>e</sup>
% change from 2005	--	-19%	-1.6%	+20%	--	--
BNSF Hobart	1,338,000 <sup>a</sup>	1,090,000 <sup>c</sup>	1,386,000	1,763,000	4.9	1,500,000 <sup>e,f</sup>
% change from 2005	--	-19%	+3.6%	+32%	--	--
UP Commerce	345,000 <sup>b</sup>	429,000 <sup>d</sup>	534,000	664,000	4.4	510,000 <sup>e</sup>
% change from 2005	--	+24%	+55%	+92%	--	--
UP ICTF/Dolores	626,000 <sup>b</sup>	450,000 <sup>d</sup>	587,000	767,000	5.5	760,000 <sup>e</sup>
% change from 2005	--	-28%	-6.2%	+23%	--	--

a. Del Grosso, Robert C., *BNSF Railway Company 2010 Locomotive Review*, p. 9.

b. Union Pacific Fact Book, 2005, p. 9.

c. ARB staff, Harold Holmes, Personal communication with BNSF via email (January 17, 2011).

d. Union Pacific Fact Book, 2010, p. 15.

e. Los Angeles County Metropolitan Transportation Authority, *Technical Memorandum – I-710 Railroads Goods Movement Study*, WBS Task ID:160.10.50, February 2009, pp. 22-24.

f. Based on personal communications between BNSF and Harold Holmes via phone on May 20, 2011, staff determined that 1.5 million of 1.7 million lift capacity was attributed to BNSF Hobart Railyard only, with the balance attributed to BNSF Commerce/Eastern Railyard.

Based on the estimated rates of growth from 2011-2020, staff acknowledges that the projected railyard lift volumes equal or exceed the stated railyard lift capacities by 2020 or earlier. Staff understands that railyard lift capacities can fluctuate slightly or can be adjusted operationally (e.g., higher stacking of containers), at least on a short-term basis. Acknowledging the potential for short-term operational adjustments and the uncertainty in defining the absolute capacity of a railyard, staff chose to be protective of public health by assuming that the forecast rates of growth of container lift volumes would continue, even if the projected lift volumes equaled or exceeded stated railyard lift capacities. The Revised 2010 Commitments would cap future year emissions, regardless of the actual growth experienced.

Table A-6 shows the split between international and domestic containers handled at each yard. This split provided the basis for applying different growth rates to each type of container activity.

**Table A-6**  
**UP and BNSF Intermodal Off-Dock Railyards**  
**In the South Coast Air Basin**  
**International vs. Domestic Containers**

<b>Railyard</b>	<b>International Containers (Port Containers)<sup>a</sup></b>	<b>Domestic Containers (Non-Port / Warehouse / Transloading)<sup>a</sup></b>
BNSF San Bernardino	0%	100%
BNSF Hobart (includes BNSF Commerce/Eastern)	59%	41%
UP Commerce	24%	76%
UP ICTF/Dolores	100%	0%

a. Los Angeles County Metropolitan Transportation Authority, *Technical Memorandum – I-710 Railroads Goods Movement Study*, WBS Task ID: 160.10.50, February 2009, pp. 22-24.

#### **B. Basis for Emission Control Factors**

ARB staff employed a number of resources to estimate diesel PM emission control factors. The emission control factors for the Revised 2010 Commitments are provided below. For switch locomotives, the control factor from the June 2010 Staff Report was increased from 75 percent to 85 percent. Detailed explanations of the bases for all the control factors are provided later in this section. The control factors from Table A-7 are multiplied by the railyard diesel PM emissions, which have been recalculated for the Revised 2010 Commitments to incorporate the annualized growth rates from 2011-2020, to derive the updated railyard diesel PM emission estimates as shown in Tables A-10, A-14, A-18, and A-22.

**Table A-7**  
**Emission Control Factors by Source Category, Relative to 2005 Emissions**  
**(With Existing U.S. EPA and ARB Regulations and Agreements)**

EMISSION SOURCE CATEGORY	2010	2015	2020
<b>Locomotives:</b>			
Line Haul	25% <sup>1</sup>	30% <sup>2</sup>	35% <sup>2</sup>
Switch <sup>3</sup>	85%	85%	85%
Service/Testing	25%	30%	35%
<b>Non-Locomotive:</b>			
Cargo Handling Equipment	50%	80%	90%
Heavy-Duty Diesel Drayage Trucks	80%	85%	90%
Transport Refrigeration Units	50%	70%	90%

<sup>1</sup> In-use emission levels for line haul locomotives in lower power settings (i.e., primarily idle, Notch 1, Notch 2): difference between Tier 0 (assumed 2005 average) and Tier 2 (2010 average, per 1998 Agreement).

<sup>2</sup> In-use emission levels for line haul locomotives in lower power settings (i.e., primarily idle, Notch 1, Notch 2): per U.S. EPA locomotive rulemaking in 2008, 50 percent of Tier 2's remanufactured to Tier 2+/Tier 3 by 2015, with a Tier 3 PM locomotive fleet average achieved by 2020.

<sup>3</sup> Diesel PM emission level of Tier 3 gen-set switch locomotives is about 85 percent lower than the older switch locomotives that they replace (i.e., 0.72 g/bhp-hr in-use to ≤ 0.1 g/bhp-hr PM).

The following discussion presents the basis for the railyard diesel PM emission control factors.

### 1. Locomotive Emissions

In 2005, the average line haul locomotive diesel PM emissions in the eighteen designated railyards were assumed to be approximately equivalent to the Tier 0 in-use PM emission level of about 0.32 g/bhp-hr.<sup>10</sup> The line haul locomotive emission reductions in railyards are estimated at about 25 percent in 2010, 30 percent in 2015, and 35 percent in 2020 based on collected American Association of Railroads in-use emission testing data in the lower power settings (Table A-7 notes).

Table A-8 shows the federal locomotive emission standards in grams of pollutant per brake horsepower-hour (g/bhp-hr) and the associated percent reduction compared to uncontrolled, pre-Tier 0 emission levels, for oxides of nitrogen (NOx), PM, and hydrocarbons (HC). As the railroads replace older locomotives or upgrade the engines in those locomotives to Tier 4 levels to meet the diesel PM levels in the Revised 2010

<sup>10</sup> U.S. EPA Technical Highlights, EPA 420-F-97-051, December 1997.

Commitments, those actions will simultaneously reduce PM, NOx, and HC by about 90 percent over pre-Tier 0 levels.

*a. Line Haul Locomotives*

The 2005 railyard diesel PM Inventories and HRAs assumed a line haul locomotive fleet average roughly equivalent to a Tier 0 emission level. Generally, the baseline assumed that the line haul locomotive fleet was dominated by Tier 0 line haul locomotives (built in 2000 and 2001). The baseline also assumed that pre-Tier 0 locomotives offset emission benefits from newer Tier 1 (built from 2002-2004) and the few new Tier 2 locomotives (production began in 2005) that had begun to penetrate the fleet in 2005.

ARB staff assumed that the line haul locomotive fleet operating in the South Coast Air Basin would be equivalent to a Tier 2 emission level by January 1, 2010, pursuant to the 1998 Locomotive NOx Fleet Average Agreement. In initially reviewing the Inventories, ARB staff assumed that Tier 2 locomotives would provide a 50 percent PM control factor over the baseline (i.e., over a Tier 0 emission level). The 50 percent PM control factor was the difference between the U.S. EPA pre-Tier 0/Tier 0 in-use PM emission level of 0.32 g/bhp-hr and a Tier 2 in-use PM emission level of 0.16 g/bhp-hr. However, these emission levels and the related control factors were calculated over the whole line haul duty cycle.

The line haul locomotive emission standards developed by the U.S. EPA are based on the entire line haul locomotive duty cycle, which assumes a percentage of time in each of a locomotive's 11 settings – i.e., idle (low and normal), dynamic brake and eight power or notch (Notch 1-8) settings.<sup>11</sup> This is significant because diesel fuel consumption rates have a large impact on locomotive emissions, and fuel consumption is greater in the highest power settings (i.e., Notches 5 through 8) than in the lower power settings (i.e., idle and Notches 1 through 4). For example, a line haul locomotive consumes about 5 gallons per hour in the idle setting (the lowest power setting) and about 200 gallons per hour (or more) in Notch 8 (the highest power setting). The duty cycle assumes that a line haul locomotive will be in the idle and dynamic brake settings at about 50 percent of the time, in Notches 1 through 4 at about 23 percent of the time, and in Notches 5 through 8 at about 27 percent of the time. Consequently, to meet the U.S. EPA line haul locomotive standards, line haul locomotives are designed to achieve the greatest amount of emission reductions in the highest power settings (i.e., Notches 5 through 8).

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<sup>11</sup> Title 40, Code of Federal Regulations, Part 92.132, a(ii).

**Table A-8**  
**Federal Locomotive Emission Standards and Percent Control<sup>12,13</sup>**

<b>Line Haul Locomotives</b>							
Emission Tier	Year of Manufacture	NOx		PM		HC	
		Standard (g/bhp-hr)	Percent Control	Standard (g/bhp-hr)	Percent Control	Standard (g/bhp-hr)	Percent Control
Pre-Tier 0	1973-1999	13.5*	n/a	0.6**	n/a	1.0	n/a
Tier 0	2000-2001	9.5	30	0.6	0	1.0	0
Tier 1	2002-2004	7.4	45	0.45	25	0.55	45
Tier 2	2005-2011	5.5	59	0.2	67	0.3	70
Tier 3	2012-2014	5.5	59	0.1	83	0.3	70
Tier 4	2015	1.3	90	0.03	95	0.14	86

<b>Switch Locomotives</b>							
Emission Tier	Year of Manufacture	NOx		PM		HC	
		Standard (g/bhp-hr)	Percent Control	Standard (g/bhp-hr)	Percent Control	Standard (g/bhp-hr)	Percent Control
Pre-Tier 0	1973-1999	17.4*	n/a	0.72**	n/a	2.1	n/a
Tier 0	2000-2001	14.0	20	0.72	0	2.1	0
Tier 1	2002-2004	11.0	37	0.54	25	1.2	43
Tier 2	2005-2011	8.1	53	0.24	67	0.6	71
Tier 3	2012-2014	5.0	71	0.1	86	0.6	71
Tier 4	2015	1.3	93	0.03	96	0.14	93

\* U.S. EPA Locomotive Emissions Standards – Regulatory Support Document – p. 96 – Estimated NOx Emission Rates.

\*\* ARB staff assumed older pre-Tier 0 line haul and switch locomotives would be able to emit up to the Tier 0 PM emission standards, based on American Association of Railroads in-use emission testing ( required to comply with U.S. EPA in-use emission testing requirements)for older switch locomotives with EMD 645 engines.

Based on the Inventories and HRAs, and further discussions with UP and BNSF and locomotive manufacturers, ARB staff determined that line haul locomotives spend nearly all of their operational time within railyards in either idle, Notch 1, or Notch 2. Subsequent U.S. EPA in-use line haul locomotive emission testing determined that Tier 2 line haul locomotives were reducing PM emissions by about 25 percent in the lower line haul power settings, rather than 50 percent over the whole line haul duty cycle. As a result, ARB staff adjusted the level of the PM control factor for line haul locomotives to 25 percent for Tier 2 locomotives – the assumed fleet average in the South Coast Air Basin in 2010.

ARB staff also adjusted the level of PM control factor for Tier 3 locomotives to 35 percent, and the level of PM control factor for Tier 4 locomotives to 45 percent. The

<sup>12</sup> Title 40, Code of Federal Regulations, Part 1033.101, a.

<sup>13</sup> U.S. EPA Fact Sheet EPA-420-F-09-025, April 2009.

Tier 3 and Tier 4 PM control factors are conservative estimates, based largely on the differences between Tier 2 and Tier 0 line haul locomotives in the lower power settings, with some additional small incremental reductions. Staff will revise these numbers as actual emissions testing results become available for new Tier 3 and Tier 4 line haul locomotives. U.S. EPA locomotive regulations (Title 40, Code of Federal Regulations, Part 1033.101) require Tier 3 line haul locomotives to be built beginning in 2012 and Tier 4 line haul locomotives to be built beginning in 2015.

*b. Switch (Yard) Locomotives*

The U.S. EPA switch locomotive duty cycle assumes switch locomotives are in the idle setting about 60 percent of the time, and a significant part of the remaining time in the lower notch settings (Notches 1 through 4). For switch locomotives, the greatest levels of diesel fuel consumption and PM emissions occur in the lower power settings (i.e., the idle setting and Notches 1 through 4). Consequently, to meet the U.S. EPA switch locomotive emissions standards, switch locomotive engines are designed to achieve the greatest proportionate amount of emission reductions in the lower power settings.

The switch locomotive PM control factor in the June 2010 Staff Report compared the U.S. EPA suggested in-use switch locomotive in-use PM emission level of 0.44 g/bhp-hr to the ARB-verified ultra-low switch locomotive PM emission level of 0.1 g/bhp-hr, thereby assuming a reduction of about 75 percent. This control factor was based on a pre-Tier 0/Tier 0 fleet average for switch locomotive operations in the South Coast Air Basin used in the railyard Inventories and HRAs for the 2005 calendar year.

In 1998, U.S. EPA assumed EMD two-stroke switch locomotive in-use PM emission levels to average about 0.44 g/bhp-hr, with reported in-use PM emission levels ranging from 0.22 to 0.86 g/bhp-hr.<sup>14</sup> However, from 2005 to 2009 the American Association of Railroads (AAR) performed U.S. EPA in-use emission testing, which included older EMD switch locomotives (e.g., EMD GP15 and GP/SD38) powered with older EMD 645 engines. These older switch locomotives produced a range of PM emission levels between 0.4 and 0.6 g/bhp-hr. Further, staff recognized that under the U.S. EPA locomotive regulations (Title 40, Code of Federal Regulations, Parts 92 and 1033), any pre-Tier 0 switch locomotive remanufactured to meet the U.S. EPA Tier 0 PM emission standard, was allowed to emit in-use up to 0.72 g/bhp-hr. Therefore, for the Revised 2010 Commitments, staff revised the control factor for switch locomotives: staff compared the U.S. EPA Tier 0 switch locomotive emission standard of 0.72 g/bhp-hr to the ARB-verified ultra-low switch locomotive PM emission level of 0.1 g/bhp-hr, and thus assumed a control factor of 85 percent.

In 2005, the four high-priority railyards were supported primarily by older pre-Tier 0, and a few remanufactured Tier 0 switch locomotives. At the time, Electro-Motive Diesel (EMD) and General Electric (GE), the two largest line haul locomotive manufacturers, had not produced any new switch locomotives since 1987,<sup>15</sup> largely due to the

<sup>14</sup> U.S. EPA Technical Highlights, EPA 420-F-97-051, December 1997.

<sup>15</sup> <http://www.american-rails.com/emd-sw8.html>. Web archive, May 13, 2011.

oversupply of switch locomotives resulting from consolidation and mergers of numerous railroads in the United States in the late 1980's and 1990's.

In 2007 and 2008, UP acquired 61 ARB-verified ultra-low emitting generator set (gen-set) switch locomotives. As a result, both the UP ICTF/Dolores Railyards and the UP Commerce Railyard have been nearly fully supported by gen-set switch locomotives since 2008. In 2010, BNSF acquired 11 gen-set switch locomotives through federal incentive funding, and assigned six gen-set switch locomotives to the BNSF Hobart Railyard, three gen-set switch locomotives to the BNSF San Bernardino Railyard, and two other gen-set switch locomotives to the BNSF Watson Railyard (a smaller railyard near the Ports of Los Angeles and Long Beach). In 2010-2011, BNSF also contracted through federal and State incentive funding programs to assign six more gen-set switch locomotives to the BNSF San Bernardino Railyard by 2012-13. As a result, staff has updated the railyard diesel PM emission estimates to include the gen-set switch locomotives that are currently operating or will be operating in the BNSF San Bernardino Railyard. Staff has also included the railyard diesel PM emission reductions from the six gen-sets currently operating at the BNSF Hobart Railyard. Staff assumes these railyard diesel PM emission reductions will occur by no later than 2015.

*c. Locomotive Service and Testing Emissions*

ARB staff assumed that locomotive service and testing emissions would be dominated by and consistent with the South Coast Air Basin line haul locomotive fleet emissions. As a result, the service and testing operations realize the same levels of diesel PM emissions reductions as the line haul locomotives in Table A-7.

2. Cargo Handling Equipment Emissions

Emission reductions for cargo handling equipment that operated at the four high-priority railyards were largely based on the ARB *Cargo Handling Equipment at Ports and Intermodal Railyards Regulation* (Cargo Handling Equipment Regulation). In developing the cargo handling equipment emission reductions, ARB staff calculated the changes in railyard cargo handling equipment PM emissions from 2005 through 2009, and the total changes to railyard cargo handling equipment PM emissions levels with new equipment (or equipment retrofitted with a diesel particulate filter) from the 2005 baseline through 2020.

Under the ARB Cargo Handling Equipment Regulation, cargo handling equipment operating within these facilities will meet Tier 4 PM emission standards (0.01 g/bhp-hr) and provide a 90 percent or greater reduction in cargo handling equipment PM emissions by 2020. ARB staff analysis of the Cargo Handling Equipment Regulation, railyard Inventory data, and railyard HRA data showed that cargo handling equipment diesel PM emissions at the railyards would be reduced by about 50 percent by 2010, and by about 80 percent by 2015.



ARB staff analysis applied the Cargo Handling Equipment Regulation to equipment counts for 2005 and 2009 at the BNSF San Bernardino Railyard, based on railyard Inventory and HRA data as well as regulatory compliance plans from BNSF. Using this information, along with communications with BNSF, ARB staff analyzed and forecast compliance dates for individual pieces of cargo handling equipment at this railyard. ARB staff's analysis revealed that changes in emissions had already occurred or would occur earlier than forecast by the ARB Cargo Handling Equipment Regulation, and would result in cargo handling equipment PM emission reductions from 2005 levels greater than 90 percent. In 2005 and 2009, the BNSF San Bernardino Railyard had 58 yard hostlers and 13 cranes. Based on ARB staff's analysis, we conclude that every yard hostler, crane, and related cargo handling equipment operating within the railyard will achieve Tier 4 PM emission levels no later than 2015, either by retrofitting older pieces of equipment or replacing them with new ones.

### 3. Heavy Duty Truck Emissions

Emission reductions for heavy-duty diesel drayage trucks that operate within the four high-priority railyards were based on the ARB Drayage Truck regulation. The ARB Drayage Truck regulation mandates that all drayage trucks entering ports and intermodal railyards meet the U.S. EPA 2007 PM emission standard of 0.01 g/bhp-hr for new Class 8 trucks (>33,000 lbs).

ARB staff analysis of the Drayage Truck Regulation, railyard Inventories, and railyard HRAs revealed that drayage truck diesel PM emissions at the four high-priority railyards would be reduced by about 80 percent in 2010, 85 percent in 2015, and 90 percent in 2020. .

Heavy-duty diesel truck and drayage truck emission estimates in the railyard Inventories and HRAs were based on ARB's EMFAC emission model. This model provided fleet composition and emission estimates for truck activity (based on speed and distance) that occurred within each railyard.

### 4. Transport Refrigeration Unit Emissions

Emission reductions for transport refrigeration units (TRUs) operating at the four high-priority railyards were based on the ARB air toxics control measure (ATCM) for TRUs. This ATCM has a phased-in compliance schedule, based on model year. ARB staff analysis of the ATCM for TRUs, railyard Inventories, and railyard HRAs showed that TRU diesel PM emissions at the railyards would be reduced by about 50 percent in 2010 and by about 70 percent in 2015. By 2020, this measure is estimated to provide about a 90 percent or greater reduction in diesel PM emissions from TRU truck and railcar engines in intermodal railyards.

Emission estimates in the railyard Inventories and HRAs were based on ARB's EMFAC emission model. This model provided fleet composition and emission estimates for TRU activity (based on horsepower and time) that occurred within each railyard. Under

the ATCM, every TRU operating in a railyard, under any current or proposed phase-in schedule, must meet a PM emission level of 0.01 g/bhp-hr by 2020.

#### 5. Stationary Compression Ignition Engine and Maintenance of Way Equipment Emissions

ARB staff estimates the stationary sources will continue to contribute a small portion of diesel PM emissions at each of the four high-priority railyards – typically 0.1 ton per year or less.<sup>16</sup> However, most of this equipment has been upgraded since 2005 to U.S. EPA Tier 2 or 3 PM emission standards. Staff estimates that this equipment could be replaced or retrofitted to meet U.S. EPA Tier 4 non-road engines standards by as early as 2020, representing up to a 90 percent or more reduction of PM emissions, for a reduction from 0.1 to 0.01 tons per year.

#### **C. Updated Diesel PM Emissions and Health Risks with the Revised 2010 Commitments**

In this section, staff presents updated tables reflecting projected diesel PM emissions for each of the four high-priority railyards and the additional emission reductions achieved by the Revised 2010 Commitments.

For each of four high-priority railyards, there are three updated tables. The first presents the revised estimates of diesel PM emissions based on actual 2010 cargo activity, projected cargo growth in 2011-2020, and an updated accounting of newly introduced gen-set switch locomotives. The next tables show the corresponding updated cancer risk and population exposed to a risk above 10 in a million at each railyard.

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<sup>16</sup> June 2010 Staff Report, pp. A1-4, B1-4, C1-4, and D1-4.

1. BNSF San Bernardino

**Table A-9**  
**BNSF San Bernardino Railyard**  
**Updated Estimated Diesel PM Emissions by Equipment Type**  
(tons per year)

<b>Equipment Type</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
<b>Emissions with Existing Program Only</b>				
Freight Locomotives				
- Line Haul	6.0	3.6	4.1	4.7
- Switch *	4.0	2.7	0.6	0.7
- Service/Testing	0.4	0.2	0.3	0.3
<i>Subtotal for Locomotives</i>	<i>10.4</i>	<i>6.5</i>	<i>5.0</i>	<i>5.7</i>
Cargo Equipment	3.0	1.2	0.6	0.4
Drayage Trucks	5.4	0.9	0.8	0.7
Transport Refrigeration Units	3.3	1.3	1.0	0.4
Maintenance/Stationary	0.1	0.1	0.1	0.1
<i>Subtotal for Other Equipment</i>	<i>11.8</i>	<i>3.5</i>	<i>2.5</i>	<i>1.6</i>
<b>Total Tons</b>	<b>22.2</b>	<b>10.0</b>	<b>7.5</b>	<b>7.3</b>
Reduction (%) from 2005	N/A	55%	66%	67%
<b>Emissions with Existing Program plus Revised 2010 Commitments</b>				
Additional Emission Reductions with Commitments	N/A	N/A	-0.4	-3.9
<b>Tons Remaining</b>	<b>22.2</b>	<b>10.0</b>	<b>7.1</b>	<b>3.4</b>
Reduction (%) from 2005	N/A	55%	68%	85%
<b>Additional Reduction (%) Attributable to the Commitments in Future Years</b>	<b>N/A</b>	<b>N/A</b>	<b>5%</b>	<b>53%</b>

**Table A-10**  
**BNSF San Bernardino Railyard**  
**Updated Estimated Maximum Individual Cancer Risk**

	<b>Excess Maximum Individual Cancer Risk for 70-Year Exposure*</b> (chances in a million)			
	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Existing Program	2,500	650	510	400
Existing Program + Commitments	N/A	650	500	275
Total Reduction (%) from 2005 Due to Existing Program + Commitments	N/A	74%	80%	89%

\* Estimated cancer risk considers the source and location of the diesel PM emissions within the railyard.

**Table A-11**  
**BNSF San Bernardino Railyard**  
**Updated Estimated Population Exposure to**  
**Excess Cancer Risk Greater than 10 in a Million**

	<b>Number of People Exposed</b>			
	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Existing Program	350,000	187,000	140,000	137,000
Existing Program + Commitments	N/A	187,000	135,000	69,000
Total Reduction (%) from 2005 Due to Existing Program + Commitments	N/A	47%	61%	80%

For BNSF San Bernardino, if you compare the rate of reduction in cancer risk over time (Table A-10) to the rate of reduction in diesel PM emissions (Table A-9), you will notice that risk decreases faster than emissions in the earlier years and slower in the out years. This is because the diesel PM emission sources that achieved substantial reductions by 2010 are also the emission sources with the greatest impact on health risk because of their proximity to nearby residents. The proximity and emission density of the BNSF San Bernardino Railyard truck gate to residents living about 100 feet away led to a highly elevated cancer risk estimate for 2005. By 2010, drayage trucks, cargo handling equipment, and transport refrigeration units had achieved the significant emission reductions required by ARB regulations, triggering a greater than proportional

reduction in health risk. In later years, more of the reductions will come from locomotives that operate further from residents. As a result, locomotives will yield less risk reduction per unit of emission reductions than we saw for drayage trucks.

2. BNSF Hobart

**Table A-12**  
**BNSF Hobart Railyard**  
**Updated Estimated Diesel PM Emissions by Equipment Type**  
(tons per year)

<b>Equipment Type</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
<b>Emissions with Existing Program Only</b>				
Freight Locomotives				
- Line Haul	3.2	2.0	2.3	2.8
- Switch	2.2	1.7	1.0	1.2
- Service/Testing	0	0	0	0
<i>Subtotal for Locomotives</i>	<i>5.4</i>	<i>3.7</i>	<i>3.3</i>	<i>4.0</i>
Cargo Handling Equipment	5.9	2.4	1.2	0.8
Drayage Trucks	10.7	1.7	1.7	1.4
Transport Refrigeration Units	2.1	0.9	0.7	0.3
Maintenance/Stationary	0.1	0.1	0.1	0.1
<i>Subtotal for Other Equipment</i>	<i>18.8</i>	<i>5.1</i>	<i>3.7</i>	<i>2.6</i>
<b>Total Tons</b>	<b>24.2</b>	<b>8.8</b>	<b>7.0</b>	<b>6.6</b>
Reduction (%) from 2005	N/A	64%	71%	73%
<b>Emissions with Existing Program plus Revised 2010 Commitments</b>				
Additional Emission Reductions with Commitments	N/A	N/A	-1.2	-3.0
<b>Tons Remaining</b>	<b>24.2</b>	<b>8.8</b>	<b>5.8</b>	<b>3.6</b>
Reduction (%) from 2005	N/A	64%	76%	85%
<b>Additional Reduction (%) Attributable to the Commitments in Future Years</b>				
	N/A	N/A	17%	45%

**Table A-13**  
**BNSF Hobart Railyard**  
**Updated Estimated Maximum Individual Cancer Risk**

	<b>Excess Maximum Individual Cancer Risk for 70-Year Exposure</b> (chances in a million)			
	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Existing Program	500	180	145	140
Existing Program + Commitments	N/A	180	120	75
Total % Reduction from 2005 Due to Existing Program + Commitments	N/A	64%	76%	85%

**Table A-14**  
**BNSF Hobart Railyard**  
**Updated Estimated Population Exposure to**  
**Excess Cancer Risk Greater than 10 in a Million**

	<b>Number of People Exposed</b>			
	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Existing Program	848,000	281,000	240,000	223,000
Existing Program + Commitments	N/A	281,000	192,000	110,000
Total % Reduction from 2005 Due to Existing Program + Commitments	N/A	67%	77%	87%

### 3. UP Commerce

**Table A-15**  
**UP Commerce Railyard**  
**Updated Estimated Diesel PM Emissions by Equipment Type**  
 (tons per year)

Equipment Type	2005	2010	2015	2020
<b>Emissions with Existing Program Only</b>				
Freight Locomotives				
- Line Haul	1.3	1.2	1.4	1.6
- Switch	1.9	0.4	0.4	0.6
- Service/Testing	1.7	1.6	1.8	2.1
<i>Subtotal for Locomotives</i>	<i>4.9</i>	<i>3.2</i>	<i>3.6</i>	<i>4.3</i>
Cargo Equipment	4.8	3.0	1.5	0.9
Drayage Trucks	2.0	0.5	0.5	0.4
Transport Refrigeration Units	0.3	0.2	0.1	0.03
Maintenance/Stationary	0.1	0.1	0.2	0.2
<i>Subtotal for Other Equipment</i>	<i>7.2</i>	<i>3.8</i>	<i>2.3</i>	<i>1.5</i>
<b>Total Tons</b>	<b>12.1</b>	<b>7.0</b>	<b>5.9</b>	<b>5.8</b>
Reduction (%) from 2005	N/A	42%	51%	52%
<b>Emissions with Existing Program plus Revised 2010 Commitments</b>				
Additional Emission Reductions with Commitments	N/A	N/A	-2.2	-4.0
<b>Tons Remaining</b>	<b>12.1</b>	<b>7.0</b>	<b>3.7</b>	<b>1.8</b>
Reduction (%) from 2005	N/A	42%	69%	85%
<b>Additional Reduction (%) Attributable to the Commitments in Future Years</b>	N/A	N/A	<b>37%</b>	<b>69%</b>

**Table A-16**  
**UP Commerce Railyard**  
**Updated Estimated Maximum Individual Cancer Risk**

	<b>Excess Maximum Individual Cancer Risk for 70-Year Exposure (chances in a million)</b>			
	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Existing Program	500	290	245	240
Existing Program + Commitments	N/A	290	155	75
Total Reduction (%) from 2005 Due to Existing Program+ Commitments	N/A	42%	69%	85%

**Table A-17**  
**UP Commerce Railyard**  
**Updated Estimated Population Exposure to Excess Cancer Risk Greater than 10 in a Million**

	<b>Number of People Exposed</b>			
	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Existing Program	270,000	178,000	140,000	136,000
Existing Program + Commitments	N/A	178,000	67,000	22,000
Total Reduction (%) from 2005 Due to Existing Program+ Commitments	N/A	34%	75%	92%



4. UP ICTF/Dolores

**Table A-18**  
**UP ICTF/Dolores Railyards**  
**Updated Estimated Diesel PM Emissions by Equipment Type**  
 (tons per year)

<b>Equipment Type</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
<b>Emissions with Existing Program Only</b>				
Freight Locomotives				
- Line Haul	1.2	0.6	0.8	1.0
- Switch	5.6	0.6	0.7	1.0
- Service/Testing	1.2	0.6	0.8	0.9
<i>Subtotal for Locomotives</i>	<i>8.0</i>	<i>1.8</i>	<i>2.3</i>	<i>2.9</i>
Cargo Equipment	4.4	1.6	1.0	0.5
Drayage Trucks	5.9	0.8	0.8	0.7
Transport Refrigeration Units	1.5	0.5	0.5	0.3
Diesel Heavy Equipment	0.4	0.2	0.1	0.1
Maintenance/Stationary	0.06	0.04	0.1	0.1
<i>Subtotal for Other Equipment</i>	<i>12.3</i>	<i>3.1</i>	<i>2.5</i>	<i>1.7</i>
<b>Total Tons</b>	<b>20.3</b>	<b>4.9</b>	<b>4.8</b>	<b>4.6</b>
Reduction (%) from 2005	N/A	76%	76%	77%
<b>Emissions with Existing Program plus Revised 2010 Commitments</b>				
Additional Emission Reductions with Commitments	N/A	N/A	0	-1.6
<b>Tons Remaining</b>	<b>20.3</b>	<b>4.9</b>	<b>4.8</b>	<b>3.0</b>
Reduction (%) from 2005	N/A	76%	76%	85%
<b>Additional Reduction (%) Attributable to the Commitments in Future Years</b>	<b>N/A</b>	<b>N/A</b>	<b>0%</b>	<b>35%</b>

**Table A-19**  
**UP ICTF/Dolores Railyards**  
**Updated Estimated Maximum Individual Cancer Risk**

	<b>Excess Maximum Individual Cancer Risk for 70-Year Exposure</b> (chances in a million)			
	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Existing Program	800	190	180	180
Existing Program + Commitments	N/A	190	180	120
Total Reduction (%) from 2005 Due to Existing Program + Commitments	N/A	76%	76%	85%

**Table A-20**  
**UP ICTF/Dolores Railyards**  
**Updated Estimated Population Exposure to**  
**Excess Cancer Risk Greater than 10 in a Million**

	<b>Number of People Exposed</b>			
	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Existing Program	600,000	156,000	143,000	123,000
Existing Program + Commitments	N/A	156,000	143,000	65,500
Total Reduction (%) from 2005 Due to Existing Program + Commitments	N/A	76%	76%	89%

## **APPENDIX B**

### **REVISED 2010 COMMITMENTS FOR THE BNSF SAN BERNARDINO RAILYARD**

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## **Revised 2010 Commitments for BNSF San Bernardino Railyard**

The Air Resources Board (ARB) requests additional commitments from BNSF Railway (BNSF) to further reduce diesel particulate matter (PM) emissions at the BNSF San Bernardino Railyard between 2010 and 2020 (hereinafter referred to as the Revised 2010 Commitments).

If BNSF fails to 1) achieve the Table B-1 diesel PM emission reduction levels in 2011, 2013, 2015, 2017, or 2020; or 2) provide comprehensive or interim diesel PM emission inventories, air dispersion modeling, or emission reduction plans in compliance with the schedule in Table B-2; ARB will initiate rulemakings as specified in Section 9. The commitments, and ARB oversight, will ensure that the BNSF San Bernardino Railyard diesel PM emission reduction levels are achieved, verifiable, and enforceable.

### **Summary of Commitments for the BNSF San Bernardino Railyard**

BNSF commits to do the following at this railyard:

- Reduce 2005 diesel PM emissions from railyard operations by at least 45 percent by 2011, increasing the reductions to at least 85 percent by 2020, with intermediate commitments for emission reductions in calendar years 2013, 2015, and 2017 to ensure steady progress. BNSF is implementing existing U.S. Environmental Protection Agency (U.S. EPA) and ARB regulations and agreements and commits to initiate any additional actions needed to meet the diesel PM emission reduction levels on the stated schedule. This commitment shall be met irrespective of any increase in activity or growth at the BNSF San Bernardino Railyard through 2020, consistent with the provisions of Section 13.
- As of 2005, BNSF had 14 older switch and medium horsepower locomotives assigned to the BNSF San Bernardino Railyard. Between acceptance of this commitment and December 31, 2015, BNSF plans to complete the replacement or repower of existing older switch and medium horsepower locomotives such that all switch and medium horsepower locomotives that operate within the railyard (more than 25 percent of annual hours or 25 percent of annual miles traveled or 25 percent of annual diesel fuel consumption) meet emission levels of 3.0 g/bhp-hr oxides of nitrogen (NO<sub>x</sub>) or less and emissions of 0.1 g/bhp-hr PM or less (over the U.S. EPA line-haul duty cycle).
- By December 31, 2012 and December 31, 2013, evaluate and provide recommendations, if any, for implementation of those changes in railyard operations that BNSF believes may significantly reduce railyard diesel PM emissions, or changes in the location of the railyard emission sources that ARB believes may reduce health risk, and that meet all other specified criteria articulated in Section 6.

- Beginning one month after BNSF's acceptance of these commitments, identify any non-preempted switch or medium horsepower locomotive that operates more than five consecutive calendar days within the railyard and subsequently report this information to ARB with BNSF's annual reports pursuant to the 1998 Locomotive NOx Fleet Average Agreement.
- Prepare and submit railyard diesel PM emission inventories, air dispersion modeling analyses, and emission reduction plans in each year specified in Table B-2.
- Work collaboratively with ARB to provide ongoing communication of railyard diesel PM emission reduction progress to the public through local community meetings and fact sheets.

As part of a broader initiative, BNSF commits to:

- Between 2011 and December 31, 2015, work collaboratively with ARB to develop and implement a formal demonstration program for advanced locomotive engines or aftertreatment devices, or other mutually agreed upon technologies to reduce emissions within the railyard. The objective of the locomotive demonstration program will be to support separate, but potentially parallel, efforts to achieve ARB verification of one or more advanced locomotive engines or aftertreatment devices for ultra-low emitting switch and medium horsepower locomotives to achieve emission levels that are equal to or less than U.S. EPA Tier 4 NOx and/or PM emission standards.
- Make available two existing gen-set switch, medium horsepower, or other locomotives annually through 2015 and provide any necessary technical assistance as BNSF's in-kind contribution to support the demonstration program. If the demonstration program is completed prior to 2015, BNSF's obligation to make these locomotives available would be satisfied as of the completion date.

ARB commits to:

- Install and operate one particulate matter (PM<sub>2.5</sub>) ambient air quality monitor to provide an indication of air quality in the communities near the BNSF San Bernardino Railyard, or to secure a commitment from the South Coast Air Quality Management District to do so, consistent with a siting and operation protocol supported by ARB.
- Prepare periodic health risk assessments (HRAs) as indicated in Table B-3 for the railyard using the comprehensive railyard diesel PM emission inventories and air dispersion modeling analyses submitted by BNSF. Also to prepare periodic estimates of future health risks, through 2020, following BNSF's submittal of draft and final emission reduction plans.

- Review the emission inventories, air dispersion modeling, and emission reduction plans submitted by BNSF to determine the sufficiency of the information provided and notify BNSF of any deficiencies.
- Determine compliance with the diesel PM emission reduction levels for each of the years specified in Table B-1, based on the comprehensive inventories submitted by BNSF and independent ARB verification through inspections, field surveys, and other mechanisms.
- Monitor BNSF's compliance with the commitments in this document, determine if BNSF has met its obligations, and if BNSF has failed to meet the commitments in specified sections, submit rulemakings for locomotives and railyards to the Board within four months from the date of any final determination of non-compliance, as specified in Section 9.
- Support BNSF's efforts to evaluate options for operational changes with technical assistance to evaluate the potential impacts of such changes on health risk for the railyard.

#### **1. What are the commitments to reduce diesel PM emissions?**

BNSF shall meet the diesel PM emission reduction levels at the BNSF San Bernardino Railyard by the specified compliance deadlines as set forth in Table B-1 irrespective of receipt of public incentive funds. BNSF may, however, use incentive funds, if available, to achieve the emission reduction levels. This includes funds under Proposition 1B to replace, repower, or retrofit locomotives. To meet the 85 percent reduction level, ARB staff estimates that the railyard diesel PM emissions of 22.2 tons per year in 2005 will need to be reduced to about 3.4 tons per year by 2020.

Typical emission sources within the railyard affected by the diesel PM emission reduction levels in Table B-1 include interstate line haul locomotives, switch and medium horsepower locomotives, drayage trucks, cargo handling equipment such as cranes and yard hostlers, transport refrigeration units operated with drayage trucks or railcars, and stationary engines and maintenance equipment. Passenger locomotive emissions are excluded from the calculation of railyard diesel PM emissions and reductions used to determine compliance with Table B-1.

**Table B-1. BNSF San Bernardino Railyard  
Diesel PM Emission Reduction Levels and Schedule**

<b>Compliance Deadline</b>	<b>Percent Diesel PM Reductions from 2005 Baseline*</b>	<b>Tons per Year Diesel PM Reductions from 2005 Baseline**</b>
December 31, 2011	45 percent	10.0
December 31, 2013	50 percent	11.1
December 31, 2015	68 percent	15.1
December 31, 2017	73 percent	16.2
December 31, 2020	85 percent	18.8

\* If, after the effective date of this program, ARB reduces the stringency or extends the effective date of ARB regulations affecting non-locomotive diesel PM emission sources at railyards, or U.S. EPA reduces the stringency or extends the effective date of its locomotive PM emission standards, the diesel PM emission reduction levels will be adjusted by ARB accordingly.

\*\* Tons subject to revision if ARB updates the 2005 Baseline number.

ARB staff will use the emissions inventory reported in the 2005 Health Risk Assessment as the 2005 baseline, together with the comprehensive emission inventory submittals for subsequent years, to determine compliance with the Table B-1 emission reduction levels. If ARB revises the *ARB Railyard Emission Inventory Methodology* (2006), ARB staff will recalculate the 2005 Baseline and apply the percent diesel PM reduction listed in Table B-1 to update the associated tons per year of diesel PM reductions required by each compliance deadline. ARB staff will validate the inventory information through a thorough technical review of the data, ongoing ARB railyard inspections, ARB field surveys, and ARB tracking of locomotive and railyard operations.

## **2. Does growth change the commitments to reduce diesel PM emissions?**

No. BNSF commits to reducing diesel PM emissions from the BNSF San Bernardino Railyard by at least 85 percent by 2020 and meeting the intermediate levels in Table B-1, regardless of the potential increases in railyard activity levels, such as the number of container lifts.

## **3. How can BNSF reduce railyard diesel PM emissions 85 percent by 2020?**

ARB's supporting analysis for feasible emission reductions at the BNSF San Bernardino Railyard is located in a separate document entitled, *Basis for Proposed Commitments to Reduce Diesel Particulate Matter at the BNSF San Bernardino Railyard (Basis for Proposed Commitments: June 2010)*. This *Basis for Proposed Commitments* document describes possible options that could be implemented to achieve the Table B-1 diesel PM emission reduction levels.



In 2005, the railyard generated an estimated 22.2 tons per year of diesel PM emissions from freight operations. ARB staff estimates that existing U.S. EPA and ARB regulations and agreements will reduce diesel PM emissions at the railyard down to 7.3 tons per year by 2020 (a 67 percent reduction). ARB staff estimates that BNSF can further cut the railyard diesel PM emissions by 3.9 tons per year by 2020 (achieving an 85 percent reduction compared to 2005 levels).

**4. What are the railroad commitments to prepare and submit emission inventories, air dispersion modeling, and emission reduction plans? What are the ARB commitments to publicly release the railroad documents and health risk assessments?**

Table B-2 shows the schedule for BNSF to submit the railyard diesel PM emission inventories, air dispersion modeling, and draft and final emission reduction plans. Table B-3 identifies the dates by which ARB shall release the railyard diesel PM emission inventories, air dispersion modeling, health risk assessments, and the emission reduction plans for public review.

**Table B-2. BNSF San Bernardino Railyard  
Schedule for BNSF Submittal of Documents: Emission Inventories,  
Air Dispersion Modeling, and Emission Reduction Plans**

<b>Calendar Year</b>	<b>Emission Inventory <sup>a</sup></b>	<b>Air Dispersion Modeling</b>	<b>Draft Emission Reduction Plan</b>	<b>Final Emission Reduction Plan</b>
2010	Dec 31, 2011 (I)	-----	-----	-----
<b>2011</b>	Apr 1, 2012 (C)	Jun 1, 2012	Sep 1, 2012	Dec 31, 2012
2012	Apr 1, 2013 (I)	-----	-----	-----
<b>2013</b>	Apr 1, 2014 (C)	Jun 1, 2014	Sep 1, 2014	Dec 31, 2014
2014	Apr 1, 2015 (I)	-----	-----	-----
<b>2015</b>	Apr 1, 2016 (C)	Jun 1, 2016	Sep 1, 2016	Dec 31, 2016
2016	Apr 1, 2017 (I)	-----	-----	-----
<b>2017</b>	Apr 1, 2018 (C)	Jun 1, 2018	Sep 1, 2018	Dec 31, 2018
2018	Apr 1, 2019 (I)	-----	-----	-----
2019	Apr 1, 2020 (I)	-----	-----	-----
<b>2020</b>	Apr 1, 2021 (C)	-----	-----	-----

<sup>a</sup> (C) = Comprehensive Emission Inventory. (I) = Interim Emission Inventory.

**Table B-3. BNSF San Bernardino Railyard  
Schedule for ARB Release of Documents: Emission Inventories, Air Dispersion  
Modeling, ARB Health Risk Assessments, and Emission Reduction Plans**

<b>Calendar Year</b>	<b>Railroad Emission Inventory <sup>a</sup></b>	<b>Railroad Air Dispersion Modeling</b>	<b>ARB Health Risk Assessment</b>	<b>Railroad Draft Emission Reduction Plan<sup>b</sup></b>	<b>Railroad Final Emission Reduction Plan<sup>b</sup></b>
2010	Jan 15, 2012 (I)	-----	-----	-----	-----
<b>2011</b>	Apr 15, 2012 (C)	Jun 15, 2012	Oct 1, 2012	Oct 1, 2012	Jan 15, 2013
2012	Apr 15, 2013 (I)	-----	-----	-----	-----
<b>2013</b>	Apr 15, 2014 (C)	Jun 15, 2014	Oct 1, 2014	Oct 1, 2014	Jan 15, 2015
2014	Apr 15, 2015 (I)	-----	-----	-----	-----
<b>2015</b>	Apr 15, 2016 (C)	Jun 15, 2016	Oct 1, 2016	Oct 1, 2016	Jan 15, 2017
2016	Apr 15, 2017 (I)	-----	-----	-----	-----
<b>2017</b>	Apr 15, 2018 (C)	Jun 15, 2018	Oct 1, 2018	Oct 1, 2018	Jan 15, 2019
2018	Apr 15, 2019 (I)	-----	-----	-----	-----
2019	Apr 15, 2020 (I)	-----	-----	-----	-----
<b>2020</b>	Apr 15, 2021 (C)	-----	-----	-----	-----

<sup>a</sup> (C) = Comprehensive Emission Inventory. (I) = Interim Emission Inventory.

<sup>b</sup> Following submittal of the draft and final emission reduction plans, ARB staff will provide a brief supplemental document that estimates the associated health risk for future compliance years.

**a. Railyard Diesel PM Emission Inventories**

**i. Comprehensive Diesel PM Emission Inventories**

BNSF commits to prepare the comprehensive diesel PM emission inventories for calendar years 2011, 2013, 2015, 2017, and 2020. BNSF shall prepare each comprehensive diesel PM emission inventory for the railyard in accordance with *ARB Railyard Emission Inventory Methodology* (2006) or its subsequent revisions, using data for the whole of that calendar year. The comprehensive diesel PM emission inventories will include, to the extent reasonably available, detailed activity information such as locomotive event recorder data, hours of operation for cargo handling equipment and transport refrigeration units, and drayage truck time in operation within the railyard. The comprehensive inventory will also identify activity and growth projections through 2020, and the basis for those projections.

## **ii. Interim Diesel PM Emission Inventories**

BNSF commits to prepare interim diesel PM emission inventories for the railyard for calendar years 2010, 2012, 2014, 2016, 2018, and 2019, using data for the whole of the calendar year. The interim emission inventories will identify and utilize updates on locomotive usage, other equipment changes, and activity levels (e.g., number of lifts, drayage truck activities, locomotive shop releases, if applicable) to quantify changes to the last comprehensive diesel PM emission inventory. The interim inventory for calendar year 2010 will quantify changes to the comprehensive 2005 diesel PM emission inventory. ARB staff will use the interim emission inventories to consider if there are any potential issues with BNSF continuing to make sufficient progress in order to meet the railyard diesel PM emission levels specified in Table B-1.

### **b. Air Dispersion Modeling**

BNSF commits to prepare air dispersion modeling based on the schedule in Table B-2. Air dispersion modeling is to be performed in accordance with *ARB Health Risk Assessment Guidance for Railyard and Intermodal Facilities* (2006) or its subsequent revisions. BNSF also commits to provide source apportionment data for receptors defined in the air dispersion model and a source contribution analysis. BNSF also commits to analyze the impacts on the modeled air concentrations from significant updates to the modeling methodology, such as the current version of AERMOD model from U.S. EPA, the availability of updated meteorological data, or any other modeling parameters or inputs which could substantively affect the modeling estimations.

### **c. Health Risk Assessments**

ARB staff commits to prepare health risk assessments using the comprehensive diesel PM emission inventories and air dispersion modeling results. The risk assessments are to be prepared in accordance with *ARB Health Risk Assessment Guidance for Railyard and Intermodal Facilities* (2006) or its subsequent revisions. The updated risk assessments will provide detailed information comparing excess cancer risks and non-cancer health effects with the estimates in the 2005 Health Risk Assessment. ARB staff will compare 2005 railyard emissions and associated health effects with risk assessment results for later years using the same or similar methodology, and also include a separate analysis for any subsequent changes in future year methodologies. ARB staff shall complete the health risk assessment reports for the railyard according to the schedule provided in Table B-3.

Following BNSF's submittal of the draft and final emission reduction plans, ARB also commits to provide a brief supplemental document to the public that estimates the associated health risk for future compliance years. If ARB's health risk estimates for the draft emission reduction plan do not project that health risk will continue to be reduced, ARB shall include that information in its written comments to BNSF on BNSF's draft emission reduction plan.

**d. Emission Reduction Plans**

BNSF commits to submit draft and final emission reduction plans according to the schedule in Table B-2. The emission reduction plans are to be based on the most recent railyard diesel PM emission inventories. The purpose of the plans is for BNSF to detail the actions it will take to reduce railyard emissions down to the levels shown in Table B-1 for the next compliance deadline, and the range of potential actions it intends to pursue for subsequent compliance deadlines. The emission reductions plans will document existing and projected railyard diesel PM emissions through 2020 (accounting for growth), describe changes in source category activities, identify existing and future actions to cut emissions and provide specific implementation schedules for these actions.

**e. ARB Review**

**i. Diesel PM Emission Inventories and Air Dispersion Modeling**

Within 20 calendar days of receipt of a railyard comprehensive or interim diesel PM emission inventory, or air dispersion modeling, ARB shall review the submission for completeness and accuracy and will notify BNSF of its findings. If ARB determines that the submission is not complete and accurate, it will, within the above 20-day time period, notify BNSF in writing of any deficiency and the reasons therefor, and make such written notification publicly available.

Upon receipt of a notice of deficiency from ARB, BNSF will within 15 calendar days correct the deficiencies and resubmit the submission to ARB. Within 10 calendar days, ARB will notify BNSF as to whether the submission is complete and accurate. If not, ARB will make a preliminary determination of non-compliance following the procedures set forth in Section 9.c.ii below.

**ii. Emission Reduction Plans**

Within 30 calendar days of receipt of a draft railyard emission reduction plan, ARB shall review the plan for completeness and accuracy and shall notify BNSF of its findings. If ARB determines that the draft plan is not complete and accurate, or that the draft plan, in the ARB staff's opinion, cannot reasonably achieve the diesel PM reductions required by the next compliance deadline as set forth in Table B-1, ARB shall, within the above 30-day time period, notify BNSF in writing of any deficiency and the reasons therefor, and make such written notification publicly available.

Within 30 calendar days of receipt of the final plan, ARB shall notify BNSF as to whether the plan is complete, accurate, and can reasonably achieve the diesel PM emission reductions required by the next compliance deadline as set forth in Table B-1, and make sure such written notification is publicly available. If not, ARB shall make a preliminary determination of non-compliance as set forth in Section 9.c.ii below. Subsequently, if the administrative appeals panel fully or partially affirms the finding of ARB staff, BNSF

will have 30 calendar days to submit to ARB a revised final plan for the next compliance deadline to cure any deficiencies upheld by the panel. If BNSF fails to submit a revised final plan or if ARB staff determines the revised final plan is still deficient, ARB may immediately commence the rulemaking process outlined in the opening paragraphs of Section 9.

**f. Commitment to Follow Through on Final Emission Reduction Plans**

BNSF shall take the necessary actions identified in the final emission reduction plan in accordance with the plan's implementation schedules to meet the diesel PM emission reduction levels for the next compliance deadline as set forth in Table B-1. If BNSF determines that alternative actions not identified in its most recent plan should be implemented to achieve the emission reduction levels for the next compliance deadline, and the alternative actions materially alter the pathway for achieving the emission reductions in the plan, BNSF will within 15 days of its determination notify ARB of the alternative actions and the reasons for the changes.

**5. What is the commitment for public meetings and outreach?**

BNSF and ARB commit to hold a public meeting no later than December 15 of 2012, 2014, 2016, and 2018, with members of the surrounding community following the release of the most current ARB health risk assessment and BNSF draft emission reduction plan as specified in the Table B-3 schedule. At the public meeting, BNSF and ARB staff will seek public input on the available documents prior to ARB's final determination on the emission reduction plan.

**6. What is the commitment to evaluate options for operational changes?**

BNSF commits to evaluate and provide recommendations, if any, for the implementation of those changes in railyard operations that BNSF believes may significantly reduce railyard diesel PM emissions or changes in the location of the railyard emission sources that ARB believes may reduce health risk. BNSF shall evaluate potential changes at the BNSF San Bernardino Railyard according to the following schedule, including:

- By December 31, 2012:
  - Electric infrastructure to support operation of rail mounted gantry cranes and stationary transport refrigeration units.
- By December 31, 2013:
  - Relocation of the truck gate (assessment has been prepared as part of the BNSF San Bernardino Railyard mitigation plan process in 2008).
  - Relocation of diesel-fueled yard tractors.
  - Relocation and reduction in hours of operation of diesel-fueled transport refrigeration units.

BNSF will conduct this one-time operational review considering, among other things, the potential diesel PM emissions reductions that could be achieved, the technical feasibility of such actions, the operational impacts on the railyard's throughput velocity and fluidity, safety, the availability of land and access, the costs and cost-effectiveness of such actions, and any railyard-specific factors at the BNSF San Bernardino Railyard. Each operational option shall be analyzed, and recommendations, if any, for implementation will be completed as soon as possible for this railyard, but in any case not later than December 31, 2013. BNSF shall provide the assessment and any recommendations for implementation of operational changes to ARB, and ARB will make them publicly available.

ARB commits to support these efforts with technical assistance and to evaluate the impacts of each potential operational change on the maximum individual cancer risk for the railyard. ARB will make the results of this evaluation publicly available.

**7. Will BNSF be able to access incentive funding to support these commitments?**

BNSF, to the extent feasible, will compete for federal, State, local, and private incentive funding to supplement its capital expenditures, and to accelerate further diesel PM and NOx emission reductions at this railyard.

Consistent with State law and Board policies, ARB staff will support efforts by BNSF to seek a mix of federal, State, and local incentive funding to accelerate BNSF's ability to meet the diesel PM emission reduction levels for the railyard.

**8. What are the provisions for BNSF and ARB to meet and confer?**

BNSF agrees to meet and confer with ARB in 2013 regarding the progress being made by locomotive engine manufacturers to produce Tier 4 interstate line haul locomotives and the potential for interstate testing of prototype locomotives to include California.

BNSF agrees to meet and confer with ARB by 2018 to evaluate and explore opportunities for further diesel PM emission reductions by 2020 and beyond.

**9. What are the mechanisms for ARB to enforce these commitments? What would trigger ARB to initiate regulatory action?**

**a. Potential ARB Actions to Enforce the Revised 2010 Commitments**

Upon a final determination of the ARB Executive Officer, or if appealed, of the administrative appeals panel that BNSF has failed to meet its commitments set forth herein at Sections 1, 2, 4, 5, and 6, ARB commits to submit to the Board within four months from the date of the determined failure the following locomotive and railyard rulemakings:

- A regulation of switch and medium horsepower locomotives that are not preempted under federal law (e.g., locomotives that primarily operate in California and that were manufactured prior to 1973 or that exceed 133 percent of their useful life since original manufacture or last remanufacture, whichever is later).
- A designated railyard regulation that requires risk reduction audits and plans to achieve targeted emission reduction levels.

ARB will also consider the following actions:

- Pursue federal legislation to expand ARB authority to adopt regulations for in-use locomotives.
- Petition U.S. EPA to strengthen existing federal locomotive regulations.

ARB is designated as the agency responsible for enforcement of the BNSF commitments. The enforcement authorities specified herein may only be exercised by ARB. BNSF may, at any time, initiate informal consultations with ARB to identify and resolve concerns or other issues regarding compliance with its commitments herein.

In determining whether BNSF has met its commitments, ARB and BNSF (for purposes of this section, individually referred to as “a party” and collectively referred to as “the parties”) agree to the following exclusive process.

#### **b. ARB Verification of Railyard Diesel PM Emission Reduction Levels**

To determine whether BNSF has met the BNSF San Bernardino Railyard diesel PM emission reduction levels specified in Table B-1, ARB will review the comprehensive emission inventories and interim emission inventories in relation to information collected by ARB staff. ARB will conduct semi-annual railyard inspections, which will also be augmented by ARB photographic tracking and field surveys of railyard switch and medium horsepower locomotives. In addition, ARB staff will use the annual BNSF locomotive NOx fleet average agreement submittals to verify the number and tier of interstate line haul locomotives operating within the South Coast Air Basin. ARB staff will also randomly conduct inspections of BNSF interstate line haul locomotives entering and exiting the South Coast Air Basin to help assess compliance with the Table B-1 diesel PM emission reduction levels.

#### **c. Preliminary Determination of Non-Compliance**

##### **i. Failure to Comply with the Railyard Diesel PM Emission Reduction Levels**

Within 30 working days of receipt of the comprehensive railyard diesel PM emission inventories, ARB shall make a written preliminary determination notifying BNSF as to whether BNSF met or failed to meet the diesel PM emission reduction levels specified in

Table B-1 for the previous year. If ARB determines that BNSF has failed to meet its emission reduction levels, ARB shall within the same 30 working days provide BNSF with its written preliminary determination, which will set forth the reasons for its findings. ARB will, with the greatest precision possible based on data submitted by BNSF, calculate the difference between the railyard diesel PM emission reduction level reported by BNSF and the levels required in Table B-1. ARB and BNSF shall use their respective best efforts to expedite submission and review of the reports. The time periods provided for ARB to make a preliminary compliance determination may be extended by written agreement between ARB and BNSF.

Within 15 calendar days of receipt of ARB's preliminary determination that BNSF has failed to meet the emission reduction levels, BNSF may request to meet and confer with ARB and/or provide ARB with such information and analysis as BNSF believes appropriate to demonstrate its compliance with the Table B-1 diesel PM emission reduction levels. If a meet and confer is requested, the parties shall meet within 10 working days of the request. Within 15 calendar days after receipt of BNSF's response or after meeting and conferring with ARB, ARB shall review and consider the information provided by BNSF and make a final determination, in writing, as to whether BNSF has failed to meet the Table B-1 diesel PM emission reduction levels. ARB will make such final written determination publicly available.

For the Table B-1 compliance deadlines in 2011, 2013, 2015, 2017, or 2020, if ARB staff determines that BNSF missed its percentage target for the BNSF San Bernardino Railyard by not more than 2 percent (e.g., reaching a 53 percent compliance level where 55 percent was required), BNSF will be given the opportunity to cure this deficiency by the next calendar year, provided it demonstrates the new compliance level by conducting a full inventory analysis. Failure to conduct the analysis or failure to cure the deficiency in the following calendar year shall constitute a failure to meet the appropriate targets in Table B-1.

## **ii. Failure to Comply with Other Railyard Commitments**

If ARB makes a preliminary determination that BNSF has failed to meet any other of its commitments set forth herein, ARB shall notify BNSF, in writing, of its findings. Within 15 calendar days, BNSF may request to meet and confer with ARB and/or provide ARB with such information and analysis as BNSF believes appropriate to demonstrate its compliance. If a meet and confer is requested, the parties shall meet within 10 working days of the request.

Within 15 calendar days after receipt of BNSF's response or after meeting and conferring with ARB, ARB will review and consider the information provided by BNSF and make a final determination, in writing, as to whether BNSF has failed to meet any of its non-emission reduction-related commitments. ARB will make such final written determination publicly available.



**d. Final Determination by ARB of Non-Compliance**

A final determination of non-compliance shall specifically identify the reasons why ARB has found BNSF not to be in compliance with agreed-upon commitments. A final determination of non-compliance for failure to meet the emission reduction levels set forth in Table B-1 will provide ARB's final calculations of the emission reduction levels of the BNSF San Bernardino Railyard. Findings of BNSF's failure to meet other commitments shall set forth in detail ARB's determination of why the commitments have not been met. ARB will publicly post its final determination notice of non-compliance on its website and make available such notice on a list serve that will be established for notifying the public about compliance with the railyard emission reduction commitments.

**e. Dispute Resolution**

In the event of a dispute concerning an ARB final determination of non-compliance or any dispute arising between ARB and BNSF concerning their respective commitments, the party asserting the dispute shall provide notice to the other party and set forth the issues underlying the dispute. The parties shall meet and confer regarding the identified issues within 15 working days after receipt of notification, and if they cannot reach agreement within 15 working days after such consultation, shall submit their respective positions to an administrative appeals panel, which shall consider the matter as expeditiously as possible. Except for confidential trade secret information, ARB will publicly post on its website and make available by the aforementioned list serve all documents submitted by the parties to the administrative hearing panel. ARB will also post and make available a notice that interested persons may submit written statements of position and supporting documentation to the administrative appeals panel that will be made part of the record of the hearing.

**i. Composition of Administrative Appeals Panel**

The panel shall be comprised of one member selected by ARB, one member selected by BNSF, and a third member selected by the initial two members from a list of five or more persons that the parties shall agree to within 120 calendar days of their exchange of commitment letters. The list shall include persons qualified to hear matters that are likely to be heard by the dispute resolution panel. From the list of five or more persons, the parties shall select the person most readily available to hear the matter within 30 calendar days (or as soon thereafter as possible) from the date that the person is contacted by either the ARB or BNSF panel member. If no person from the previously selected list is available to hear the matter within 45 calendar days of being notified, the ARB and BNSF panel members shall contact an arbitration referral service, identify the matter(s) at issue and accept from the service a list of five persons who are qualified to hear the matter(s) at issue and are readily available. The two panel members selected by the parties may mutually agree on one of the five persons to serve on the panel, but if they cannot agree, each panel member will alternatively strike one person from the list until just one person remains. The two panel members selected by the parties will serve as technical advisors to the third panel member, who shall serve as the presiding

member of the panel and who shall be solely responsible for making the final decision on behalf of the panel.

**ii. Administrative Appeals Panel Process**

Unless otherwise determined that the matter(s) at issue require oral testimony, the panel shall make its decision based upon the written submissions of ARB and BNSF and any written statements submitted by interested persons (see below). If a hearing to take testimony is determined to be necessary, the hearing shall be public. The panel shall determine the time and place of the hearing, and will set forth the procedures to be followed at the hearing. The panel will take all precautions necessary to preserve the confidentiality of trade secret or other confidential information, and will consider such evidence in a closed meeting.

**iii. Public Comments to Administrative Appeals Panel**

Interested persons may submit written statements and supporting documentation to the panel regarding the matter(s) at issue before the matter(s) are taken under submission, however, only ARB and BNSF shall be parties to the dispute resolution process.

**iv. Final Decision by Administrative Appeals Panel**

The panel presiding member shall issue his or her final decision on behalf of the panel within 30 calendar days from the date that the matter is submitted to the panel. While either party receiving an adverse decision from the panel may seek expedited review of the decision in the Superior Court for the County of Sacramento, if the panel's decision upholds the Executive Officer's final determination of non-compliance, ARB may immediately commence the rulemaking process outlined in the opening paragraphs of this section. If judicial review is not sought, then the decision of the panel will be binding on ARB and BNSF, as well as any interested person or Intended Beneficiary of the Revised 2010 Commitments (see below).

**v. Costs and Fees**

Each party to the proceedings outlined above will bear its own costs and fees, with the exception that the parties agree to split all costs and fees arising from the employment of the third panel member.

**10. What are the rights of residents near railyards to enforce ARB's Revised 2010 Commitments?**

**a. Rights of Persons Other Than ARB and BNSF**

Residents living within two miles of the BNSF San Bernardino Railyard are the intended beneficiaries (Intended Beneficiaries) of these Revised 2010 Commitments and are entitled to bring an action in mandamus in the Superior Court of Sacramento against ARB to ensure that ARB meets its commitments under the Revised 2010 Commitments.

The Intended Beneficiaries will be bound by the outcomes of all dispute resolution processes engaged in by ARB and BNSF. If BNSF fails to meet its commitments under the Revised 2010 Commitments, only ARB has the right to exercise the provisions of Section 9, which are the exclusive remedies provided under the Revised 2010 Commitments for non-compliance by BNSF. Except as provided in Section 10, the Revised 2010 Commitments do not create any new rights, including the right of enforcement, for any person (including Intended Beneficiaries) or entity other than ARB or BNSF.

**b. Notice and Opportunity to Cure**

To provide ARB with an opportunity to cure or otherwise address an alleged failure by ARB to meet one of its commitments under the Revised 2010 Commitments, Intended Beneficiaries shall provide ARB with at least 45 days written notice of its intent to seek an order of mandamus from the Superior Court of Sacramento. The notice shall identify the alleged failure, the harm caused by the alleged failure, and the factual basis supporting the allegation. If ARB receives such a notice, ARB shall forward a complete copy to BNSF and Union Pacific Railroad (UP) within five working days and shall within a reasonable period of time thereafter notify BNSF, UP, and the Intended Beneficiaries who provided ARB with notice of the pending action as to whether ARB has been able to cure (or is in the process of curing) the alleged failure or whether the alleged failure is incurable in ARB's view.

If ARB fails to cure or to take reasonable steps towards promptly curing the alleged failure within 45 days after receiving notice, the Intended Beneficiaries may proceed to file above-referenced mandamus action in the Superior Court of Sacramento.

**11. How will BNSF handle the disposition of any pre-Tier 0 locomotive formerly based in the BNSF San Bernardino Railyard?**

BNSF shall not reassign any pre-Tier 0 locomotive formerly based in the BNSF San Bernardino Railyard to another railyard in California.

**12. What are the requirements if BNSF is considering withdrawal from these Revised 2010 Commitments?**

The parties are pledged to successful implementation of the Revised 2010 Commitments. BNSF will meet and confer with ARB prior to any action to withdraw from these Revised 2010 Commitments. BNSF and ARB may mutually elect to amend the Revised 2010 Commitments to withdraw or modify specific provisions. If a reasonable resolution cannot be achieved, BNSF may withdraw from the Revised 2010 Commitments as specifically provided below.

**a. ARB Action Prior to Meeting the Requirements of Section 9**

If ARB proceeds with the rulemakings or other actions identified in Section 9.a. prior to a final determination of BNSF non-compliance with the Revised 2010 Commitments, BNSF may withdraw from these Commitments.

**b. Other Reasons**

If either of the following actions occurs, BNSF may also withdraw from the Revised 2010 Commitments, but BNSF shall continue to comply with Section 13 to maintain progress through December 31, 2020:

- ARB invokes its remedies under Section 9.a. according to the process prescribed in Section 9.
- An agency of the federal government, the State of California (other than ARB), or a local subdivision of the State of California enacts, mandates, or requires BNSF to perform an action at the BNSF San Bernardino Railyard or affecting this railyard that is identical or substantially similar to actions required to meet these Revised 2010 Commitments. However, actions taken by the City of Los Angeles Harbor Department, the City of Long Beach (acting by and through its Board of Harbor Commissioners), or the Intermodal Container Transfer Facility – Joint Powers Authority related to implementation of the San Pedro Bay Ports Clean Air Action Plan or approval of a new railyard or expansion of an existing railyard do not constitute grounds for BNSF to withdraw from these Revised 2010 Commitments.

**13. How will BNSF maintain the progress already made at the BNSF San Bernardino Railyard if BNSF withdraws from these Revised 2010 Commitments?**

BNSF agrees to do all of the following in the event that BNSF withdraws from these Revised 2010 Commitments at the BNSF San Bernardino Railyard for any reason other than that specified in Section 12.a.:

- Through December 31, 2020, substantially maintain the emission reductions required by Table B-1 that were achieved by implementation of these Revised 2010 Commitments at the BNSF San Bernardino Railyard through the last compliance deadline. From the date that Section 13 is triggered, subsequent growth in railroad operations is excluded from this provision.
- Through December 31, 2020, provide a report to ARB for the BNSF San Bernardino Railyard that demonstrates maintenance of progress as described above. BNSF shall provide this report every other year, beginning two years following the date of withdrawal.

**14. What are the general meet and confer provisions?**

In order to assure successful implementation of these Revised 2010 Commitments, BNSF and ARB may at any time meet and confer to review accomplishments, to assess any implementation issues, or to determine if any changes are necessary to improve the overall effectiveness of the Revised 2010 Commitments.

**15. What are the rights of ARB and BNSF notwithstanding these Revised 2010 Commitments?**

Nothing in this agreement precludes ARB from developing regulations within its authority as required to achieve the goals of the State Implementation Plan and Climate Change Scoping Plan.

BNSF is implementing its commitments notwithstanding the preemptive effect of the federal Interstate Commerce Commission Termination Act ("ICCTA"), the Clean Air Act, the Commerce Clause and other federal law. BNSF and ARB recognize that railroads are to a significant degree regulated by federal law, and that aspects of State and local authority to regulate railroads, rail operations, and locomotives are preempted. By executing and performing the Revised 2010 Commitments, BNSF and ARB agree that there is no waiver or modification of any aspect of federal preemption or setting of any precedent as to preemption, reservation of rights or voluntary compliance with other commitments, rules or agreements.

If ARB proceeds with the rulemaking or other actions identified in Section 9.a., BNSF reserves all legal and procedural rights to contest said rulemakings or actions.

**16. What constitutes the full understanding of the Parties?**

This document constitutes the full understanding and agreement of ARB and BNSF with respect to the BNSF San Bernardino Railyard regarding the subject matter of the Revised 2010 Commitments. ARB and BNSF have voluntarily entered into the Revised 2010 Commitments, and nothing in the Revised 2010 Commitments affects the scope of ARB's regulatory authority or the scope of preemption under federal law. ARB and BNSF agree that no amendment to the Revised 2010 Commitments shall be binding unless in writing and signed by authorized representatives of ARB and BNSF.

These Revised 2010 Commitments do not revoke, reduce, amend, or modify the undertakings of BNSF in any previous agreements which remain in effect on the date of this document.

**17. What are the effective dates of these Revised 2010 Commitments?**

These Revised 2010 Commitments shall take effect upon execution by both parties and remain in effect until December 31, 2020 unless amended by ARB and BNSF.

*IN WITNESS WHEREOF, the parties have executed  
these Revised 2010 Commitments.*

CALIFORNIA AIR RESOURCES BOARD,  
an agency of the State of California

THE BNSF RAILWAY COMPANY, a  
Delaware corporation

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James N. Goldstene  
Executive Officer

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Greg C. Fox  
Executive Vice President, Operations

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Date

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Date

Address for notice:  
1001 "I" Street  
P.O. Box 2815  
Sacramento, CA 95812

Address for notice:  
2650 Lou Menk Drive, Second Floor  
Fort Worth, TX 76131-2830

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## **APPENDIX C**

### **REVISED 2010 COMMITMENTS FOR THE BNSF HOBART RAILYARD**

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## **Revised 2010 Commitments for BNSF Hobart Railyard**

The Air Resources Board (ARB) requests additional commitments from BNSF Railway (BNSF) to further reduce diesel particulate matter (PM) emissions at the BNSF Hobart Railyard between 2010 and 2020 (hereinafter referred to as the Revised 2010 Commitments).

If BNSF fails to 1) achieve the Table C-1 diesel PM emission reduction levels in 2011, 2013, 2015, 2017, or 2020; or 2) provide comprehensive or interim diesel PM emission inventories, air dispersion modeling, or emission reduction plans in compliance with the schedule in Table C-2; ARB will initiate rulemakings as specified in Section 9. The commitments, and ARB oversight, will ensure that the BNSF Hobart Railyard diesel PM emission reduction levels are achieved, verifiable, and enforceable.

### **Summary of Commitments for the BNSF Hobart Railyard**

BNSF commits to do the following at this railyard:

- Reduce 2005 diesel PM emissions from railyard operations by at least 55 percent by 2011, increasing the reductions to at least 85 percent by 2020, with intermediate commitments for emission reductions in calendar years 2013, 2015, and 2017 to ensure steady progress. BNSF is implementing existing U.S. Environmental Protection Agency (U.S. EPA) and ARB regulations and agreements and commits to initiate any additional actions needed to meet the diesel PM emission reduction levels on the stated schedule. This commitment shall be met irrespective of any increase in activity or growth at the BNSF Hobart Railyard through 2020, consistent with the provisions of Section 13.
- As of 2005, BNSF had 18 older switch and medium horsepower locomotives assigned to the BNSF Hobart Railyard. Between acceptance of this commitment and December 31, 2015, BNSF plans to complete the replacement or repower of existing older switch and medium horsepower locomotives such that all switch and medium horsepower locomotives that operate within the railyard (more than 25 percent of annual hours or 25 percent of annual miles traveled or 25 percent of annual diesel fuel consumption) meet emission levels of 3.0 g/bhp-hr oxides of nitrogen (NO<sub>x</sub>) or less and emissions of 0.1 g/bhp-hr PM or less (over the U.S. EPA line haul duty cycle).
- By December 31, 2012 and December 31, 2013, evaluate and provide recommendations, if any, for implementation of those changes in railyard operations that BNSF believes may significantly reduce railyard diesel PM emissions or changes in the location of the railyard emission sources that ARB believes may reduce health risk, and that meet all other specified criteria articulated in Section 6.

- Beginning one month after BNSF's acceptance of these commitments, identify any non-preempted switch or medium horsepower locomotive that operates more than five consecutive calendar days within the railyard and subsequently report this information to ARB with BNSF's annual reports pursuant to the 1998 Locomotive NOx Fleet Average Agreement.
- Prepare and submit railyard diesel PM emission inventories, air dispersion modeling analyses, and emission reduction plans in each year specified in Table C-2.
- Work collaboratively with ARB to provide ongoing communication of railyard diesel PM emission reduction progress to the public through local community meetings and fact sheets.

As part of a broader initiative, BNSF commits to:

- Between 2011 and December 31, 2015, work collaboratively with ARB to develop and implement a formal demonstration program for advanced locomotive engines or aftertreatment devices, or other mutually agreed upon technologies to reduce emissions within the railyard. The objective of the locomotive demonstration program will be to support separate, but potentially parallel, efforts to achieve ARB verification of one or more advanced locomotive engines or aftertreatment devices for ultra-low emitting switch and medium horsepower locomotives to achieve emission levels that are equal to or less than U.S. EPA Tier 4 NOx and/or PM emission standards.
- Make available two existing gen-set switch, medium horsepower, or other locomotives annually through 2015 and provide any necessary technical assistance as BNSF's in-kind contribution to support the demonstration program. If the demonstration program is completed prior to 2015, BNSF's obligation to make these locomotives available would be satisfied as of the completion date.

ARB commits to:

- Install and operate one particulate matter (PM<sub>2.5</sub>) ambient air quality monitor to provide an indication of air quality in the communities near the BNSF Hobart and UP Commerce Railyards, or to secure a commitment from the South Coast Air Quality Management District to do so, consistent with a siting and operation protocol supported by ARB.
- Prepare periodic health risk assessments (HRAs) as indicated in Table C-3 for the railyard using the comprehensive railyard diesel PM emission inventories and air dispersion modeling analyses submitted by BNSF. Also to prepare periodic estimates of future health risks, through 2020, following BNSF's submittal of draft and final emission reduction plans.

- Review the emission inventories, air dispersion modeling, and emission reduction plans submitted by BNSF to determine the sufficiency of the information provided and notify BNSF of any deficiencies.
- Determine compliance with the diesel PM emission reduction levels for each of the years specified in Table C-1, based on the comprehensive inventories submitted by BNSF and independent ARB verification through inspections, field surveys, and other mechanisms.
- Monitor BNSF's compliance with the commitments in this document, determine if BNSF has met its obligations, and if BNSF has failed to meet the commitments in specified sections, submit rulemakings for locomotives and railyards to the Board within four months from the date of any final determination of non-compliance, as specified in Section 9.
- Support BNSF's efforts to evaluate options for operational changes with technical assistance to evaluate the potential impacts of such changes on health risk for the railyard.

#### **1. What are the commitments to reduce diesel PM emissions?**

BNSF shall meet the diesel PM emission reduction levels at the BNSF Hobart Railyard by the specified compliance deadlines as set forth in Table C-1 irrespective of receipt of public incentive funds. BNSF may, however, use incentive funds, if available, to achieve the emission reduction levels. This includes funds under Proposition 1B to replace, repower, or retrofit locomotives. To meet the 85 percent reduction level, ARB staff estimates that the railyard diesel PM emissions of 24.2 tons per year in 2005 will need to be reduced to about 3.6 tons per year by 2020.

Typical emission sources within the railyard affected by the diesel PM emission reduction levels in Table C-1 include interstate line haul locomotives, switch and medium horsepower locomotives, drayage trucks, cargo handling equipment such as cranes and yard hostlers, transport refrigeration units operated with drayage trucks or railcars, and stationary engines and maintenance equipment. Passenger locomotive emissions are excluded from the calculation of railyard diesel PM emissions and reductions used to determine compliance with Table C-1.

**Table C-1. BNSF Hobart Railyard  
Diesel PM Emission Reduction Levels and Schedule**

<b>Compliance Deadline</b>	<b>Percent Diesel PM Reductions from 2005 Baseline*</b>	<b>Tons per Year Diesel PM Reductions from 2005 Baseline**</b>
December 31, 2011	55 percent	13.3
December 31, 2013	65 percent	15.7
December 31, 2015	76 percent	18.4
December 31, 2017	78 percent	18.9
December 31, 2020	85 percent	20.6

\* If, after the effective date of this program, ARB reduces the stringency or extends the effective date of ARB regulations affecting non-locomotive diesel PM emission sources at railyards, or U.S. EPA reduces the stringency or extends the effective date of its locomotive PM emission standards, the diesel PM emission reduction levels will be adjusted by ARB accordingly.

\*\* Tons subject to revision if ARB updates the 2005 Baseline number.

ARB staff will use the emissions inventory reported in the 2005 Health Risk Assessment as the 2005 baseline, together with the comprehensive emission inventory submittals for subsequent years, to determine compliance with the Table C-1 emission reduction levels. If ARB revises the *ARB Railyard Emission Inventory Methodology* (2006), ARB staff will recalculate the 2005 Baseline and apply the percent diesel PM reduction listed in Table C-1 to update the associated tons per year of diesel PM reductions required by each compliance deadline. ARB staff will validate the inventory information through a thorough technical review of the data, ongoing ARB railyard inspections, ARB field surveys, and ARB tracking of locomotive and railyard operations.

ARB has acknowledged that BNSF recently shifted all operations at BNSF Commerce Eastern Railyard, which was closed 2008, to the BNSF Hobart Railyard, which resulted in a diesel PM emission increase at the Hobart Railyard. BNSF agrees to absorb all incremental diesel PM emission increases resulting from the Commerce Eastern Railyard operational shift.

## **2. Does growth change the commitments to reduce diesel PM emissions?**

No. BNSF commits to reducing diesel PM emissions from the BNSF Hobart Railyard by at least 85 percent by 2020 and meeting the intermediate levels in Table C-1, regardless of the potential increases in railyard activity levels, such as the number of container lifts.

## **3. How can BNSF reduce railyard diesel PM emissions 85 percent by 2020?**

ARB's supporting analysis for feasible emission reductions at the BNSF Hobart Railyard is located in a separate document entitled, *Basis for Proposed Commitments to Reduce*

*Diesel Particulate Matter at the BNSF Hobart Railyard (Basis for Proposed Commitments: June 2010).* This *Basis for Proposed Commitments* document describes possible options that could be implemented to achieve the Table C-1 diesel PM emission reduction levels.

In 2005, the railyard generated an estimated 24.2 tons per year of diesel PM emissions from freight operations. ARB staff estimates that existing U.S. EPA and ARB regulations and agreements will reduce diesel PM emissions at the railyard down to 6.6 tons per year by 2020 (a 73 percent reduction). ARB staff estimates that BNSF can further cut the railyard diesel PM emissions by 3.0 tons per year by 2020 (achieving an 85 percent reduction compared to 2005 levels).

**4. What are the railroad commitments to prepare and submit emission inventories, air dispersion modeling, and emission reduction plans? What are the ARB commitments to publicly release the railroad documents and health risk assessments?**

Table C-2 shows the schedule for BNSF to submit the railyard diesel PM emission inventories, air dispersion modeling, and draft and final emission reduction plans. Table C-3 identifies the dates by which ARB shall release the railyard diesel PM emission inventories, air dispersion modeling, health risk assessments, and the emission reduction plans for public review.

**Table C-2. BNSF Hobart Railyard  
Schedule for BNSF Submittal of Documents: Emission Inventories,  
Air Dispersion Modeling, and Emission Reduction Plans**

Calendar Year	Emission Inventory <sup>a</sup>	Air Dispersion Modeling	Draft Emission Reduction Plan	Final Emission Reduction Plan
2010	Dec 31, 2011 (I)	-----	-----	-----
<b>2011</b>	Apr 1, 2012 (C)	Jun 1, 2012	Sep 1, 2012	Dec 31, 2012
2012	Apr 1, 2013 (I)	-----	-----	-----
<b>2013</b>	Apr 1, 2014 (C)	Jun 1, 2014	Sep 1, 2014	Dec 31, 2014
2014	Apr 1, 2015 (I)	-----	-----	-----
<b>2015</b>	Apr 1, 2016 (C)	Jun 1, 2016	Sep 1, 2016	Dec 31, 2016
2016	Apr 1, 2017 (I)	-----	-----	-----
<b>2017</b>	Apr 1, 2018 (C)	Jun 1, 2018	Sep 1, 2018	Dec 31, 2018
2018	Apr 1, 2019 (I)	-----	-----	-----
2019	Apr 1, 2020 (I)	-----	-----	-----
<b>2020</b>	Apr 1, 2021 (C)	-----	-----	-----

<sup>a</sup> (C) = Comprehensive Emission Inventory. (I) = Interim Emission Inventory.

**Table C-3. BNSF Hobart Railyard  
Schedule for ARB Release of Documents: Emission Inventories, Air Dispersion  
Modeling, ARB Health Risk Assessments, and Emission Reduction Plans**

<b>Calendar Year</b>	<b>Railroad Emission Inventory<sup>a</sup></b>	<b>Railroad Air Dispersion Modeling</b>	<b>ARB Health Risk Assessment</b>	<b>Railroad Draft Emission Reduction Plan<sup>b</sup></b>	<b>Railroad Final Emission Reduction Plan<sup>b</sup></b>
2010	Jan 15, 2012 (I)	-----	-----	-----	-----
<b>2011</b>	Apr 15, 2012 (C)	Jun 15, 2012	Oct 1, 2012	Oct 1, 2012	Jan 15, 2013
2012	Apr 15, 2013 (I)	-----	-----	-----	-----
<b>2013</b>	Apr 15, 2014 (C)	Jun 15, 2014	Oct 1, 2014	Oct 1, 2014	Jan 15, 2015
2014	Apr 15, 2015 (I)	-----	-----	-----	-----
<b>2015</b>	Apr 15, 2016 (C)	Jun 15, 2016	Oct 1, 2016	Oct 1, 2016	Jan 15, 2017
2016	Apr 15, 2017 (I)	-----	-----	-----	-----
<b>2017</b>	Apr 15, 2018 (C)	Jun 15, 2018	Oct 1, 2018	Oct 1, 2018	Jan 15, 2019
2018	Apr 15, 2019 (I)	-----	-----	-----	-----
2019	Apr 15, 2020 (I)	-----	-----	-----	-----
<b>2020</b>	Apr 15, 2021 (C)	-----	-----	-----	-----

<sup>a</sup> (C) = Comprehensive Emission Inventory. (I) = Interim Emission Inventory.

<sup>b</sup> Following submittal of the draft and final emission reduction plans, ARB staff will provide a brief supplemental document that estimates the associated health risk for future compliance years.

**a. Railyard Diesel PM Emission Inventories**

**i. Comprehensive Diesel PM Emission Inventories**

BNSF commits to prepare the comprehensive diesel PM emission inventories for calendar years 2011, 2013, 2015, 2017, and 2020. BNSF shall prepare each comprehensive diesel PM emission inventory for the railyard in accordance with *ARB Railyard Emission Inventory Methodology* (2006) or its subsequent revisions, using data for the whole of that calendar year. The comprehensive diesel PM emission inventories will include, to the extent reasonably available, detailed activity information such as locomotive event recorder data, hours of operation for cargo handling equipment and transport refrigeration units, and drayage truck time in operation within the railyard. The comprehensive inventory will also identify activity and growth projections through 2020, and the basis for those projections.



## **ii. Interim Diesel PM Emission Inventories**

BNSF commits to prepare interim diesel PM emission inventories for the railyard for calendar years 2010, 2012, 2014, 2016, 2018, and 2019, using data for the whole of the calendar year. The interim emission inventories will identify and utilize updates on locomotive usage, other equipment changes, and activity levels (e.g., number of lifts, drayage truck activities, locomotive shop releases, if applicable) to quantify changes to the last comprehensive diesel PM emission inventory. The interim inventory for calendar year 2010 will quantify changes to the comprehensive 2005 diesel PM emission inventory. ARB staff will use the interim emission inventories to consider if there are any potential issues with BNSF continuing to make sufficient progress in order to meet the railyard diesel PM emission levels specified in Table C-1.

### **b. Air Dispersion Modeling**

BNSF commits to prepare air dispersion modeling based on the schedule in Table C-2. Air dispersion modeling is to be performed in accordance with *ARB Health Risk Assessment Guidance for Railyard and Intermodal Facilities* (2006) or its subsequent revisions. BNSF also commits to provide source apportionment data for receptors defined in the air dispersion model and a source contribution analysis. BNSF also commits to analyze the impacts on the modeled air concentrations from significant updates to the modeling methodology, such as the current version of AERMOD model from U.S. EPA, the availability of updated meteorological data, or any other modeling parameters or inputs which could substantively affect the modeling estimations.

### **c. Health Risk Assessments**

ARB staff commits to prepare health risk assessments using the comprehensive diesel PM emission inventories and air dispersion modeling results. The risk assessments are to be prepared in accordance with *ARB Health Risk Assessment Guidance for Railyard and Intermodal Facilities* (2006) or its subsequent revisions. The updated risk assessments will provide detailed information comparing excess cancer risks and non-cancer health effects with the estimates in the 2005 Health Risk Assessment. ARB staff will compare 2005 railyard emissions and associated health effects with risk assessment results for later years using the same or similar methodology, and also include a separate analysis for any subsequent changes in future year methodologies. ARB staff shall complete the health risk assessment reports for the railyard according to the schedule provided in Table C-3.

Following BNSF's submittal of the draft and final emission reduction plans, ARB also commits to provide a brief supplemental document to the public that estimates the associated health risk for future compliance years. If ARB's health risk estimates for the draft emission reduction plan do not project that health risk will continue to be reduced, ARB shall include that information in its written comments to BNSF on BNSF's draft emission reduction plan.

**d. Emission Reduction Plans**

BNSF commits to submit draft and final emission reduction plans according to the schedule in Table C-2. The emission reduction plans are to be based on the most recent railyard diesel PM emission inventories. The purpose of the plans is for BNSF to detail the actions it will take to reduce railyard emissions down to the levels shown in Table C-1 for the next compliance deadline, and the range of potential actions it intends to pursue for subsequent compliance deadlines. The emission reductions plans will document existing and projected railyard diesel PM emissions through 2020 (accounting for growth), describe changes in source category activities, identify existing and future actions to cut emissions and provide specific implementation schedules for these actions.

**e. ARB Review**

**i. Diesel PM Emission Inventories and Air Dispersion Modeling**

Within 20 calendar days of receipt of a railyard comprehensive or interim diesel PM emission inventory, or air dispersion modeling, ARB shall review the submission for completeness and accuracy and will notify BNSF of its findings. If ARB determines that the submission is not complete and accurate, it will, within the above 20-day time period, notify BNSF in writing of any deficiency and the reasons therefor, and make such written notification publicly available.

Upon receipt of a notice of deficiency from ARB, BNSF will within 15 calendar days correct the deficiencies and resubmit the submission to ARB. Within 10 calendar days, ARB will notify BNSF as to whether the submission is complete and accurate. If not, ARB will make a preliminary determination of non-compliance following the procedures set forth in Section 9.c.ii below.

**ii. Emission Reduction Plans**

Within 30 calendar days of receipt of a draft railyard emission reduction plan, ARB shall review the plan for completeness and accuracy and shall notify BNSF of its findings. If ARB determines that the draft plan is not complete and accurate, or that the draft plan, in the ARB staff's opinion, cannot reasonably achieve the diesel PM reductions required by the next compliance deadline as set forth in Table C-1, ARB shall, within the above 30-day time period, notify BNSF in writing of any deficiency and the reasons therefor, and make such written notification publicly available.

Within 30 calendar days of receipt of the final plan, ARB shall notify BNSF as to whether the plan is complete, accurate, and can reasonably achieve the diesel PM emission reductions required by the next compliance deadline as set forth in Table C-1, and make sure such written notification is publicly available. If not, ARB shall make a preliminary determination of non-compliance as set forth in Section 9.c.ii below. Subsequently, if the administrative appeals panel fully or partially affirms the finding of

ARB staff, BNSF will have 30 calendar days to submit to ARB a revised final plan for the next compliance deadline to cure any deficiencies upheld by the panel. If BNSF fails to submit a revised final plan or if ARB staff determines the revised final plan is still deficient, ARB may immediately commence the rulemaking process outlined in the opening paragraphs of Section 9.

**f. Commitment to Follow Through on Final Emission Reduction Plan**

BNSF shall take the necessary actions identified in the final emission reduction plan in accordance with the plan's implementation schedules to meet the diesel PM emission reduction levels for the next compliance deadline as set forth in Table C-1. If BNSF determines that alternative actions not identified in its most recent plan should be implemented to achieve the emission reduction levels for the next compliance deadline, and the alternative actions materially alter the pathway for achieving the emission reductions in the plan, BNSF will within 15 days of its determination notify ARB of the alternative actions and the reasons for the changes.

**5. What is the commitment for public meetings and outreach?**

BNSF and ARB commit to hold a public meeting no later than December 15 of 2012, 2014, 2016, and 2018, with members of the surrounding community following the release of the most current ARB health risk assessment and BNSF draft emission reduction plan as specified in the Table C-3 schedule. At the public meeting, BNSF and ARB staff will seek public input on the available documents prior to ARB's final determination on the emission reduction plan.

**6. What is the commitment to evaluate options for operational changes?**

BNSF commits to evaluate and provide recommendations, if any, for the implementation of those changes in railyard operations that BNSF believes may significantly reduce railyard diesel PM emissions or changes in the location of the railyard emission sources that ARB believes may reduce health risk. BNSF shall evaluate potential changes at the BNSF Hobart Railyard according to the following schedule, including:

- By December 31, 2012:
  - Relocation of the truck gate; and/or automated gate system, and/or installation of a bridge to provide access for trucks to the railyard.
  - Electric infrastructure to support operation of rail mounted gantry cranes and stationary transport refrigeration units.
- By December 31, 2013:
  - Relocation of diesel-fueled yard tractors and transport refrigeration units.

BNSF will conduct this one-time operational review considering, among other things, the potential diesel PM emissions reductions that could be achieved, the technical feasibility of such actions, the operational impacts on the railyard's throughput velocity and fluidity, safety, the availability of land and access, the costs and cost-effectiveness of such actions, and any railyard-specific factors at the BNSF Hobart Railyard. Each operational option shall be analyzed, and recommendations, if any, for implementation will be completed as soon as possible for this railyard, but in any case not later than December 31, 2013. BNSF shall provide the assessment and any recommendations for implementation of operational changes to ARB, and ARB will make them publicly available.

ARB commits to support these efforts with technical assistance and to evaluate the impacts of each potential operational change on the maximum individual cancer risk for the railyard. ARB will make the results of this evaluation publicly available.

**7. Will BNSF be able to access incentive funding to support these commitments?**

BNSF, to the extent feasible, will compete for federal, State, local, and private incentive funding to supplement its capital expenditures, and to accelerate further diesel PM and NOx emission reductions at this railyard.

Consistent with State law and Board policies, ARB staff will support efforts by BNSF to seek a mix of federal, State, and local incentive funding to accelerate BNSF's ability to meet the diesel PM emission reduction levels for the railyard.

**8. What are the provisions for BNSF and ARB to meet and confer?**

BNSF agrees to meet and confer with ARB in 2013 regarding the progress being made by locomotive engine manufacturers to produce Tier 4 interstate line haul locomotives and the potential for interstate testing of prototype locomotives to include California.

BNSF agrees to meet and confer with ARB by 2018 to evaluate and explore opportunities for further diesel PM emission reductions by 2020 and beyond.

**9. What are the mechanisms for ARB to enforce these commitments? What would trigger ARB to initiate regulatory action?**

**a. Potential ARB Actions to Enforce the Revised 2010 Commitments**

Upon a final determination of the ARB Executive Officer, or if appealed, of the administrative appeals panel that BNSF has failed to meet its commitments set forth herein at Sections 1, 2, 4, 5, and 6, ARB commits to submit to the Board within four months from the date of the determined failure the following locomotive and railyard rulemakings:

- A regulation of switch and medium horsepower locomotives that are not preempted under federal law (e.g., locomotives that primarily operate in California and that were manufactured prior to 1973 or that exceed 133 percent of their useful life since original manufacture or last remanufacture, whichever is later).
- A designated railyard regulation that requires risk reduction audits and plans to achieve targeted emission reduction levels.

ARB will also consider the following actions:

- Pursue federal legislation to expand ARB authority to adopt regulations for in-use locomotives.
- Petition U.S. EPA to strengthen existing federal locomotive regulations.

ARB is designated as the agency responsible for enforcement of the BNSF commitments. The enforcement authorities specified herein may only be exercised by ARB. BNSF may, at any time, initiate informal consultations with ARB to identify and resolve concerns or other issues regarding compliance with its commitments herein.

In determining whether BNSF has met its commitments, ARB and BNSF (for purposes of this section, individually referred to as “a party” and collectively referred to as “the parties”) agree to the following exclusive process.

#### **b. ARB Verification of Railyard Diesel PM Emission Reduction Levels**

To determine whether BNSF has met the BNSF Hobart Railyard diesel PM emission reduction levels specified in Table C-1, ARB will review the comprehensive emission inventories and interim emission inventories in relation to information collected by ARB staff. ARB will conduct semi-annual railyard inspections, which will also be augmented by ARB photographic tracking and field surveys of railyard switch and medium horsepower locomotives. In addition, ARB staff will use the annual BNSF locomotive NOx fleet average agreement submittals to verify the number and tier of interstate line haul locomotives operating within the South Coast Air Basin. ARB staff will also randomly conduct inspections of BNSF interstate line haul locomotives entering and exiting the South Coast Air Basin to help assess compliance with the Table C-1 diesel PM emission reduction levels.

#### **c. Preliminary Determination of Non-Compliance**

##### **i. Failure to Comply with the Railyard Diesel PM Emission Reduction Levels**

Within 30 working days of receipt of the comprehensive railyard diesel PM emission inventories, ARB shall make a written preliminary determination notifying BNSF as to whether BNSF met or failed to meet the diesel PM emission reduction levels specified in

Table C-1 for the previous year. If ARB determines that BNSF has failed to meet its emission reduction levels, ARB shall within the same 30 working days provide BNSF with its written preliminary determination, which will set forth the reasons for its findings. ARB will, with the greatest precision possible based on data submitted by BNSF, calculate the difference between the railyard diesel PM emission reduction level reported by BNSF and the levels required in Table C-1. ARB and BNSF shall use their respective best efforts to expedite submission and review of the reports. The time periods provided for ARB to make a preliminary compliance determination may be extended by written agreement between ARB and BNSF.

Within 15 calendar days of receipt of ARB's preliminary determination that BNSF has failed to meet the emission reduction levels, BNSF may request to meet and confer with ARB and/or provide ARB with such information and analysis as BNSF believes appropriate to demonstrate its compliance with the Table C-1 diesel PM emission reduction levels. If a meet and confer is requested, the parties shall meet within 10 working days of the request. Within 15 calendar days after receipt of BNSF's response or after meeting and conferring with ARB, ARB shall review and consider the information provided by BNSF and make a final determination, in writing, as to whether BNSF has failed to meet the Table C-1 diesel PM emission reduction levels. ARB will make such final written determination publicly available.

For the Table C-1 compliance deadlines in 2011, 2013, 2015, 2017, or 2020, if ARB staff determines that BNSF missed its percentage target for the BNSF Hobart Railyard by not more than 2 percent (e.g., reaching a 63 percent compliance level where 65 percent was required), BNSF will be given the opportunity to cure this deficiency by the next calendar year, provided it demonstrates the new compliance level by conducting a full inventory analysis. Failure to conduct the analysis or failure to cure the deficiency in the following calendar year shall constitute a failure to meet the appropriate targets in Table C-1.

## **ii. Failure to Comply with Other Railyard Commitments**

If ARB makes a preliminary determination that BNSF has failed to meet any other of its commitments set forth herein, ARB shall notify BNSF, in writing, of its findings. Within 15 calendar days, BNSF may request to meet and confer with ARB and/or provide ARB with such information and analysis as BNSF believes appropriate to demonstrate its compliance. If a meet and confer is requested, the parties shall meet within 10 working days of the request.

Within 15 calendar days after receipt of BNSF's response or after meeting and conferring with ARB, ARB will review and consider the information provided by BNSF and make a final determination, in writing, as to whether BNSF has failed to meet any of its non-emission reduction-related commitments. ARB will make such final written determination publicly available.

**d. Final Determination by ARB of Non-Compliance**

A final determination of non-compliance shall specifically identify the reasons why ARB has found BNSF not to be in compliance with agreed-upon commitments. A final determination of non-compliance for failure to meet the emission reduction levels set forth in Table C-1 will provide ARB's final calculations of the emission reduction levels of the BNSF Hobart Railyard. Findings of BNSF's failure to meet other commitments shall set forth in detail ARB's determination of why the commitments have not been met. ARB will publicly post its final determination notice of non-compliance on its website and make available such notice on a list serve that will be established for notifying the public about compliance with the railyard emission reduction commitments.

**e. Dispute Resolution**

In the event of a dispute concerning an ARB final determination of non-compliance or any dispute arising between ARB and BNSF concerning their respective commitments, the party asserting the dispute shall provide notice to the other party and set forth the issues underlying the dispute. The parties shall meet and confer regarding the identified issues within 15 working days after receipt of notification, and if they cannot reach agreement within 15 working days after such consultation, shall submit their respective positions to an administrative appeals panel, which shall consider the matter as expeditiously as possible. Except for confidential trade secret information, ARB will publicly post on its website and make available by the aforementioned list serve all documents submitted by the parties to the administrative hearing panel. ARB will also post and make available a notice that interested persons may submit written statements of position and supporting documentation to the administrative appeals panel that will be made part of the record of the hearing.

**i. Composition of Administrative Appeals Panel**

The panel shall be comprised of one member selected by ARB, one member selected by BNSF, and a third member selected by the initial two members from a list of five or more persons that the parties shall agree to within 120 calendar days of their exchange of commitment letters. The list shall include persons qualified to hear matters that are likely to be heard by the dispute resolution panel. From the list of five or more persons, the parties shall select the person most readily available to hear the matter within 30 calendar days (or as soon thereafter as possible) from the date that the person is contacted by either the ARB or BNSF panel member. If no person from the previously selected list is available to hear the matter within 45 calendar days of being notified, the ARB and BNSF panel members shall contact an arbitration referral service, identify the matter(s) at issue and accept from the service a list of five persons who are qualified to hear the matter(s) at issue and are readily available. The two panel members selected by the parties may mutually agree on one of the five persons to serve on the panel, but if they cannot agree, each panel member will alternatively strike one person from the list until just one person remains. The two panel members selected by the parties will serve as technical advisors to the third panel member, who shall serve as the presiding

member of the panel and who shall be solely responsible for making the final decision on behalf of the panel.

**ii. Administrative Appeals Panel Process**

Unless otherwise determined that the matter(s) at issue require oral testimony, the panel shall make its decision based upon the written submissions of ARB and BNSF and any written statements submitted by interested persons (see below). If a hearing to take testimony is determined to be necessary, the hearing shall be public. The panel shall determine the time and place of the hearing, and will set forth the procedures to be followed at the hearing. The panel will take all precautions necessary to preserve the confidentiality of trade secret or other confidential information, and will consider such evidence in a closed meeting.

**iii. Public Comments to Administrative Appeals Panel**

Interested persons may submit written statements and supporting documentation to the panel regarding the matter(s) at issue before the matter(s) are taken under submission, however, only ARB and BNSF shall be parties to the dispute resolution process.

**iv. Final Decision by Administrative Appeals Panel**

The panel presiding member shall issue his or her final decision on behalf of the panel within 30 calendar days from the date that the matter is submitted to the panel. While either party receiving an adverse decision from the panel may seek expedited review of the decision in the Superior Court for the County of Sacramento, if the panel's decision upholds the Executive Officer's final determination of non-compliance, ARB may immediately commence the rulemaking process outlined in the opening paragraphs of this section. If judicial review is not sought, then the decision of the panel will be binding on ARB and BNSF, as well as any interested person or Intended Beneficiary of the Revised 2010 Commitments (see below).

**v. Costs and Fees**

Each party to the proceedings outlined above will bear its own costs and fees, with the exception that the parties agree to split all costs and fees arising from the employment of the third panel member.



**10. What are the rights of residents near railyards to enforce ARB's Revised 2010 Commitments?**

**a. Rights of Persons Other Than ARB and BNSF**

Residents living within two miles of the BNSF Hobart Railyard are the intended beneficiaries (Intended Beneficiaries) of these Revised 2010 Commitments and are entitled to bring an action in mandamus in the Superior Court of Sacramento against ARB to ensure that ARB meets its commitments under the Revised 2010 Commitments.

The Intended Beneficiaries will be bound by the outcomes of all dispute resolution processes engaged in by ARB and BNSF. If BNSF fails to meet its commitments under the Revised 2010 Commitments, only ARB has the right to exercise the provisions of Section 9, which are the exclusive remedies provided under the Revised 2010 Commitments for non-compliance by BNSF. Except as provided in Section 10, the Revised 2010 Commitments do not create any new rights, including the right of enforcement, for any person (including Intended Beneficiaries) or entity other than ARB or BNSF.

**b. Notice and Opportunity to Cure**

To provide ARB with an opportunity to cure or otherwise address an alleged failure by ARB to meet one of its commitments under the Revised 2010 Commitments, Intended Beneficiaries shall provide ARB with at least 45 days written notice of its intent to seek an order of mandamus from the Superior Court of Sacramento. The notice shall identify the alleged failure, the harm caused by the alleged failure, and the factual basis supporting the allegation. If ARB receives such a notice, ARB shall forward a complete copy to BNSF and Union Pacific Railroad (UP) within five working days and shall within a reasonable period of time thereafter notify BNSF, UP, and the Intended Beneficiaries who provided ARB with notice of the pending action as to whether ARB has been able to cure (or is in the process of curing) the alleged failure or whether the alleged failure is incurable in ARB's view.

If ARB fails to cure or to take reasonable steps towards promptly curing the alleged failure within 45 days after receiving notice, the Intended Beneficiaries may proceed to file above-referenced mandamus action in the Superior Court of Sacramento.

**11. How will BNSF handle the disposition of any pre-Tier 0 locomotive formerly based in the BNSF Hobart Railyard?**

BNSF shall not reassign any pre-Tier 0 locomotive formerly based in the BNSF Hobart Railyard to another railyard in California.

**12. What are the requirements if BNSF is considering withdrawal from these Revised 2010 Commitments?**

The parties are pledged to successful implementation of the Revised 2010 Commitments. BNSF will meet and confer with ARB prior to any action to withdraw from these Revised 2010 Commitments. BNSF and ARB may mutually elect to amend the Revised 2010 Commitments to withdraw or modify specific provisions. If a reasonable resolution cannot be achieved, BNSF may withdraw from the Revised 2010 Commitments as specifically provided below.

**a. ARB Action Prior to Meeting the Requirements of Section 9**

If ARB proceeds with the rulemakings or other actions identified in Section 9.a. prior to a final determination of BNSF non-compliance with the Revised 2010 Commitments, BNSF may withdraw from these Commitments.

**b. Other Reasons**

If either of the following actions occurs, BNSF may also withdraw from the Revised 2010 Commitments, but BNSF shall continue to comply with Section 13 to maintain progress through December 31, 2020:

- ARB invokes its remedies under Section 9.a. according to the process prescribed in Section 9.
- An agency of the federal government, the State of California (other than ARB), or a local subdivision of the State of California enacts, mandates, or requires BNSF to perform an action at the BNSF Hobart Railyard or affecting this railyard that is identical or substantially similar to actions required to meet these Revised 2010 Commitments. However, actions taken by the City of Los Angeles Harbor Department, the City of Long Beach (acting by and through its Board of Harbor Commissioners), or the Intermodal Container Transfer Facility – Joint Powers Authority related to implementation of the San Pedro Bay Ports Clean Air Action Plan or approval of a new railyard or expansion of an existing railyard do not constitute grounds for BNSF to withdraw from these Revised 2010 Commitments.

**13. How will BNSF maintain the progress already made at the BNSF Hobart Railyard if BNSF withdraws from these Revised 2010 Commitments?**

BNSF agrees to do all of the following in the event that BNSF withdraws from these Revised 2010 Commitments at the BNSF Hobart Railyard for any reason other than that specified in Section 12.a.:

- Through December 31, 2020, substantially maintain the emission reductions required by Table C-1 that were achieved by implementation of these Revised 2010 Commitments at the BNSF Hobart Railyard through the last compliance deadline. From the date that Section 13 is triggered, subsequent growth in railroad operations is excluded from this provision.
- Through December 31, 2020, provide a report to ARB for the BNSF Hobart Railyard that demonstrates maintenance of progress as described above. BNSF shall provide this report every other year, beginning two years following the date of withdrawal.

**14. What are the general meet and confer provisions?**

In order to assure successful implementation of these Revised 2010 Commitments, BNSF and ARB may at any time meet and confer to review accomplishments, to assess any implementation issues, or to determine if any changes are necessary to improve the overall effectiveness of the Revised 2010 Commitments.

**15. What are the rights of ARB and BNSF notwithstanding these Revised 2010 Commitments?**

Nothing in this agreement precludes ARB from developing regulations within its authority as required to achieve the goals of the State Implementation Plan and Climate Change Scoping Plan.

BNSF is implementing its commitments notwithstanding the preemptive effect of the federal Interstate Commerce Commission Termination Act ("ICCTA"), the Clean Air Act, the Commerce Clause and other federal law. BNSF and ARB recognize that railroads are to a significant degree regulated by federal law, and that aspects of State and local authority to regulate railroads, rail operations, and locomotives are preempted. By executing and performing the Revised 2010 Commitments, BNSF and ARB agree that there is no waiver or modification of any aspect of federal preemption or setting of any precedent as to preemption, reservation of rights or voluntary compliance with other commitments, rules or agreements.

If ARB proceeds with the rulemaking or other actions identified in Section 9.a., BNSF reserves all legal and procedural rights to contest said rulemakings or actions.

**16. What constitutes the full understanding of the Parties?**

This document constitutes the full understanding and agreement of ARB and BNSF with respect to the BNSF Hobart Railyard regarding the subject matter of the Revised 2010 Commitments. ARB and BNSF have voluntarily entered into the Revised 2010 Commitments, and nothing in the Revised 2010 Commitments affects the scope of ARB's regulatory authority or the scope of preemption under federal law. ARB and BNSF agree that no amendment to the Revised 2010 Commitments shall be binding unless in writing and signed by authorized representatives of ARB and BNSF.

These Revised 2010 Commitments do not revoke, reduce, amend, or modify the undertakings of BNSF in any previous agreements which remain in effect on the date of this document.

**17. What are the effective dates of these Revised 2010 Commitments?**

These Revised 2010 Commitments shall take effect upon execution by both parties and remain in effect until December 31, 2020 unless amended by ARB and BNSF.

*IN WITNESS WHEREOF, the parties have executed  
these Revised 2010 Commitments.*

CALIFORNIA AIR RESOURCES BOARD,  
an agency of the State of California

THE BNSF RAILWAY COMPANY, a  
Delaware corporation

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James N. Goldstene  
Executive Officer

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Greg C. Fox  
Executive Vice President, Operations

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Date

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Date

Address for notice:  
1001 "I" Street  
P.O. Box 2815  
Sacramento, CA 95812

Address for notice:  
2650 Lou Menk Drive, Second Floor  
Fort Worth, TX 76131-2830

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## **APPENDIX D**

### **REVISED 2010 COMMITMENTS FOR THE UP COMMERCE RAILYARD**

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## **Revised 2010 Commitments for the UP Commerce Railyard**

The Air Resources Board (ARB) requests additional commitments from Union Pacific Railroad (UP) to further reduce diesel particulate matter (PM) emissions at the UP Commerce Railyard between 2010 and 2020 (hereinafter referred to as the Revised 2010 Commitments).

If UP fails to 1) achieve the Table D-1 diesel PM emission reduction levels in 2011, 2013, 2015, 2017, or 2020; or 2) provide comprehensive or interim diesel PM emission inventories, air dispersion modeling, or emission reduction plans in compliance with the schedule in Table D-2; ARB will initiate rulemakings as specified in Section 9. The commitments, and ARB oversight, will ensure that the UP Commerce Railyard diesel PM emission reduction levels are achieved, verifiable, and enforceable.

### **Summary of Commitments for the UP Commerce Railyard:**

UP commits to do the following at this railyard:

- Reduce 2005 diesel PM emissions from railyard operations by at least 50 percent by 2011, increasing the reductions to at least 85 percent by 2020, with intermediate commitments for emission reductions in calendar years 2013, 2015, and 2017 to ensure steady progress. UP is implementing existing U.S. Environmental Protection Agency (U.S. EPA) and ARB regulations and agreements and commits to initiate any additional actions needed to meet the diesel PM emission reduction levels on the stated schedule. This commitment shall be met irrespective of any increase in activity or growth at the UP Commerce Railyard through 2020, consistent with the provisions of Section 13.
- Ensure that any additional switch or medium horsepower locomotives that operate within the railyard (more than 25 percent of annual hours or 25 percent of annual miles traveled or 25 percent of annual diesel fuel consumption) meet emission levels of 3.0 g/bhp-hr oxides of nitrogen (NOx) or less and emissions of 0.1 g/bhp-hr PM or less (over the U.S. EPA line-haul duty cycle). UP has already upgraded existing locomotives that operate within the railyard (more than 25 percent of annual hours or 25 percent of annual miles traveled or 25 percent of annual diesel fuel consumption) to meet these emission levels.
- By December 31, 2012 and December 31, 2013, evaluate and provide recommendations, if any, for implementation of those changes in railyard operations that UP believes may significantly reduce railyard diesel PM emissions, or changes in the location of the railyard emission sources that ARB believes may reduce health risk, and that meet all other specified criteria articulated in Section 6.

- Beginning one month after UP's acceptance of these commitments, identify any non-preempted switch or medium horsepower locomotive that operates more than five consecutive calendar days within the railyard and subsequently report this information to ARB with UP's annual reports pursuant to the 1998 Locomotive NOx Fleet Average Agreement.
- Prepare and submit railyard diesel PM emission inventories, air dispersion modeling analyses, and emission reduction plans in each year specified in Table D-2.
- Work collaboratively with ARB to provide ongoing communication of railyard diesel PM emission reduction progress to the public through local community meetings and fact sheets.

As part of a broader initiative, UP commits to:

- Between 2011 and December 31, 2015, work collaboratively with ARB to develop and implement a formal demonstration program for advanced locomotive engines or aftertreatment devices, or other mutually agreed upon technologies to reduce emissions within the railyard. The objective of the locomotive demonstration program will be to support separate, but potentially parallel, efforts to achieve ARB verification of one or more advanced locomotive engines or aftertreatment devices for ultra-low emitting switch and medium horsepower locomotives to achieve emission levels that are equal to or less than U.S. EPA Tier 4 NOx and/or PM emission standards.
- Make available two existing gen-set switch, medium horsepower, or other locomotives annually through 2015 and provide any necessary technical assistance as UP's in-kind contribution to support the demonstration program. If the demonstration program is completed prior to 2015, UP's obligation to make these locomotives available would be satisfied as of the completion date.

ARB commits to:

- Install and operate one particulate matter (PM<sub>2.5</sub>) ambient air quality monitor to provide an indication of air quality in the communities near the UP Commerce and BNSF Hobart Railyards, or to secure a commitment from the South Coast Air Quality Management District to do so, consistent with a siting and operation protocol supported by ARB.
- Prepare periodic health risk assessments (HRAs) as indicated in Table D-3 for the railyard using the comprehensive railyard diesel PM emission inventories and air dispersion modeling analyses submitted by UP. Also to prepare periodic estimates of future health risks, through 2020, following UP's submittal of draft and final emission reduction plans.

- Review the emission inventories, air dispersion modeling, and emission reduction plans submitted by UP to determine the sufficiency of the information provided and notify UP of any deficiencies.
- Determine compliance with the diesel PM emission reduction levels for each of the years specified in Table D-1, based on the comprehensive inventories submitted by UP and independent ARB verification through inspections, field surveys, and other mechanisms.
- Monitor UP's compliance with the commitments in this document, determine if UP has met its obligations, and if UP has failed to meet the commitments in specified sections, submit rulemakings for locomotives and railyards to the Board within four months from the date of any final determination of non-compliance, as specified in Section 9.
- Support UP's efforts to evaluate options for operational changes with technical assistance to evaluate the potential impacts of such changes on health risk for the railyard.

#### **1. What are the commitments to reduce diesel PM emissions?**

UP shall meet the diesel PM emission reduction levels at the UP Commerce Railyard by the specified compliance deadlines set forth in Table D-1 irrespective of receipt of public incentive funds. UP may, however, use incentive funds, if available, to achieve the emission reduction levels. This includes funds under Proposition 1B to replace, repower, or retrofit locomotives. To meet the 85 percent reduction level, ARB staff estimates that the railyard diesel PM emissions of 12.1 tons per year in 2005 will need to be reduced to about 1.8 tons per year by 2020.

Typical emission sources within the railyard affected by the diesel PM emission reduction levels in Table D-1 include interstate line haul locomotives, switch and medium horsepower locomotives, drayage trucks, cargo handling equipment such as cranes and yard hostlers, transport refrigeration units operated with drayage trucks or railcars, and stationary engines and maintenance equipment. Passenger locomotive emissions are excluded from the calculation of railyard diesel PM emissions and reductions used to determine compliance with Table D-1.

**Table D-1. UP Commerce Railyard  
Diesel PM Emission Reduction Levels and Schedule**

<b>Compliance Deadline</b>	<b>Percent Diesel PM Reductions from 2005 Baseline*</b>	<b>Tons per Year Diesel PM Reductions from 2005 Baseline**</b>
December 31, 2011	50 percent	6.1
December 31, 2013	55 percent	6.7
December 31, 2015	69 percent	8.3
December 31, 2017	70 percent	8.5
December 31, 2020	85 percent	10.3

\* If, after the effective date of this program, ARB reduces the stringency or extends the effective date of ARB regulations affecting non-locomotive diesel PM emission sources at railyards, or U.S. EPA reduces the stringency or extends the effective date of its locomotive PM emission standards, the diesel PM emission reduction levels will be adjusted by ARB accordingly.

\*\* Tons subject to revision if ARB updates the 2005 Baseline number.

ARB staff will use the emissions inventory reported in the 2005 Health Risk Assessment as the 2005 baseline, together with the comprehensive emission inventory submittals for subsequent years, to determine compliance with the Table D-1 emission reduction levels. If ARB revises the *ARB Railyard Emission Inventory Methodology* (2006), ARB staff will recalculate the 2005 Baseline and apply the percent diesel PM reduction listed in Table D-1 to update the associated tons per year of diesel PM reductions required by each compliance deadline. ARB staff will validate the inventory information through a thorough technical review of the data, ongoing ARB railyard inspections, ARB field surveys, and ARB tracking of locomotive and railyard operations.

## **2. Does growth change the commitments to reduce diesel PM emissions?**

No. UP commits to reducing diesel PM emissions from the UP Commerce Railyard by at least 85 percent by 2020 and meeting the intermediate levels in Table D-1, regardless of the potential increases in railyard activity levels, such as the number of container lifts.

## **3. How can UP reduce railyard diesel PM emissions 85 percent by 2020?**

ARB's supporting analysis for feasible emission reductions at UP Commerce Railyard is located in a separate document entitled, *Basis for Proposed Commitments to Reduce Diesel Particulate Matter at the UP Commerce Railyard (Basis for Proposed Commitments: June 2010)*. This *Basis for Proposed Commitments* document describes possible options that could be implemented to achieve the Table D-1 diesel PM emission reduction levels.

In 2005, the railyard generated an estimated 12.1 tons per year of diesel PM emissions from freight operations. ARB staff estimates that existing U.S. EPA and ARB

regulations and agreements will reduce diesel PM emissions at the railyard down to 5.8 tons per year by 2020 (a 52 percent reduction). ARB staff estimates that UP can further cut the railyard diesel PM emissions by 4.0 tons per year by 2020 (achieving an 85 percent reduction compared to 2005 levels).

**4. What are the railroad commitments to prepare and submit emission inventories, air dispersion modeling, and emission reduction plans? What are the ARB commitments to publicly release the railroad documents and health risk assessments?**

Table D-2 shows the schedule for UP to submit the railyard diesel PM emission inventories, air dispersion modeling, and draft and final emission reduction plans. Table D-3 identifies the dates by which ARB shall release the railyard diesel PM emission inventories, air dispersion modeling, health risk assessments, and the emission reduction plans for public review.

**Table D-2.**  
**UP Commerce Railyard**  
**Schedule for UP Submittal of Documents: Emission Inventories,**  
**Air Dispersion Modeling, and Emission Reduction Plans**

Calendar Year	Emission Inventory <sup>a</sup>	Air Dispersion Modeling	Draft Emission Reduction Plan	Final Emission Reduction Plan
2010	Dec 31, 2011 (I)	-----	-----	-----
<b>2011</b>	Apr 1, 2012 (C)	Jun 1, 2012	Sep 1, 2012	Dec 31, 2012
2012	Apr 1, 2013 (I)	-----	-----	-----
<b>2013</b>	Apr 1, 2014 (C)	Jun 1, 2014	Sep 1, 2014	Dec 31, 2014
2014	Apr 1, 2015 (I)	-----	-----	-----
<b>2015</b>	Apr 1, 2016 (C)	Jun 1, 2016	Sep 1, 2016	Dec 31, 2016
2016	Apr 1, 2017 (I)	-----	-----	-----
<b>2017</b>	Apr 1, 2018 (C)	Jun 1, 2018	Sep 1, 2018	Dec 31, 2018
2018	Apr 1, 2019 (I)	-----	-----	-----
2019	Apr 1, 2020 (I)	-----	-----	-----
<b>2020</b>	Apr 1, 2021 (C)	-----	-----	-----

<sup>a</sup> (C) = Comprehensive Emission Inventory. (I) = Interim Emission Inventory.

**Table D-3. UP Commerce Railyard  
Schedule for ARB Release of Documents: Emission Inventories, Air Dispersion  
Modeling, ARB Health Risk Assessments and Emission Reduction Plans**

<b>Calendar Year</b>	<b>Railroad Emission Inventory<sup>a</sup></b>	<b>Railroad Air Dispersion Modeling</b>	<b>ARB Health Risk Assessment</b>	<b>Railroad Draft Emission Reduction Plan<sup>b</sup></b>	<b>Railroad Final Emission Reduction Plan<sup>b</sup></b>
2010	Jan 15, 2012 (I)	-----	-----	-----	-----
<b>2011</b>	Apr 15, 2012 (C)	Jun 15, 2012	Oct 1, 2012	Oct 1, 2012	Jan 15, 2013
2012	Apr 15, 2013 (I)	-----	-----	-----	-----
<b>2013</b>	Apr 15, 2014 (C)	Jun 15, 2014	Oct 1, 2014	Oct 1, 2014	Jan 15, 2015
2014	Apr 15, 2015 (I)	-----	-----	-----	-----
<b>2015</b>	Apr 15, 2016 (C)	Jun 15, 2016	Oct 1, 2016	Oct 1, 2016	Jan 15, 2017
2016	Apr 15, 2017 (I)	-----	-----	-----	-----
<b>2017</b>	Apr 15, 2018 (C)	Jun 15, 2018	Oct 1, 2018	Oct 1, 2018	Jan 15, 2019
2018	Apr 15, 2019 (I)	-----	-----	-----	-----
2019	Apr 15, 2020 (I)	-----	-----	-----	-----
<b>2020</b>	Apr 15, 2021 (C)	-----	-----	-----	-----

<sup>a</sup> (C) = Comprehensive Emission Inventory. (I) = Interim Emission Inventory.

<sup>b</sup> Following submittal of the draft and final emission reduction plans, ARB staff will provide a brief supplemental document that estimates the associated health risk for future compliance years.

#### **a. Railyard Diesel PM Emission Inventories**

##### **i. Comprehensive Diesel PM Emission Inventories**

UP commits to prepare the comprehensive diesel PM emission inventories for calendar years 2011, 2013, 2015, 2017, and 2020. UP shall prepare each comprehensive diesel PM emission inventory for the railyard in accordance with *ARB Railyard Emission Inventory Methodology* (2006) or its subsequent revisions, using data for the whole of that calendar year. The comprehensive diesel PM emission inventories will include, to the extent reasonably available, detailed activity information such as locomotive event recorder data, hours of operation for cargo handling equipment and transport refrigeration units, and drayage truck time in operation within the railyard. The comprehensive inventory will also identify activity and growth projections through 2020, and the basis for those projections.

## **ii. Interim Diesel PM Emission Inventories**

UP commits to prepare interim diesel PM emission inventories for the railyard for calendar years 2010, 2012, 2014, 2016, 2018, and 2019, using data for the whole of the calendar year. The interim emission inventories will identify and utilize updates on locomotive usage, other equipment changes, and activity levels (e.g., number of lifts, drayage truck activities, locomotive shop releases, if applicable) to quantify changes to the last comprehensive diesel PM emission inventory. The interim inventory for calendar year 2010 will quantify changes to the comprehensive 2005 diesel PM emission inventory. ARB staff will use the interim emission inventories to consider if there are any potential issues with UP continuing to make sufficient progress in order to meet the railyard diesel PM emission levels specified in Table D-1.

### **b. Air Dispersion Modeling**

UP commits to prepare air dispersion modeling based on the schedule in Table D-2. Air dispersion modeling is to be performed in accordance with *ARB Health Risk Assessment Guidance for Railyard and Intermodal Facilities* (2006) or its subsequent revisions. UP also commits to provide source apportionment data for receptors defined in the air dispersion model and a source contribution analysis. UP also commits to analyze the impacts on the modeled air concentrations from significant updates to the modeling methodology, such as the current version of AERMOD model from U.S. EPA, the availability of updated meteorological data, or any other modeling parameters or inputs which could substantively affect the modeling estimations.

### **c. Health Risk Assessments**

ARB staff commits to prepare health risk assessments using the comprehensive diesel PM emission inventories and air dispersion modeling results. The risk assessments are to be prepared in accordance with *ARB Health Risk Assessment Guidance for Railyard and Intermodal Facilities* (2006) or its subsequent revisions. The updated risk assessments will provide detailed information comparing excess cancer risks and non-cancer health effects with the estimates in the 2005 Health Risk Assessment. ARB staff will compare 2005 railyard emissions and associated health effects with risk assessment results for later years using the same or similar methodology, and also include a separate analysis for any subsequent changes in future year methodologies. ARB staff shall complete the health risk assessment reports for the railyard according to the schedule provided in Table D-3.

Following UP's submittal of the draft and final emission reduction plans, ARB also commits to provide a brief supplemental document to the public that estimates the associated health risk for future compliance years. If ARB's health risk estimates for the draft emission reduction plan do not project that health risk will continue to be reduced, ARB shall include that information in its written comments to UP on UP's draft emission reduction plan.

**d. Emission Reduction Plans**

UP commits to submit draft and final emission reduction plans according to the schedule in Table D-2. The emission reduction plans are to be based on the most recent railyard diesel PM emission inventories. The purpose of the plans is for UP to detail the actions it will take to reduce railyard emissions down to the levels shown in Table D-1 for the next compliance deadline, and the range of potential actions it intends to pursue for subsequent compliance deadlines. The emission reductions plans will document existing and projected railyard diesel PM emissions through 2020 (accounting for growth), describe changes in source category activities, identify existing and future actions to cut emissions and provide specific implementation schedules for these actions.

**e. ARB Review**

**i. Diesel PM Emission Inventories and Air Dispersion Modeling**

Within 20 calendar days of receipt of a railyard comprehensive or interim diesel PM emission inventory, or air dispersion modeling, ARB shall review the submission for completeness and accuracy and will notify UP of its findings. If ARB determines that the submission is not complete and accurate, it will, within the above 20-day time period, notify UP in writing of any deficiency and the reasons therefor, and make such written notification publicly available.

Upon receipt of a notice of deficiency from ARB, UP will within 15 calendar days correct the deficiencies and resubmit the submission to ARB. Within 10 calendar days, ARB will notify UP as to whether the submission is complete and accurate. If not, ARB will make a preliminary determination of non-compliance following the procedures set forth in Section 9.c.ii below.

**ii. Emission Reduction Plans**

Within 30 calendar days of receipt of a draft railyard emission reduction plan, ARB shall review the plan for completeness and accuracy and shall notify UP of its findings. If ARB determines that the draft plan is not complete and accurate, or that the draft plan, in ARB staff's opinion, cannot reasonably achieve the diesel PM reductions required by the next compliance deadline as set forth in Table D-1, ARB shall, within the above 30-day time period, notify UP in writing of any deficiency and the reasons therefor, and make such written notification publicly available.

Within 30 calendar days of receipt of the final plan, ARB shall notify UP as to whether the plan is complete, accurate, and can reasonably achieve the diesel PM emission reductions required by the next compliance deadline as set forth in Table D-1, and make sure such written notification is publicly available. If not, ARB shall make a preliminary determination of non-compliance as set forth in Section 9.c.ii below. Subsequently, if the administrative appeals panel fully or partially affirms the finding of



ARB staff, UP will have 30 calendar days to submit to ARB a revised final plan for the next compliance deadline to cure any deficiencies upheld by the panel. If UP fails to submit a revised final plan or if ARB staff determines the revised final plan is still deficient, ARB may immediately commence the rulemaking process outlined in the opening paragraphs of Section 9.

**f. Commitment to Follow Through on Final Emission Reduction Plan**

UP shall take the necessary actions identified in the final emission reduction plan in accordance with the plan's implementation schedules to meet the diesel PM emission reduction levels for the next compliance deadline as set forth in Table D-1. If UP determines that alternative actions not identified in its most recent plan should be implemented to achieve the emission reduction levels for the next compliance deadline, and the alternative actions materially alter the pathway for achieving the emission reductions in the plan, UP will within 15 days of its determination notify ARB of the alternative actions and the reasons for the changes.

**5. What is the commitment for public meetings and outreach?**

UP and ARB commit to hold a public meeting no later than December 15 of 2012, 2014, 2016, and 2018, with members of the surrounding community following the release of the most current ARB health risk assessment and UP draft emission reduction plan as specified in the Table D-3 schedule. At the public meeting, UP and ARB staff will seek public input on the available documents prior to ARB's final determination on the emission reduction plan.

**6. What is the commitment to evaluate options for operational changes?**

UP commits to evaluate and provide recommendations, if any, for the implementation of those changes in railyard operations that UP believes may significantly reduce railyard diesel PM emissions or changes in the location of the railyard emission sources that ARB believes may reduce health risk. UP shall evaluate potential changes at the UP Commerce Railyard according to the following schedule, including:

- By December 31, 2012:
  - Installation of a stationary collection system to reduce locomotive maintenance and service related emissions.
  - Relocation of diesel-fueled yard tractors.
- By December 31, 2013:
  - Relocation of the locomotive maintenance and service facilities, including associated essential idling emissions.
  - Electric infrastructure to support operation of rail mounted gantry cranes.

UP will conduct this one-time operational review considering, among other things, the potential diesel PM emissions reductions that could be achieved, the technical feasibility

of such actions, the operational impacts on the railyard's throughput velocity and fluidity, safety, the availability of land and access, the costs and cost-effectiveness of such actions, and any railyard-specific factors at the UP Commerce Railyard. Each operational option shall be analyzed, and recommendations, if any, for implementation will be completed as soon as possible for this railyard, but in any case not later than December 31, 2013. UP shall provide the assessment and any recommendations for implementation of operational changes to ARB, and ARB will make them publicly available.

ARB commits to support these efforts with technical assistance and to evaluate the impacts of each potential operational change on the maximum individual cancer risk for the railyard. ARB will make the results of this evaluation publicly available.

**7. Will UP be able to access incentive funding to support these commitments?**

UP, to the extent feasible, will compete for federal, State, local, and private incentive funding to supplement its capital expenditures, and to accelerate further diesel PM and NOx emission reductions at this railyard.

Consistent with State law and Board policies, ARB staff will support efforts by UP to seek a mix of federal, State, and local incentive funding to accelerate UP's ability to meet the diesel PM emission reduction levels for the railyard.

**8. What are the provisions for UP and ARB to meet and confer?**

UP agrees to meet and confer with ARB in 2013 regarding the progress being made by locomotive engine manufacturers to produce Tier 4 interstate line haul locomotives and the potential for interstate testing of prototype locomotives to include California.

UP agrees to meet and confer with ARB by 2018 to evaluate and explore opportunities for further diesel PM emission reductions by 2020 and beyond.

**9. What are the mechanisms for ARB to enforce these commitments? What would trigger ARB to initiate regulatory action?**

**a. Potential ARB Actions to Enforce the Revised 2010 Commitments**

Upon a final determination of the ARB Executive Officer, or if appealed, of the administrative appeals panel that UP has failed to meet its commitments set forth herein at Sections 1, 2, 4, 5, and 6, ARB commits to submit to the Board within four months from the date of the determined failure the following locomotive and railyard rulemakings:

- A regulation of switch and medium horsepower locomotives that are not preempted under federal law (e.g., locomotives that primarily operate in California and that were manufactured prior to 1973 or that exceed 133 percent of their useful life since original manufacture or last remanufacture, whichever is later).
- A designated railyard regulation that requires risk reduction audits and plans to achieve targeted emission reduction levels.

ARB will also consider the following actions:

- Pursue federal legislation to expand ARB authority to adopt regulations for in-use locomotives.
- Petition U.S. EPA to strengthen existing federal locomotive regulations.

ARB is designated as the agency responsible for enforcement of the UP commitments. The enforcement authorities specified herein may only be exercised by ARB. UP may, at any time, initiate informal consultations with ARB to identify and resolve concerns or other issues regarding compliance with its commitments herein.

In determining whether UP has met its commitments, ARB and UP (for purposes of this section, individually referred to as “a party” and collectively referred to as “the parties”) agree to the following exclusive process.

#### **b. ARB Verification of Railyard Diesel PM Emission Reduction Levels**

To determine whether UP has met the UP Commerce Railyard diesel PM emission reduction levels specified in Table D-1, ARB will review the comprehensive emission inventories and interim emission inventories in relation to information collected by ARB staff. ARB will conduct semi-annual railyard inspections, which will also be augmented by ARB photographic tracking and field surveys of railyard switch and medium horsepower locomotives. In addition, ARB staff will use the annual UP locomotive NOx fleet average agreement submittals to verify the number and tier of interstate line haul locomotives operating within the South Coast Air Basin. ARB staff will also randomly conduct inspections of UP interstate line haul locomotives entering and exiting the South Coast Air Basin to help assess compliance with the Table D-1 diesel PM emission reduction levels.

#### **c. Preliminary Determination of Non-Compliance**

##### **i. Failure to Comply with the Railyard Diesel PM Emissions Reduction Levels**

Within 30 working days of receipt of the comprehensive railyard diesel PM emission inventories, ARB shall make a written preliminary determination notifying UP as to whether UP met or failed to meet the diesel PM emission reduction levels specified in

Table D-1 for the previous year. If ARB determines that UP has failed to meet its emission reduction levels, ARB shall within the same 30 working days provide UP with its written preliminary determination, which will set forth the reasons for its findings. ARB will, with the greatest precision possible based on data submitted by UP, calculate the difference between the railyard diesel PM emission reduction level reported by UP and the levels required in Table D-1. ARB and UP shall use their respective best efforts to expedite submission and review of the reports. The time periods provided for ARB to make a preliminary compliance determination may be extended by written agreement between ARB and UP.

Within 15 calendar days of receipt of ARB's preliminary determination that UP has failed to meet the emission reduction levels, UP may request to meet and confer with ARB and/or provide ARB with such information and analysis as UP believes appropriate to demonstrate its compliance with the Table D-1 diesel PM emission reduction levels. If a meet and confer is requested, the parties shall meet within 10 working days of the request. Within 15 calendar days after receipt of UP's response or after meeting and conferring with ARB, ARB shall review and consider the information provided by UP and make a final determination, in writing, as to whether UP has failed to meet the Table D-1 diesel PM emission reduction levels. ARB will make such final written determination publicly available.

For the Table D-1 compliance deadlines in 2011, 2013, 2017, or 2020, if ARB staff determines that UP missed its percentage target for the UP Commerce Railyard by not more than 2 percent (e.g., reaching a 53 percent compliance level where 55 percent was required), UP will be given the opportunity to cure this deficiency by the next calendar year, provided it demonstrates the new compliance level by conducting a full inventory analysis. For the Table D-1 compliance deadline in 2015, if ARB staff determines that UP missed its percentage target for the UP Commerce Railyard by not more than 2 percent (e.g., reaching a 67 percent compliance level where 69 percent was required), UP will be given the opportunity to cure this deficiency by the next compliance deadline in 2017, provided it demonstrates the new compliance level by conducting a full inventory analysis. Failure to conduct the analysis or failure to cure the deficiency by the required year shall constitute a failure to meet the appropriate targets in Table D-1.

## **ii. Failure to Comply with Other Railyard Commitments**

If ARB makes a preliminary determination that UP has failed to meet any other of its commitments set forth herein, ARB shall notify UP, in writing, of its findings. Within 15 calendar days, UP may request to meet and confer with ARB and/or provide ARB with such information and analysis as UP believes appropriate to demonstrate its compliance. If a meet and confer is requested, the parties shall meet within 10 working days of the request.

Within 15 calendar days after receipt of UP's response or after meeting and conferring with ARB, ARB will review and consider the information provided by UP and make a

final determination, in writing, as to whether UP has failed to meet any of its non-emission reduction-related commitments. ARB will make such final written determination publicly available.

**d. Final Determination by ARB of Non-Compliance**

A final determination of non-compliance shall specifically identify the reasons why ARB has found UP not to be in compliance with agreed-upon commitments. A final determination of non-compliance for failure to meet the emission reduction levels set forth in Table D-1 will provide ARB's final calculations of the emission reduction levels of the UP Commerce Railyard. Findings of UP's failure to meet other commitments shall set forth in detail ARB's determination of why the commitments have not been met. ARB will publicly post its final determination notice of non-compliance on its website and make available such notice on a list serve that will be established for notifying the public about compliance with the railyard emission reduction commitments.

**e. Dispute Resolution**

In the event of a dispute concerning an ARB final determination of non-compliance or any dispute arising between ARB and UP concerning their respective commitments, the party asserting the dispute shall provide notice to the other party and set forth the issues underlying the dispute. The parties shall meet and confer regarding the identified issues within 15 working days after receipt of notification, and if they cannot reach agreement within 15 working days after such consultation, shall submit their respective positions to an administrative appeals panel, which shall consider the matter as expeditiously as possible. Except for confidential trade secret information, ARB will publicly post on its website and make available by the aforementioned list serve all documents submitted by the parties to the administrative hearing panel. ARB will also post and make available a notice that interested persons may submit written statements of position and supporting documentation to the administrative appeals panel that will be made part of the record of the hearing.

**i. Composition of Administrative Appeals Panel**

The panel shall be comprised of one member selected by ARB, one member selected by UP, and a third member selected by the initial two members from a list of five or more persons that the parties shall agree to within 120 calendar days of their exchange of commitment letters. The list shall include persons qualified to hear matters that are likely to be heard by the dispute resolution panel. From the list of five or more persons, the parties shall select the person most readily available to hear the matter within 30 calendar days (or as soon thereafter as possible) from the date that the person is contacted by either the ARB or UP panel member. If no person from the previously selected list is available to hear the matter within 45 calendar days of being notified, the ARB and UP panel members shall contact an arbitration referral service, identify the matter(s) at issue and accept from the service a list of five persons who are qualified to hear the matter(s) at issue and are readily available. The two panel members selected

by the parties may mutually agree on one of the five persons to serve on the panel, but if they cannot agree, each panel member will alternatively strike one person from the list until just one person remains. The two panel members selected by the parties will serve as technical advisors to the third panel member, who shall serve as the presiding member of the panel and who shall be solely responsible for making the final decision on behalf of the panel.

**ii. Administrative Appeals Panel Process**

Unless otherwise determined that the matter(s) at issue require oral testimony, the panel shall make its decision based upon the written submissions of ARB and UP and any written statements submitted by interested persons (see below). If a hearing to take testimony is determined to be necessary, the hearing shall be public. The panel shall determine the time and place of the hearing, and will set forth the procedures to be followed at the hearing. The panel will take all precautions necessary to preserve the confidentiality of trade secret or other confidential information, and will consider such evidence in a closed meeting.

**iii. Public Comments to Administrative Appeals Panel**

Interested persons may submit written statements and supporting documentation to the panel regarding the matter(s) at issue before the matter(s) are taken under submission, however, only ARB and UP shall be parties to the dispute resolution process.

**iv. Final Decision by Administrative Appeals Panel**

The panel presiding member shall issue his or her final decision on behalf of the panel within 30 calendar days from the date that the matter is submitted to the panel. While either party receiving an adverse decision from the panel may seek expedited review of the decision in the Superior Court for the County of Sacramento, if the panel's decision upholds the Executive Officer's final determination of non-compliance, ARB may immediately commence the rulemaking process outlined in the opening paragraphs of this section. If judicial review is not sought, then the decision of the panel will be binding on ARB and UP, as well as any interested person or Intended Beneficiary of the Revised 2010 Commitments (see below).

**v. Costs and Fees**

Each party to the proceedings outlined above will bear its own costs and fees, with the exception that the parties agree to split all costs and fees arising from the employment of the third panel member.

**10. What are the rights of residents near railyards to enforce ARB's Revised 2010 Commitments?**

**a. Rights of Persons Other Than ARB and UP**

Residents living within two miles of the UP Commerce Railyard are the intended beneficiaries (Intended Beneficiaries) of these Revised 2010 Commitments and are entitled to bring an action in mandamus in the Superior Court of Sacramento against ARB to ensure that ARB meets its commitments under the Revised 2010 Commitments.

The Intended Beneficiaries will be bound by the outcomes of all dispute resolution processes engaged in by ARB and UP. If UP fails to meet its commitments under the Revised 2010 Commitments, only ARB has the right to exercise the provisions of Section 9, which are the exclusive remedies provided under the Revised 2010 Commitments for non-compliance by UP. Except as provided in Section 10, the Revised 2010 Commitments do not create any new rights, including the right of enforcement, for any person (including Intended Beneficiaries) or entity other than ARB or UP.

**b. Notice and Opportunity to Cure**

To provide ARB with an opportunity to cure or otherwise address an alleged failure by ARB to meet one of its commitments under the Revised 2010 Commitments, Intended Beneficiaries shall provide ARB with at least 45 days written notice of its intent to seek an order of mandamus from the Superior Court of Sacramento. The notice shall identify the alleged failure, the harm caused by the alleged failure, and the factual basis supporting the allegation. If ARB receives such a notice, ARB shall forward a complete copy to BNSF Railway (BNSF) and UP within five working days and shall within a reasonable period of time thereafter notify BNSF, UP, and the Intended Beneficiaries who provided ARB with notice of the pending action as to whether ARB has been able to cure (or is in the process of curing) the alleged failure or whether the alleged failure is incurable in ARB's view.

If ARB fails to cure or to take reasonable steps towards promptly curing the alleged failure within 45 days after receiving notice, the Intended Beneficiaries may proceed to file above-referenced mandamus action in the Superior Court of Sacramento.

**11. How will UP handle the disposition of any pre-Tier 0 locomotive formerly based in the UP Commerce Railyard?**

UP shall not reassign any pre-Tier 0 locomotive formerly based in the UP Commerce Railyard to another railyard in California.

**12. What are the requirements if UP is considering withdrawal from these Revised 2010 Commitments?**

The parties are pledged to successful implementation of the Revised 2010 Commitments. UP will meet and confer with ARB prior to any action to withdraw from these Revised 2010 Commitments. UP and ARB may mutually elect to amend the Revised 2010 Commitments to withdraw or modify specific provisions. If a reasonable resolution cannot be achieved, UP may withdraw from the Revised 2010 Commitments as specifically provided below.

**a. ARB Action Prior to Meeting the Requirements of Section 9**

If ARB proceeds with the rulemakings or other actions identified in Section 9.a. prior to a final determination of UP non-compliance with the Revised 2010 Commitments, UP may withdraw from these Commitments.

**b. Other Reasons**

If either of the following actions occurs, UP may also withdraw from the Revised 2010 Commitments, but UP shall continue to comply with Section 13 to maintain progress through December 31, 2020:

- ARB invokes its remedies under Section 9.a. according to the process prescribed in Section 9.
- An agency of the federal government, the State of California (other than ARB), or a local subdivision of the State of California enacts, mandates, or requires UP to perform an action at the UP Commerce Railyard or affecting this railyard that is identical or substantially similar to actions required to meet these Revised 2010 Commitments. However, actions taken by the City of Los Angeles Harbor Department, the City of Long Beach (acting by and through its Board of Harbor Commissioners), or the Intermodal Container Transfer Facility – Joint Powers Authority related to implementation of the San Pedro Bay Ports Clean Air Action Plan or approval of a new railyard or expansion of an existing railyard do not constitute grounds for UP to withdraw from these Revised 2010 Commitments.



**13. How will UP maintain the progress already made at the UP Commerce Railyard if UP withdraws from these Revised 2010 Commitments?**

UP agrees to do all of the following in the event that UP withdraws from these Revised 2010 Commitments at the UP Commerce Railyard for any reason other than that specified in Section 12.a.:

- Through December 31, 2020, substantially maintain the emission reductions required by Table D-1 that were achieved by implementation of these Revised 2010 Commitments at the UP Commerce Railyard through the last compliance deadline. From the date that Section 13 is triggered, subsequent growth in railroad operations is excluded from this provision.
- Through December 31, 2020, provide a report to ARB for the UP Commerce Railyard that demonstrates maintenance of progress as described above. UP shall provide this report every other year, beginning two years following the date of withdrawal.

**14. What are the general meet and confer provisions?**

In order to assure successful implementation of these Revised 2010 Commitments, UP and ARB may at any time meet and confer to review accomplishments, to assess any implementation issues, or to determine if any changes are necessary to improve the overall effectiveness of the Revised 2010 Commitments.

**15. What are the rights of ARB and UP notwithstanding these Revised 2010 Commitments?**

Nothing in this agreement precludes ARB from developing regulations within its authority as required to achieve the goals of the State Implementation Plan and Climate Change Scoping Plan.

UP is implementing its commitments notwithstanding the preemptive effect of the federal Interstate Commerce Commission Termination Act ("ICCTA"), the Clean Air Act, the Commerce Clause and other federal law. UP and ARB recognize that railroads are to a significant degree regulated by federal law, and that aspects of State and local authority to regulate railroads, rail operations, and locomotives are preempted. By executing and performing the Revised 2010 Commitments, UP and ARB agree that there is no waiver or modification of any aspect of federal preemption or setting of any precedent as to preemption, reservation of rights or voluntary compliance with other commitments, rules or agreements.

If ARB proceeds with the rulemaking or other actions identified in Section 9.a., UP reserves all legal and procedural rights to contest said rulemakings or actions.

**16. What constitutes the full understanding of the Parties?**

This document constitutes the full understanding and agreement of ARB and UP with respect to the UP Commerce Railyard regarding the subject matter of the Revised 2010 Commitments. ARB and UP have voluntarily entered into the Revised 2010 Commitments, and nothing in the Revised 2010 Commitments affects the scope of ARB's regulatory authority or the scope of preemption under federal law. ARB and UP agree that no amendment to the Revised 2010 Commitments shall be binding unless in writing and signed by authorized representatives of ARB and UP.

These Revised 2010 Commitments do not revoke, reduce, amend, or modify the undertakings of UP in any previous agreements which remain in effect on the date of this document.

**17. What are the effective dates of these Revised 2010 Commitments?**

These Revised 2010 Commitments shall take effect upon execution by both parties and remain in effect until December 31, 2020 unless amended by ARB and UP.

*IN WITNESS WHEREOF, the parties have executed  
these Revised 2010 Commitments.*

CALIFORNIA AIR RESOURCES BOARD,  
an agency of the State of California

THE UNION PACIFIC RAILROAD  
COMPANY, a Delaware corporation

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James N. Goldstene  
Executive Officer

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Lance M. Fritz  
Executive Vice President of Operations

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Date

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Date

Address for notice:  
1001 "I" Street  
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## **APPENDIX E**

### **REVISED 2010 COMMITMENTS FOR THE UP ICTF/DOLORES RAILYARDS**

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## **Revised Commitments for the UP ICTF/Dolores Railyards**

The Air Resources Board (ARB) requests additional commitments from Union Pacific Railroad (UP) to further reduce diesel particulate matter (PM) emissions at the UP Intermodal Container Transfer Facility (ICTF) and UP Dolores Railyards between 2010 and 2020 (hereinafter referred to as the Revised 2010 Commitments).

The UP ICTF Railyard is an intermodal railyard which was originally built in 1987. The adjacent UP Dolores Railyard is a classification and locomotive maintenance facility built in 1943. For purposes of this document, the UP ICTF/Dolores Railyards are treated as one combined railyard facility (the “railyard”).

If UP fails to 1) achieve the Table E-1 diesel PM emission reduction levels in 2011, 2013, 2015, 2017, or 2020; or 2) provide comprehensive or interim diesel PM emission inventories, air dispersion modeling, or emission reduction plans in compliance with the schedule in Table E-2; ARB will initiate rulemakings as specified in Section 9. The commitments, and ARB oversight, will ensure that the UP ICTF/Dolores Railyards diesel PM emission reduction levels are achieved, verifiable, and enforceable.

### **Summary of Commitments for the UP ICTF/Dolores Railyards**

UP commits to do the following at this railyard:

- Reduce 2005 diesel PM emissions from railyard operations by at least 60 percent by 2011, increasing the reductions to at least 85 percent by 2020, with intermediate commitments for emission reductions in calendar years 2013, 2015, and 2017 to ensure steady progress. UP is implementing existing U.S. Environmental Protection Agency (U.S. EPA) and ARB regulations and agreements and commits to initiate any additional actions needed to meet the diesel PM emission reduction levels on the stated schedule. This commitment shall be met irrespective of any increase in activity or growth at the UP ICTF/Dolores Railyards through 2020, including any increase in capacity resulting from the proposed UP ICTF Modernization Plan, consistent with the provisions of Section 13.
- Ensure that any additional switch or medium horsepower locomotives that operate within the railyard (more than 25 percent of annual hours or 25 percent of annual miles traveled or 25 percent of annual diesel fuel consumption) meet emission levels of 3.0 g/bhp-hr oxides of nitrogen (NO<sub>x</sub>) or less and emissions of 0.1 g/bhp-hr PM or less (over the U.S. EPA line-haul duty cycle). UP has already upgraded existing locomotives that operate within the railyard (more than 25 percent of annual hours or 25 percent of annual miles traveled or 25 percent of annual diesel fuel consumption) to meet these emission levels.

- By December 31, 2012 and December 31, 2013, evaluate and provide recommendations, if any, for implementation of those changes in railyard operations that UP believes may significantly reduce railyard diesel PM emissions, or changes in the location of the railyard emission sources that ARB believes may reduce health risk, and that meet all other specified criteria articulated in Section 6.
- Beginning one month after UP's acceptance of these commitments, identify any non-preempted switch or medium horsepower locomotive that operates more than five consecutive calendar days within the railyard and subsequently report this information to ARB with UP's annual reports pursuant to the 1998 Locomotive NOx Fleet Average Agreement.
- Prepare and submit railyard diesel PM emission inventories, air dispersion modeling analyses, and emission reduction plans in each year specified in Table E-2.
- Work collaboratively with ARB to provide ongoing communication of railyard diesel PM emission reduction progress to the public through local community meetings and fact sheets.

As part of a broader initiative, UP commits to:

- Between 2011 and December 31, 2015, work collaboratively with ARB to develop and implement a formal demonstration program for advanced locomotive engines or aftertreatment devices, or other mutually agreed upon technologies to reduce emissions within the railyard. The objective of the locomotive demonstration program will be to support separate, but potentially parallel, efforts to achieve ARB verification of one or more advanced locomotive engines or aftertreatment devices for ultra-low emitting switch and medium horsepower locomotives to achieve emission levels that are equal to or less than U.S. EPA Tier 4 NOx and/or PM emission standards.
- Make available two existing gen-set switch, medium horsepower, or other locomotives annually through 2015 and provide any necessary technical assistance as UP's in-kind contribution to support the demonstration program. If the demonstration program is completed prior to 2015, UP's obligation to make these locomotives available would be satisfied as of the completion date.

ARB commits to:

- Prepare periodic health risk assessments (HRAs) as indicated in Table E-3 for the railyard using the comprehensive railyard diesel PM emission inventories and air dispersion modeling analyses submitted by UP. Also to prepare periodic estimates of future health risks, through 2020, following UP's submittal of draft and final emission reduction plans.



- Review the emission inventories, air dispersion modeling, and emission reduction plans submitted by UP to determine the sufficiency of the information provided and notify UP of any deficiencies.
- Determine compliance with the diesel PM emission reduction levels for each of the years specified in Table E-1, based on the comprehensive inventories submitted by UP and independent ARB verification through inspections, field surveys, and other mechanisms.
- Monitor UP's compliance with the commitments in this document, determine if UP has met its obligations, and if UP has failed to meet the commitments in specified sections, submit rulemakings for locomotives and railyards to the Board within four months from the date of any final determination of non-compliance, as specified in Section 9.
- Support UP's efforts to evaluate options for operational changes with technical assistance to evaluate the potential impacts of such changes on health risk for the railyard.

#### **1. What are the commitments to reduce diesel PM emissions?**

UP shall meet the diesel PM emission reduction levels at the UP ICTF/Dolores Railyards by the specified compliance deadlines set forth in Table E-1 irrespective of receipt of public incentive funds. UP may, however, use incentive funds, if available, to achieve the emission reduction levels. This includes funds under Proposition 1B to replace, repower, or retrofit locomotives. To meet the 85 percent reduction level, ARB staff estimates that the railyard diesel PM emissions of 20.3 tons per year in 2005 will need to be reduced to about 3.0 tons per year by 2020.

Typical emission sources within the railyard affected by the diesel PM emission reduction levels in Table E-1 include interstate line haul locomotives, switch and medium horsepower locomotives, drayage trucks, cargo handling equipment such as cranes and yard hostlers, transport refrigeration units operated with drayage trucks or railcars, and stationary engines and maintenance equipment. Passenger locomotive emissions are excluded from the calculation of railyard diesel PM emissions and reductions used to determine compliance with Table E-1.

**Table E-1. UP ICTF/Dolores Railyards  
Diesel PM Emission Reduction Levels and Schedule**

<b>Compliance Deadline</b>	<b>Percent Diesel PM Reductions from 2005 Baseline*</b>	<b>Tons per Year Diesel PM Reductions from 2005 Baseline**</b>
December 31, 2011	60 percent	12.2
December 31, 2013	65 percent	13.2
December 31, 2015	74 percent	15.0
December 31, 2017	75 percent	15.2
December 31, 2020	85 percent	17.3

\* If, after the effective date of this program, ARB reduces the stringency or extends the effective date of ARB regulations affecting non-locomotive diesel PM emission sources at railyards, or U.S. EPA reduces the stringency or extends the effective date of its locomotive PM emission standards, the diesel PM emission reduction levels will be adjusted by ARB accordingly.

\*\* Tons subject to revision if ARB updates the 2005 Baseline number.

ARB staff will use the emissions inventory reported in the 2005 Health Risk Assessment as the 2005 baseline, together with the comprehensive emission inventory submittals for subsequent years, to determine compliance with the Table E-1 emission reduction levels. If ARB revises the *ARB Railyard Emission Inventory Methodology* (2006), ARB staff will recalculate the 2005 Baseline and apply the percent diesel PM reduction listed in Table E-1 to update the associated tons per year of diesel PM reductions required by each compliance deadline. ARB staff will validate the inventory information through a thorough technical review of the data, ongoing ARB railyard inspections, ARB field surveys, and ARB tracking of locomotive and railyard operations.

## **2. Does growth change the commitments to reduce diesel PM emissions?**

No. UP commits to reducing diesel PM emissions from the UP ICTF/Dolores Railyards by at least 85 percent by 2020 and meeting the intermediate levels in Table E-1, regardless of whether the proposed UP ICTF Modernization Plan is implemented and regardless of the potential increases in railyard activity levels, such as the number of container lifts.

### **3. How can UP reduce railyard diesel PM emissions 85 percent by 2020?**

ARB's supporting analysis for feasible emission reductions at UP ICTF/Dolores Railyards is located in a separate document entitled, *Basis for Proposed Commitments to Reduce Diesel Particulate Matter at the UP ICTF/Dolores Railyards (Basis for Proposed Commitments: June 2010)*. This *Basis for Proposed Commitments* document describes possible options that could be implemented to achieve the Table E-1 diesel PM emission reduction levels.

In 2005, the railyard generated an estimated 20.3 tons per year of diesel PM emissions from freight operations. ARB staff estimates that existing U.S. EPA and ARB regulations and agreements will reduce diesel PM emissions at the railyard down to 4.6 tons per year by 2020 (a 77 percent reduction). ARB staff estimates that UP can further cut the railyard diesel PM emissions by 1.6 tons per year by 2020 (achieving an 85 percent reduction compared to 2005 levels).

The required diesel PM emission reductions from existing U.S. EPA and ARB regulations and agreements at the railyard will occur with or without implementation of the UP ICTF Modernization Plan. If the Modernization Plan is put into place, increases in locomotive emissions due to greater container volume would be largely offset by the near elimination of cargo equipment emissions through conversion of the equipment from diesel fuel to electric power.

### **4. What are the railroad commitments to prepare and submit emission inventories, air dispersion modeling, and emission reduction plans? What are the ARB commitments to publicly release the railroad documents and health risk assessments?**

Table E-2 shows the schedule for UP to submit the railyard diesel PM emission inventories, air dispersion modeling, and draft and final emission reduction plans. Table E-3 identifies the dates by which ARB shall release the railyard diesel PM emission inventories, air dispersion modeling, health risk assessments, and the emission reduction plans for public review.

**Table E-2. UP ICTF/Dolores Railyards  
Schedule for UP Submittal of Documents: Emission Inventories,  
Air Dispersion Modeling, and Emission Reduction Plans**

<b>Calendar Year</b>	<b>Emission Inventory <sup>a</sup></b>	<b>Air Dispersion Modeling</b>	<b>Draft Emission Reduction Plan</b>	<b>Final Emission Reduction Plan</b>
2010	Dec 31, 2011 (I)	-----	-----	-----
<b>2011</b>	Apr 1, 2012 (C)	Jun 1, 2012	Sep 1, 2012	Dec 31, 2012
2012	Apr 1, 2013 (I)	-----	-----	-----
<b>2013</b>	Apr 1, 2014 (C)	Jun 1, 2014	Sep 1, 2014	Dec 31, 2014
2014	Apr 1, 2015 (I)	-----	-----	-----
<b>2015</b>	Apr 1, 2016 (C)	Jun 1, 2016	Sep 1, 2016	Dec 31, 2016
2016	Apr 1, 2017 (I)	-----	-----	-----
<b>2017</b>	Apr 1, 2018 (C)	Jun 1, 2018	Sep 1, 2018	Dec 31, 2018
2018	Apr 1, 2019 (I)	-----	-----	-----
2019	Apr 1, 2020 (I)	-----	-----	-----
<b>2020</b>	Apr 1, 2021 (C)	-----	-----	-----

<sup>a</sup> (C) = Comprehensive Emission Inventory. (I) = Interim Emission Inventory.

**Table E-3. UP ICTF/Dolores Railyards  
Schedule for ARB Release of Documents: Emission Inventories, Air Dispersion  
Modeling, ARB Health Risk Assessments, and Emission Reduction Plans**

<b>Calendar Year</b>	<b>Railroad Emission Inventory <sup>a</sup></b>	<b>Railroad Air Dispersion Modeling</b>	<b>ARB Health Risk Assessment</b>	<b>Railroad Draft Emission Reduction Plan <sup>b</sup></b>	<b>Railroad Final Emission Reduction Plan <sup>b</sup></b>
2010	Jan 15, 2012 (I)	-----	-----	-----	-----
<b>2011</b>	Apr 15, 2012 (C)	Jun 15, 2012	Oct 1, 2012	Oct 1, 2012	Jan 15, 2013
2012	Apr 15, 2013 (I)	-----	-----	-----	-----
<b>2013</b>	Apr 15, 2014 (C)	Jun 15, 2014	Oct 1, 2014	Oct 1, 2014	Jan 15, 2015
2014	Apr 15, 2015 (I)	-----	-----	-----	-----
<b>2015</b>	Apr 15, 2016 (C)	Jun 15, 2016	Oct 1, 2016	Oct 1, 2016	Jan 15, 2017
2016	Apr 15, 2017 (I)	-----	-----	-----	-----
<b>2017</b>	Apr 15, 2018 (C)	Jun 15, 2018	Oct 1, 2018	Oct 1, 2018	Jan 15, 2019
2018	Apr 15, 2019 (I)	-----	-----	-----	-----
2019	Apr 15, 2020 (I)	-----	-----	-----	-----
<b>2020</b>	Apr 15, 2021 (C)	-----	-----	-----	-----

<sup>a</sup> (C) = Comprehensive Emission Inventory. (I) = Interim Emission Inventory.

<sup>b</sup> Following submittal of the draft and final emission reduction plan, ARB staff will provide a brief supplemental document that estimates the associated health risk for future compliance years.

**a. Railyard Diesel PM Emission Inventories**

**i. Comprehensive Diesel PM Emission Inventories**

UP commits to prepare the comprehensive diesel PM emission inventories for calendar years 2011, 2013, 2015, 2017, and 2020. UP shall prepare each comprehensive diesel PM emission inventory for the railyard in accordance with *ARB Railyard Emission Inventory Methodology* (2006) or its subsequent revisions, using data for the whole of that calendar year. The comprehensive diesel PM emission inventories will include, to the extent reasonably available, detailed activity information such as locomotive event recorder data, hours of operation for cargo handling equipment and transport refrigeration units, and drayage truck time in operation within the railyard. The comprehensive inventory will also identify activity and growth projections through 2020, and the basis for those projections.

## **ii. Interim Diesel PM Emission Inventories**

UP commits to prepare interim diesel PM emission inventories for the railyard for calendar years 2010, 2012, 2014, 2016, 2018, and 2019, using data for the whole of the calendar year. The interim emission inventories will identify and utilize updates on locomotive usage, other equipment changes, and activity levels (e.g., number of lifts, drayage truck activities, locomotive shop releases, if applicable) to quantify changes to the last comprehensive diesel PM emission inventory. The interim inventory for calendar year 2010 will quantify changes to the comprehensive 2005 diesel PM emission inventory. ARB staff will use the interim emission inventories to consider if there are any potential issues with UP continuing to make sufficient progress in order to meet the railyard diesel PM emission levels specified in Table E-1.

### **b. Air Dispersion Modeling**

UP commits to prepare air dispersion modeling based on the schedule in Table E-2. Air dispersion modeling is to be performed in accordance with *ARB Health Risk Assessment Guidance for Railyard and Intermodal Facilities* (2006) or its subsequent revisions. UP also commits to provide source apportionment data for receptors defined in the air dispersion model and a source contribution analysis. UP also commits to analyze the impacts on the modeled air concentrations from significant updates to the modeling methodology, such as the current version of AERMOD model from U.S. EPA, the availability of updated meteorological data, or any other modeling parameters or inputs which could substantively affect the modeling estimations.

### **c. Health Risk Assessments**

ARB staff commits to prepare health risk assessments using the comprehensive diesel PM emission inventories and air dispersion modeling results. The risk assessments are to be prepared in accordance with *ARB Health Risk Assessment Guidance for Railyard and Intermodal Facilities* (2006) or its subsequent revisions. The updated risk assessments will provide detailed information comparing excess cancer risks and non-cancer health effects with the estimates in the 2005 Health Risk Assessment. ARB staff will compare 2005 railyard emissions and associated health effects with risk assessment results for later years using the same or similar methodology, and also include a separate analysis for any subsequent changes in future year methodologies. ARB staff shall complete the health risk assessment reports for the railyard according to the schedule provided in Table E-3.

Following UP's submittal of the draft and final emission reduction plans, ARB also commits to provide a brief supplemental document to the public that estimates the associated health risk for future compliance years. If ARB's health risk estimates for the draft emission reduction plan do not project that health risk will continue to be reduced, ARB shall include that information in its written comments to UP on UP's draft emission reduction plan.

**d. Emission Reduction Plans**

UP commits to submit draft and final emission reduction plans according to the schedule in Table E-2. The emission reduction plans are to be based on the most recent railyard diesel PM emission inventories. The purpose of the plans is for UP to detail the actions it will take to reduce railyard emissions down to the levels shown in Table E-1 for the next compliance deadline, and the range of potential actions it intends to pursue for subsequent compliance deadlines. The emission reductions plans will document existing and projected railyard diesel PM emissions through 2020 (accounting for growth), describe changes in source category activities, identify existing and future actions to cut emissions and provide specific implementation schedules for these actions.

**e. ARB Review**

**i. Diesel PM Emission Inventories and Air Dispersion Modeling**

Within 20 calendar days of receipt of a railyard comprehensive or interim diesel PM emission inventory, or air dispersion modeling, ARB shall review the submission for completeness and accuracy and will notify UP of its findings. If ARB determines that the submission is not complete and accurate, it will, within the above 20-day time period, notify UP in writing of any deficiency and the reasons therefor, and make such written notification publicly available.

Upon receipt of a notice of deficiency from ARB, UP will within 15 calendar days correct the deficiencies and resubmit the submission to ARB. Within 10 calendar days, ARB will notify UP as to whether the submission is complete and accurate. If not, ARB will make a preliminary determination of non-compliance following the procedures set forth in Section 9.c.ii below.

**ii. Emission Reduction Plans**

Within 30 calendar days of receipt of a draft railyard emission reduction plan, ARB shall review the plan for completeness and accuracy and shall notify UP of its findings. If ARB determines that the draft plan is not complete and accurate, or that the draft plan, in ARB staff's opinion, cannot reasonably achieve the diesel PM reductions required by the next compliance deadline as set forth in Table E-1, ARB shall, within the above 30-day time period, notify UP in writing of any deficiency and the reasons therefor, and make such written notification publicly available.

Within 30 calendar days of receipt of the final plan, ARB shall notify UP as to whether the plan is complete, accurate, and can reasonably achieve the diesel PM emission reductions required by the next compliance deadline as set forth in Table E-1, and make sure such written notification is publicly available. If not, ARB shall make a preliminary determination of non-compliance as set forth in Section 9.c.ii below. Subsequently, if the administrative appeals panel fully or partially affirms the finding of ARB staff, UP will have 30 calendar days to submit to ARB a revised final plan for the next compliance deadline to cure any deficiencies upheld by the panel. If UP fails to submit a revised final plan or if ARB staff determines the revised final plan is still deficient, ARB may immediately commence the rulemaking process outlined in the opening paragraphs of Section 9.

**f. Commitment to Follow Through on Final Emission Reduction Plan**

UP shall take the necessary actions identified in the final emission reduction plan in accordance with the plan's implementation schedules to meet the diesel PM emission reduction levels for the next compliance deadline as set forth in Table E-1. If UP determines that alternative actions not identified in its most recent plan should be implemented to achieve the emission reduction levels for the next compliance deadline, and the alternative actions materially alter the pathway for achieving the emission reductions in the plan, UP will within 15 days of its determination notify ARB of the alternative actions and the reasons for the changes.

**5. What is the commitment for public meetings and outreach?**

UP and ARB commit to hold a public meeting no later than December 15 of 2012, 2014, 2016, and 2018, with members of the surrounding community following the release of the most current ARB health risk assessment and UP draft emission reduction plan as specified in the Table E-3 schedule. At the public meeting, UP and ARB staff will seek public input on the available documents prior to ARB's final determination on the emission reduction plan.

**6. What is the commitment to evaluate options for operational changes?**

UP commits to evaluate and provide recommendations, if any, for the implementation of those changes in railyard operations that UP believes may significantly reduce railyard diesel PM emissions or changes in the location of the railyard emission sources that ARB believes may reduce health risk. UP shall evaluate potential changes at the UP ICTF/Dolores Railyards according to the following schedule, including:

- By December 31, 2012:
  - Installation of a stationary collection system to reduce locomotive maintenance and service related emissions.
  - Relocation of diesel-fueled yard tractors and transport refrigeration units.



- By December 31, 2013:
  - Relocation of the truck gate (part of the UP ICTF Modernization Plan)
  - Relocation of the locomotive maintenance and service facilities.
  - Electric infrastructure to support operation of rail mounted gantry cranes and stationary transport refrigeration units.

UP will conduct this one-time operational review considering, among other things, the potential diesel PM emissions reductions that could be achieved, the technical feasibility of such actions, the operational impacts on the railyard's throughput velocity and fluidity, safety, the availability of land and access, the costs and cost-effectiveness of such actions, and any railyard-specific factors at the UP ICTF/Dolores Railyards. Each operational option shall be analyzed, and recommendations, if any, for implementation will be completed as soon as possible for this railyard, but in any case not later than December 31, 2013. UP shall provide the assessment and any recommendations for implementation of operational changes to ARB, and ARB will make them publicly available.

ARB commits to support these efforts with technical assistance and to evaluate the impacts of each potential operational change on the maximum individual cancer risk for the railyard. ARB will make the results of this evaluation publicly available.

**7. Will UP be able to access incentive funding to support these commitments?**

UP, to the extent feasible, will compete for federal, State, local, and private incentive funding to supplement its capital expenditures, and to accelerate further diesel PM and NOx emission reductions at this railyard.

Consistent with State law and Board policies, ARB staff will support efforts by UP to seek a mix of federal, State, and local incentive funding to accelerate UP's ability to meet the diesel PM emission reduction levels for the railyard.

**8. What are the provisions for UP and ARB to meet and confer?**

UP agrees to meet and confer with ARB in 2013 regarding the progress being made by locomotive engine manufacturers to produce Tier 4 interstate line haul locomotives and the potential for interstate testing of prototype locomotives to include California.

UP agrees to meet and confer with ARB by 2018 to evaluate and explore opportunities for further diesel PM emission reductions by 2020 and beyond.

**9. What are the mechanisms for ARB to enforce these commitments? What would trigger ARB to initiate regulatory action?**

**a. Potential ARB Actions to Enforce the Revised 2010 Commitments**

Upon a final determination of the ARB Executive Officer, or if appealed, of the administrative appeals panel that UP has failed to meet its commitments set forth herein at Sections 1, 2, 4, 5, and 6, ARB commits to submit to the Board within four months from the date of the determined failure the following locomotive and railyard rulemakings:

- A regulation of switch and medium horsepower locomotives that are not preempted under federal law (e.g., locomotives that primarily operate in California and that were manufactured prior to 1973 or that exceed 133 percent of their useful life since original manufacture or last remanufacture, whichever is later).
- A designated railyard regulation that requires risk reduction audits and plans to achieve targeted emission reduction levels.

ARB will also consider the following actions:

- Pursue federal legislation to expand ARB authority to adopt regulations for in-use locomotives.
- Petition U.S. EPA to strengthen existing federal locomotive regulations.

ARB is designated as the agency responsible for enforcement of the UP commitments. The enforcement authorities specified herein may only be exercised by ARB. UP may, at any time, initiate informal consultations with ARB to identify and resolve concerns or other issues regarding compliance with its commitments herein.

In determining whether UP has met its commitments, ARB and UP (for purposes of this section, individually referred to as “a party” and collectively referred to as “the parties”) agree to the following exclusive process.

**b. ARB Verification of Railyard Diesel PM Emission Reduction Levels**

To determine whether UP has met the UP ICTF/Dolores Railyards diesel PM emission reduction levels specified in Table E-1, ARB will review the comprehensive emission inventories and interim emission inventories in relation to information collected by ARB staff. ARB will conduct semi-annual railyard inspections, which will also be augmented by ARB photographic tracking and field surveys of railyard switch and medium horsepower locomotives. In addition, ARB staff will use the annual UP locomotive NOx fleet average agreement submittals to verify the number and tier of interstate line haul locomotives operating within the South Coast Air Basin. ARB staff will also randomly conduct inspections of UP interstate line haul locomotives entering and exiting the

South Coast Air Basin to help assess compliance with the Table E-1 diesel PM emission reduction levels.

**c. Preliminary Determination of Non-Compliance**

**i. Failure to Comply with the Railyard Diesel PM Emission Reduction Levels**

Within 30 working days of receipt of the comprehensive railyard diesel PM emission inventories, ARB shall make a written preliminary determination notifying UP as to whether UP met or failed to meet the diesel PM emission reduction levels specified in Table E-1 for the previous year. If ARB determines that UP has failed to meet its emission reduction levels, ARB shall within the same 30 working days provide UP with its written preliminary determination, which will set forth the reasons for its findings. ARB will, with the greatest precision possible based on data submitted by UP, calculate the difference between the railyard diesel PM emission reduction level reported by UP and the levels required in Table E-1. ARB and UP shall use their respective best efforts to expedite submission and review of the reports. The time periods provided for ARB to make a preliminary compliance determination may be extended by written agreement between ARB and UP.

Within 15 calendar days of receipt of ARB's preliminary determination that UP has failed to meet the emission reduction levels, UP may request to meet and confer with ARB and/or provide ARB with such information and analysis as UP believes appropriate to demonstrate its compliance with the Table E-1 diesel PM emission reduction levels. If a meet and confer is requested, the parties shall meet within 10 working days of the request. Within 15 calendar days after receipt of UP's response or after meeting and conferring with ARB, ARB shall review and consider the information provided by UP and make a final determination, in writing, as to whether UP has failed to meet the Table E-1 diesel PM emission reduction levels. ARB will make such final written determination publicly available.

For the Table E-1 compliance deadlines in 2011, 2013, 2015, 2017, or 2020, if ARB staff determines that UP missed its percentage target for the UP ICTF/Dolores Railyards by not more than 2 percent (e.g., reaching a 73 percent compliance level where 75 percent was required), UP will be given the opportunity to cure this deficiency by the next calendar year, provided it demonstrates the new compliance level by conducting a full inventory analysis. Failure to conduct the analysis or failure to cure the deficiency in the following calendar year shall constitute a failure to meet the appropriate targets in Table E-1.

**ii. Failure to Comply with Other Railyard Commitments**

If ARB makes a preliminary determination that UP has failed to meet any other of its commitments set forth herein, ARB shall notify UP, in writing, of its findings. Within 15 calendar days, UP may request to meet and confer with ARB and/or provide ARB

with such information and analysis as UP believes appropriate to demonstrate its compliance. If a meet and confer is requested, the parties shall meet within 10 working days of the request.

Within 15 calendar days after receipt of UP's response or after meeting and conferring with ARB, ARB will review and consider the information provided by UP and make a final determination, in writing, as to whether UP has failed to meet any of its non-emission reduction-related commitments. ARB will make such final written determination publicly available.

**d. Final Determination by ARB of Non-Compliance**

A final determination of non-compliance shall specifically identify the reasons why ARB has found UP not to be in compliance with agreed-upon commitments. A final determination of non-compliance for failure to meet the emission reduction levels set forth in Table E-1 will provide ARB's final calculations of the emission reduction levels of the UP ICTF/Dolores Railyards. Findings of UP's failure to meet other commitments shall set forth in detail ARB's determination of why the commitments have not been met. ARB will publicly post its final determination notice of non-compliance on its website and make available such notice on a list serve that will be established for notifying the public about compliance with the railyard emission reduction commitments.

**e. Dispute Resolution**

In the event of a dispute concerning an ARB final determination of non-compliance or any dispute arising between ARB and UP concerning their respective commitments, the party asserting the dispute shall provide notice to the other party and set forth the issues underlying the dispute. The parties shall meet and confer regarding the identified issues within 15 working days after receipt of notification, and if they cannot reach agreement within 15 working days after such consultation, shall submit their respective positions to an administrative appeals panel, which shall consider the matter as expeditiously as possible. Except for confidential trade secret information, ARB will publicly post on its website and make available by the aforementioned list serve all documents submitted by the parties to the administrative hearing panel. ARB will also post and make available a notice that interested persons may submit written statements of position and supporting documentation to the administrative appeals panel that will be made part of the record of the hearing.

**i. Composition of Administrative Appeals Panel**

The panel shall be comprised of one member selected by ARB, one member selected by UP, and a third member selected by the initial two members from a list of five or more persons that the parties shall agree to within 120 calendar days of their exchange of commitment letters. The list shall include persons qualified to hear matters that are likely to be heard by the dispute resolution panel. From the list of five or more persons, the parties shall select the person most readily available to hear the matter within

30 calendar days (or as soon thereafter as possible) from the date that the person is contacted by either the ARB or UP panel member. If no person from the previously selected list is available to hear the matter within 45 calendar days of being notified, the ARB and UP panel members shall contact an arbitration referral service, identify the matter(s) at issue and accept from the service a list of five persons who are qualified to hear the matter(s) at issue and are readily available. The two panel members selected by the parties may mutually agree on one of the five persons to serve on the panel, but if they cannot agree, each panel member will alternatively strike one person from the list until just one person remains. The two panel members selected by the parties will serve as technical advisors to the third panel member, who shall serve as the presiding member of the panel and who shall be solely responsible for making the final decision on behalf of the panel.

## **ii. Administrative Appeals Panel Process**

Unless otherwise determined that the matter(s) at issue require oral testimony, the panel shall make its decision based upon the written submissions of ARB and UP and any written statements submitted by interested persons (see below). If a hearing to take testimony is determined to be necessary, the hearing shall be public. The panel shall determine the time and place of the hearing, and will set forth the procedures to be followed at the hearing. The panel will take all precautions necessary to preserve the confidentiality of trade secret or other confidential information, and will consider such evidence in a closed meeting.

## **iii. Public Comments to Administrative Appeals Panel**

Interested persons may submit written statements and supporting documentation to the panel regarding the matter(s) at issue before the matter(s) are taken under submission, however, only ARB and UP shall be parties to the dispute resolution process.

## **iv. Final Decision by Administrative Appeals Panel**

The panel presiding member shall issue his or her final decision on behalf of the panel within 30 calendar days from the date that the matter is submitted to the panel. While either party receiving an adverse decision from the panel may seek expedited review of the decision in the Superior Court for the County of Sacramento, if the panel's decision upholds the Executive Officer's final determination of non-compliance, ARB may immediately commence the rulemaking process outlined in the opening paragraphs of this section. If judicial review is not sought, then the decision of the panel will be binding on ARB and UP, as well as any interested person or Intended Beneficiary of the Revised 2010 Commitments (see below).

**v. Costs and Fees**

Each party to the proceedings outlined above will bear its own costs and fees, with the exception that the parties agree to split all costs and fees arising from the employment of the third panel member.

**10. What are the rights of residents near railyards to enforce ARB's Revised 2010 Commitments?**

**a. Rights of Persons Other Than ARB and UP**

Residents living within two miles of the UP ICTF/Dolores Railyards are the intended beneficiaries (Intended Beneficiaries) of these Revised 2010 Commitments and are entitled to bring an action in mandamus in the Superior Court of Sacramento against ARB to ensure that ARB meets its commitments under the Revised 2010 Commitments.

The Intended Beneficiaries will be bound by the outcomes of all dispute resolution processes engaged in by ARB and UP. If UP fails to meet its commitments under the Revised 2010 Commitments, only ARB has the right to exercise the provisions of Section 9, which are the exclusive remedies provided under the Revised 2010 Commitments for non-compliance by UP. Except as provided in Section 10, the Revised 2010 Commitments do not create any new rights, including the right of enforcement, for any person (including Intended Beneficiaries) or entity other than ARB or UP.

**b. Notice and Opportunity to Cure**

To provide ARB with an opportunity to cure or otherwise address an alleged failure by ARB to meet one of its commitments under the Revised 2010 Commitments, Intended Beneficiaries shall provide ARB with at least 45 days written notice of its intent to seek an order of mandamus from the Superior Court of Sacramento. The notice shall identify the alleged failure, the harm caused by the alleged failure, and the factual basis supporting the allegation. If ARB receives such a notice, ARB shall forward a complete copy to BNSF Railway (BNSF) and UP within five working days and shall within a reasonable period of time thereafter notify BNSF, UP, and the Intended Beneficiaries who provided ARB with notice of the pending action as to whether ARB has been able to cure (or is in the process of curing) the alleged failure or whether the alleged failure is incurable in ARB's view.

If ARB fails to cure or to take reasonable steps towards promptly curing the alleged failure within 45 days after receiving notice, the Intended Beneficiaries may proceed to file above-referenced mandamus action in the Superior Court of Sacramento.

**11. How will UP handle the disposition of any pre-Tier 0 locomotive formerly based in the UP ICTF/Dolores Railyards?**

UP shall not reassign any pre-Tier 0 locomotive formerly based in the UP ICTF/Dolores Railyards to another railyard in California.

**12. What are the requirements if UP is considering withdrawal from these Revised 2010 Commitments?**

The parties are pledged to successful implementation of the Revised 2010 Commitments. UP will meet and confer with ARB prior to any action to withdraw from these Revised 2010 Commitments. UP and ARB may mutually elect to amend the Revised 2010 Commitments to withdraw or modify specific provisions. If a reasonable resolution cannot be achieved, UP may withdraw from the Revised 2010 Commitments as specifically provided below.

**a. ARB Action Prior to Meeting the Requirements of Section 9**

If ARB proceeds with the rulemakings or other actions identified in Section 9.a. prior to a final determination of UP non-compliance with the Revised 2010 Commitments, UP may withdraw from these Commitments.

**b. Other Reasons**

If either of the following actions occurs, UP may also withdraw from the Revised 2010 Commitments, but UP shall continue to comply with Section 13 to maintain progress through December 31, 2020:

- ARB invokes its remedies under Section 9.a. according to the process prescribed in Section 9.
- An agency of the federal government, the State of California (other than ARB), or a local subdivision of the State of California enacts, mandates, or requires UP to perform an action at the UP ICTF/Dolores Railyards or affecting this railyard that is identical or substantially similar to actions required to meet these Revised 2010 Commitments. However, actions taken by the City of Los Angeles Harbor Department, the City of Long Beach (acting by and through its Board of Harbor Commissioners), or the Intermodal Container Transfer Facility – Joint Powers Authority related to implementation of the San Pedro Bay Ports Clean Air Action Plan or approval of a new railyard or expansion of an existing railyard do not constitute grounds for UP to withdraw from these Revised 2010 Commitments.

**13. How will UP maintain the progress already made at the UP ICTF/Dolores Railyards if UP withdraws from these Revised 2010 Commitments?**

UP agrees to do all of the following in the event that UP withdraws from these Revised 2010 Commitments at the UP ICTF/Dolores Railyards for any reason other than that specified in Section 12.a.:

- Through December 31, 2020, substantially maintain the emission reductions required by Table E-1 that were achieved by implementation of these Revised 2010 Commitments at the UP ICTF/Dolores Railyards through the last compliance deadline. From the date that Section 13 is triggered, subsequent growth in railroad operations is excluded from this provision.
- Through December 31, 2020, provide a report to ARB for the UP ICTF/Dolores Railyards that demonstrates maintenance of progress as described above. UP shall provide this report every other year, beginning two years following the date of withdrawal.

**14. What are the general meet and confer provisions?**

In order to assure successful implementation of these Revised 2010 Commitments, UP and ARB may at any time meet and confer to review accomplishments, to assess any implementation issues, or to determine if any changes are necessary to improve the overall effectiveness of the Revised 2010 Commitments.

**15. What are the rights of ARB and UP notwithstanding these Revised 2010 Commitments?**

Nothing in this agreement precludes ARB from developing regulations within its authority as required to achieve the goals of the State Implementation Plan and Climate Change Scoping Plan.

UP is implementing its commitments notwithstanding the preemptive effect of the federal Interstate Commerce Commission Termination Act ("ICCTA"), the Clean Air Act, the Commerce Clause and other federal law. UP and ARB recognize that railroads are to a significant degree regulated by federal law, and that aspects of State and local authority to regulate railroads, rail operations, and locomotives are preempted. By executing and performing the Revised 2010 Commitments, UP and ARB agree that there is no waiver or modification of any aspect of federal preemption or setting of any precedent as to preemption, reservation of rights or voluntary compliance with other commitments, rules or agreements.

If ARB proceeds with the rulemaking or other actions identified in Section 9.a., UP reserves all legal and procedural rights to contest said rulemakings or actions.



**16. What constitutes the full understanding of the Parties?**

This document constitutes the full understanding and agreement of ARB and UP with respect to the UP ICTF/Dolores Railyards regarding the subject matter of the Revised 2010 Commitments. ARB and UP have voluntarily entered into the Revised 2010 Commitments, and nothing in the Revised 2010 Commitments affects the scope of ARB's regulatory authority or the scope of preemption under federal law. ARB and UP agree that no amendment to the Revised 2010 Commitments shall be binding unless in writing and signed by authorized representatives of ARB and UP.

These Revised 2010 Commitments do not revoke, reduce, amend, or modify the undertakings of UP in any previous agreements which remain in effect on the date of this document.

**17. What are the effective dates of these Revised 2010 Commitments?**

These Revised 2010 Commitments shall take effect upon execution by both parties and remain in effect until December 31, 2020 unless amended by ARB and UP.

*IN WITNESS WHEREOF, the parties have executed  
these Revised 2010 Commitments.*

CALIFORNIA AIR RESOURCES BOARD,  
an agency of the State of California

THE UNION PACIFIC RAILROAD  
COMPANY, a Delaware corporation

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James N. Goldstene  
Executive Officer

---

Lance M. Fritz  
Executive Vice President of Operations

---

Date

---

Date

Address for notice:  
1001 "I" Street  
P.O. Box 2815  
Sacramento, CA 95812

Address for notice:  
1400 Douglas Street  
Omaha, NE 68179

**APPENDIX F**

**CALIFORNIA ENVIRONMENTAL QUALITY ACT  
FUNCTIONAL EQUIVALENT DOCUMENT**

Revised 2010 Commitments Between the Air Resources Board and  
Union Pacific Railroad and BNSF Railway  
to Further Reduce Diesel Particulate Emissions at Four High-Priority Railyards

July 5, 2011

California Air Resources Board  
P.O. Box 2815  
1001 "I" Street  
Sacramento, CA 95812

Revised 2010 Commitments for Four High-Priority Railyards  
CEQA Functional Equivalent Document

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## PREFACE

This document constitutes the Functional Equivalent Document (“FED”) for proposed Revised 2010 Commitments Between the Air Resources Board and Union Pacific Railroad and BNSF Railway to Further Reduce Diesel Particulate Emissions at Four High-Priority Railyards (Revised 2010 Commitments).

Interested members of the public may present comments on this Functional Equivalent Document in writing. The public comment period will be for 45 days from July 5, 2011 to August 19, 2011. Comments may be submitted by postal mail or by electronic mail addressed to the following:

Postal mail: Air Resources Board, SSD/Freight Transport Branch – 6<sup>th</sup> Floor,  
Attn: Harold Holmes, 1001 I Street, Sacramento, California 95814

Electronic submittal: on the ARB website for the Revised 2010 Commitments at <http://www.arb.ca.gov/railyard/commitments/commitments.htm>.

Please note that under the California Public Records Act (Government Code §6250 et seq.), your written and oral comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request. Additionally, this information may become available via Google, Yahoo, and any other search engines.

A written response to comments raising significant environmental issues will be prepared and approved by the Executive Officer and posted on the website at <http://www.arb.ca.gov/railyard/commitments/commitments.htm> prior to final action on the Revised 2010 Commitments.

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**Appendix F**  
**California Environmental Quality Act Functional Equivalent Document**

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## EXECUTIVE SUMMARY OF APPENDIX F

Staff of the California Air Resources Board (Board or ARB) is proposing approval of a set of voluntary, but binding, agreements, called the *Revised 2010 Commitments Between the Air Resources Board and Union Pacific Railroad and BNSF Railway to Further Reduce Diesel Particulate Emissions at Four High-Priority Railyards* (“Revised 2010 Commitments” or “Commitments”) to reduce the health risk to communities near these railyards. The four railyards are BNSF San Bernardino and Hobart Railyards, and the UP Commerce and ICTF/Dolores Railyards. The Revised 2010 Commitments were developed in consideration of public testimony and Board direction provided at the September 2009, February 2010, and June 2010 Board meetings, as well as community meetings.

The primary project objective is to reduce air emissions of diesel particulate matter (PM) from operations at the four high-priority railyards, beyond the levels expected under the existing program of adopted regulations and agreements, and specifically to achieve at least an 85 percent reduction in diesel PM emissions at each railyard between 2005 and 2020, regardless of growth in activity or operations. The Revised 2010 Commitments would establish enforceable emission caps and other requirements, tracking mechanisms and deadlines to achieve the diesel PM reductions over the next ten years. In 2020, the benefits attributable to the Revised 2010 Commitments alone are about 12.5 tons per year reduction in diesel PM at the four railyards combined. This translates to about a 30 to 70 percent reduction in the excess cancer risk in 2020 from operations at each railyard.

Staff is proposing these voluntary agreements because they are the most effective and most certain way to achieve substantial new emission reductions from the locomotives that ARB cannot regulate. ARB has already regulated the railyard sources under its direct authority, including drayage trucks, cargo handling equipment, transport refrigeration units, and diesel fuel.

However, ARB lacks authority to regulate the emissions of late-model or remanufactured locomotives that contribute the majority of railyard emissions in future years. Under the federal Clean Air Act, ARB can regulate only the oldest locomotives, which no longer regularly operate in these four high-priority railyards.

## **A. Environmental Review Process**

### **1. California Environmental Quality Act**

The California Environmental Quality Act (CEQA) and ARB regulations require an analysis to identify any potentially significant adverse environmental impacts of ARB's regulations and projects. ARB has determined that execution and implementation of the proposed Revised 2010 Commitments constitutes a "project" as defined by CEQA.<sup>1</sup>

ARB is the lead agency for this project. ARB has prepared this substitute functional equivalent document (FED) in accordance with CEQA and its certified regulatory program. Public Resources Code §21080.5 allows public agencies with regulatory programs to prepare a substitute document in lieu of formal CEQA documents such as initial studies, negative declarations and environmental impact reports once the Secretary of the Resources Agency has certified the regulatory program. The Secretary for the California Natural Resources Agency determined that ARB meets the criteria for a certified State regulatory program.<sup>2</sup>

As required by ARB's certified regulatory program, and the policy and substantive requirements of CEQA, this document presents ARB's assessment of reasonably foreseeable significant long- or short-term adverse and beneficial environmental impacts of the proposed action, and a succinct analysis of those impacts.<sup>3</sup> This document also addresses any feasible mitigation measures and feasible alternatives to the proposed action.

A 45-day public review period is provided for public review and comment on the FED. In accordance with ARB's certified regulatory program, all significant environmental issues raised during this comment period will be responded to in writing and considered prior to final action. A notice of final action and the written responses to comments shall be on ARB's website and filed with the Secretary of the Natural Resources Agency for public inspection.<sup>4</sup>

### **2. Scope of Analysis**

Although the primary focus of conventional CEQA impact assessment is identification and disclosure of adverse environmental impacts, ARB's regulations require the assessment of both beneficial and adverse environmental impacts.<sup>5</sup> The Revised 2010 Commitments establish a performance standard based on the level of emissions for future years that cannot be exceeded regardless of growth in cargo or railyard activity.

---

<sup>1</sup> Public Resources Code, §21000 et seq.; Title 14, California Code of Regulations, (CEQA Guidelines) §15378.

<sup>2</sup> CEQA Guidelines, §15251, subd. (d).

<sup>3</sup> Title 17, California Code of Regulations, §60005.

<sup>4</sup> Title 17, California Code of Regulations, §60007.

<sup>5</sup> Title 17, California Code of Regulations, §60005.

Revised 2010 Commitments for Four High-Priority Railyards  
CEQA Functional Equivalent Document

These levels are based on a specific percent reduction from established 2005 emissions. The railroads will accelerate the use of cleaner technology, possibly in combination with operational improvements, to achieve the required emission reductions at each railyard. These actions will help reduce the health risk in communities near the railyards.

For this project, potential effects on the environment were considered in terms of possible responses by the participating railroads at the four high-priority railyards. ARB staff evaluated possible actions the railroads could take to reduce emissions. The Revised 2010 Commitments are designed to be performance-based rather than prescriptive to gain the support from the railroads that is essential for voluntary agreements. The railroads have repeatedly stated that they will not participate in an agreement that directs or potentially constrains how they may conduct their operations, or an agreement that defines exactly how they must reduce diesel PM emissions.

Because there is inherent flexibility in the Revised 2010 Commitments, in that the commitments do not stipulate specifically how the railroads must comply, particular actions by the railroads cannot be predicted with certainty. However, for purposes of this assessment, staff focused on operational changes that could occur at the four high-priority railyards and any potential adverse environmental impacts associated with such changes. It is important to note that the railroads may choose or not choose to implement any of these responses for any number of reasons.

This analysis of indirect impacts of implementing the Revised 2010 Commitments is necessarily general, programmatic and qualitative in nature. A more detailed analysis is not reasonably feasible at this time because it is unknown what specific future actions will be taken at each railyard to meet the emission reduction targets.

An environmental checklist (Appendix F - Attachment 1) was used to identify the basis for assessing potentially significant adverse impacts associated with potential operational changes at each of the four railyards. Staff's review identified three topics for further review in the FED:

- Aesthetics
- Noise
- Transportation and Traffic

The checklist analysis determined that the remaining environmental topics would not be significantly adversely affected by the proposed project because the project will not involve any changes to the environment that could result in any potentially significant impacts on these resource areas. These include:

- Air Quality
- Agriculture Resources
- Biological Resources

- Cultural Resources
- Geology/Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Population and Housing
- Public Services
- Recreation
- Utilities and Service Systems

These topics are not discussed in detail in the FED. The FED checklist in Attachment 1 provides a brief explanation supporting the determination for each of these resource areas that the project will have no impact. The FED also includes a discussion of beneficial impacts as required by ARB's regulations.<sup>6</sup>

## **B. Summary of Impacts Analysis**

Below is a brief summary of the beneficial impacts and the environmental impacts analysis for each of the topics evaluated in the FED. The beneficial impacts would occur from railroad introduction of cleaner equipment to meet the emission reduction targets in the Revised 2010 Commitments. Virtually all of the potential adverse environmental impacts are directly tied to the possibility of railyard operational changes, which community members urged ARB to include in the agreements. Some of these changes could potentially shift the existing noise, light, or traffic impacts of current railyard activities from one set of nearby residents to another set of residents if operations are relocated within the railyard. It is important to note that the railroads may choose or not choose to implement any of these types of operational changes for any number of reasons.

### 1. Summary of Beneficial Impacts

With existing agreements and regulations described in Chapter III.B., ARB staff estimates that, after accounting for growth, UP and BNSF will reduce diesel PM emissions at the four high-priority railyards by about 50 to 80 percent from 2005 levels by 2020. The Revised 2010 Commitments require further reductions in diesel PM emissions at the four high-priority railyards. With the Revised 2010 Commitments, the projected 2020 diesel PM emissions at the four high-priority railyards will be reduced by an additional 30 to 70 percent.

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<sup>6</sup> Title 17, California Code of Regulations, §60005.



The emission reductions under the Revised 2010 Commitments will reduce the related cancer and health risk from exposure to those emissions. As the railroads replace older interstate locomotives or upgrade the engines in those locomotives to Tier 4 levels to meet the diesel PM levels required by the Revised 2010 Commitments, staff anticipates that communities across the State that are not near the four high-priority railyards would receive about 15 percent of the benefits from the lower-emission locomotives brought in to meet the emission levels at the high-priority railyards. With Tier 4 locomotives, NOx, and HC will be concomitantly reduced by about 85 to 95 percent compared to Tier 0 levels.

## 2. Summary of Impacts Analysis by Resource Area

It is unknown at this time what specific operational changes, if any, will be taken at each railyard. However, possible operational changes could involve changes in locations of lights, noise, aesthetics, and transportation patterns and possibly lead to significant environmental impacts. Staff believes that there is a small probability of significant impacts that could result from changes in railyard operations, and that it is more likely that changes could result in benefits (e.g., quieter locomotives, fewer locomotives that are more powerful to do the same work, etc.).

### *a. Aesthetics*

The Revised 2010 Commitments themselves do not recommend or propose any future changes that would result in changes in lighting or glare. It is unknown at this time what specific operational changes, if any, will be taken at each railyard. However, possible operational changes could involve changes in locations of particular lights at a railyard.

ARB staff does not anticipate that potential changes in operations would lead to changes in light and glare because the railyards are already substantially lighted and any movement of individual lights are not expected to change the existing light and glare from these sights. Although considered unlikely, it is possible that a railroad could shift operations in a way that affects lighting and glare at any of the affected yards. In view of the uncertainty about future actions that could affect light and glare, this analysis takes a conservative approach and considers these impacts to be potentially significant.

*b. Noise*

The Revised 2010 Commitments will not lead to changes in how the railroads comply with existing noise regulations. ARB anticipates that noise will decrease in response to the Revised 2010 Commitments, as railroads will need to deploy new and upgraded lower-emitting locomotives in significant numbers to meet the declining emission levels. These lower-emitting locomotives are quieter than the current models. Staff also anticipates the possibility that some of the existing diesel cargo handling equipment at railyards (such as cranes and yard trucks) may be replaced with fully electric models that are noticeably quieter.

The Revised 2010 Commitments would not increase the total noise at a railyard, but may change the location of some existing noise sources within the railyard. As a result of operational changes, noise from a maintenance facility or cargo handling equipment operation could be moved to a different location within a railyard.

It is unknown at this time what specific operational changes, if any, will be taken at each railyard. Therefore, ARB cannot predict at this time what potential noise impacts could arise from operational changes, including movement of a maintenance facility. In view of the uncertainty of possible noise impacts arising from such an operational change, this analysis takes a conservative approach and considers this to be a potentially significant impact.

*c. Transportation and Traffic*

The Revised 2010 Commitments would not increase the total transportation activities at a railyard, but may change the location of some existing transportation patterns for trucks and other mobile sources to enter and exit the railyard. As a result of operational changes, transportation corridors like truck gate entrances and exits onto nearby arterial roads could be moved to a different location within a railyard.

It is unknown at this time what specific operational changes, if any, will be taken at each railyard. Therefore, ARB cannot predict at this time what potential transportation impacts could arise from operational changes, including movement of a truck gate entrance or exit. In view of the uncertainty of possible transportation impacts arising from such an operational change, this analysis takes a conservative approach and considers this to be a potentially significant impact.

3. Summary of Cumulative Impacts

Based on ARB's review of the related projects and projected development in the area of the four high-priority railyards, staff does not anticipate the incremental effect or impact of the identified potential aesthetics, noise, and transportation and traffic impacts, when added or combined with adopted projections within the area and other recent and future closely related projects, to be cumulatively considerable. However, because it is

unknown what future changes may be undertaken and what development may occur in the area of the railyards that could combine with the railyards' potential impacts, and because the potential aesthetics, noise, and transportation and traffic impacts from the railyards may not be mitigated to a less-than-significant level, this analysis takes a conservative approach and considers the cumulative impacts to be potentially significant. ARB cannot identify feasible mitigation for potential aesthetics, noise, and transportation impacts, so these potential cumulative impacts remain significant and unavoidable.

### **C. Summary of Project Alternatives Evaluated**

#### **1. Alternative A: No Project**

A "No Project" alternative, in this case, would be for ARB and UP and BNSF to not sign and implement the 2010 Railyard Commitments. The No Project alternative would mean the continued implementation of existing U.S. EPA and ARB regulations and agreements from 2005 to 2020. As shown in Tables F-3 through F-6 in Chapter IV, ARB staff estimates that UP and BNSF will reduce diesel PM emissions at the four priority railyards under the existing program by 50 to 80 percent by 2020, compared to 2005 levels. The level of emission reductions under the existing program could be less if growth in cargo activity is high. In contrast, the Revised 2010 Commitments would require UP and BNSF to reduce diesel PM emissions at the four high-priority railyards 85 percent by 2020, compared to 2005 levels, regardless of the growth in cargo activity. The No Project alternative does not even partially satisfy the project objective to achieve reductions beyond the existing program. Although the No Project alternative would not result in the potential adverse impacts associated with operational changes, it would prolong higher diesel PM emissions and associated health risks for residents living near the four high-priority railyards.

#### **2. Alternative B: ARB Regulation for Non-Preempted Freight Locomotives**

Under this alternative, ARB would adopt a statewide regulation requiring at least the major Class I railroads (BNSF and UP) to replace, retrofit, or upgrade any non-preempted locomotives operating in California to achieve more stringent California emission standards. For the regulation to take effect, ARB would need to obtain authorization from U.S. EPA to enforce the regulation under CAA §209(e)(2). Those locomotives and locomotive engines that are not preempted include those that were manufactured prior to 1973 and have not been upgraded (remanufactured) after 2000, and all locomotives that have exceeded 133 percent of their useful life since original manufacture or remanufacture, whichever is later.

Railroads could remove locomotives from the scope of the regulation by (1) converting an arguably non-preempted locomotive to a preempted locomotive by remanufacturing it to meet the minimum U.S. EPA Tier 0+ emission standard or (2) removing the older locomotive from California service and replacing it with a preempted locomotive

(i.e. Tier 0 or Tier 0+) from another state. As a result, there is a range of potential emission reductions that could result from ARB adoption and implementation of such a regulation. On the low end, the diesel PM benefits could be zero if BNSF and UP choose to replace all of the 80 remaining pre-Tier 0 locomotives in California with federally preempted Tier 0 locomotives from other states, because there is no change in PM emission levels between those standards. If BNSF and UP remanufactured the entire existing California fleet of 80 pre-Tier 0 switch and medium horsepower locomotives to comply with an ARB regulation, the remanufacture would have to meet U.S. EPA Tier 0+ standards under federal law. Thus, the resulting benefits would be approximately 0-16 tons of PM per year statewide. There would be virtually no benefits realized at the four high-priority railyards because there are no non-preempted locomotives in routine operation at these railyards.

Although this alternative would not be expected to generate potential adverse impacts on aesthetics, noise, and transportation and traffic, it would not meet the project objectives. This alternative would provide virtually no diesel PM emission reductions within the four high-priority railyards, because there are no non-preempted locomotives in routine operation in these railyards, and potentially no diesel PM emission reductions within the rest of the South Coast Air Basin and the rest of the State. Under this alternative, the diesel PM reductions that could be potentially realized in the South Coast Air Basin and the rest of the State could be subject to a legal challenge by the railroads. As a result, staff found that an ARB non-preempted locomotive regulation would achieve little, if any, of the diesel PM emission reductions required in the Revised 2010 Commitments.

### 3. Alternative C: ARB Regulation Requiring Zero-Emission Cargo Handling Equipment Operating at Intermodal Railyards

Under this alternative, ARB could consider amending the existing statewide regulation for cargo handling equipment operating at ports and intermodal railyards to require certain equipment at intermodal railyards to meet zero-emission levels on site, essentially through electrification of certain operations.

Under such a proposal, the ARB regulation could be amended to require the replacement of nearly all of the existing diesel cargo equipment that moves containers, including existing diesel rubber tired gantry cranes (RTGs), diesel yard tractors and forklifts/picks with electrified rail mounted gantry (RMG) cranes and the installation of the necessary RMG electric infrastructure at covered railyards. While existing diesel RTGs, yard tractors, and forklifts/picks are capable of operating anywhere in the railyard to move containers, an electric RMG is a very large overhead crane mounted on fixed guides that transfers a container between the railcar and the truck. These RMGs are installed in single, fixed location between the rail tracks and the container storage area.

This alternative would result in a reduction in noise at all four railyards. It may also result in short-term construction-related impacts on noise, air quality, and traffic at all

four yards, but the nature and scope of these impacts are unknown at this time. This alternative may result in a potential ongoing impact on transportation and traffic at the BNSF San Bernardino Railyard if a bridge is moved to accommodate a new electric crane.

If ARB staff proposed and the Board adopted a regulatory amendment to implement this alternative consistent with State and federal law, the maximum possible estimate of diesel PM emission reductions achievable at the four high-priority railyards would be less than 2.6 tons per year at a cost of well over \$1.1 billion. However, some of those emissions would remain but be transferred to the communities where the electric power is generated for use at the railyards. As California transitions to more renewable and zero-emission sources to generate electric power, that impact would be expected to diminish.

This alternative would generate potential adverse impacts similar to those of the proposed project. However, compared to the proposed project, this alternative would be substantially less effective at achieving the project objective at the four high-priority railyards, with a maximum of 2.6 tons per year of diesel PM reductions in 2020 versus 12.5 tons per year of additional diesel PM reductions achievable in 2020 with the Revised 2010 Commitments.

#### 4. Alternative D: ARB Regulation Requiring Railroads to Prepare Risk Reduction Audits, Plans, and Measures

Under this alternative, the Board could consider adopting a regulation to require railyards to perform risk reduction audits and plans, and implement measures to reduce railyard risks, similar to the existing requirements under Health and Safety Code “Hot Spots” program that applies to stationary sources and is overseen and enforced by the local air quality management and air pollution control districts.<sup>7</sup>

This alternative would be less effective in meeting the project objective than the Revised 2010 Commitments because any requirements to reduce the health risk from the high-priority railyards would need to exclude the diesel PM emissions from preempted locomotives, the largest remaining emission source in the four high-priority railyards. The maximum remaining diesel PM emissions in 2020 subject to control under this alternative would be 7.4 tons per year for all of the four railyards combined. If all of these on-site emissions were eliminated through electrification, it would still be substantially less effective than the 12.5 tons per year of diesel PM reductions achievable under the Revised 2010 Commitments.

Similar to Alternative C, Alternative D would be likely to result in reconfiguration at the railyards to enable installation and operation of electric rail mounted gantry cranes. Thus, this alternative would result in a longer-term reduction in noise at all four railyards, as well as potential short-term construction-related impacts and potential traffic impacts.

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<sup>7</sup> Health and Safety Code §44300 et seq.

Therefore, this alternative would incur potential adverse environmental impacts substantially similar to the potential adverse environmental impacts of the Revised 2010 Commitments.

#### **D. Conclusion**

The purpose of the alternatives analysis is to determine whether or not a variation of the proposed project would reduce or eliminate significant project impacts, within the basic framework of the project objectives. Each of the four alternatives analyzed (Alternative A: “No Project,” Alternative B: an ARB regulation for non-preempted locomotives, Alternative C: an ARB regulation for zero-emission cargo handling equipment at intermodal railyards, and Alternative D: an ARB regulation for railroad risk reduction audits, plans, and measures) would result in significantly less diesel PM emission reductions at the four high-priority railyards than the proposed project.

Alternatives A and B would not satisfy the project objective at all. Alternatives C and D would be less effective at meeting the project objective and would involve operational changes that share the same potential environmental impacts with the proposed project without reducing them. There are also serious questions about legal authority, costs, and technical feasibility associated with implementation of these alternatives as compared to the proposed Revised 2010 Railyard Commitments.

## I. DOCUMENTS INCORPORATED BY REFERENCE

This FED analysis relies on substantial work done by ARB staff and the railroads to quantify the emissions of diesel PM at each of the four high-priority railyards and assess the resulting human health risk to residents living near each of the four railyards. Each of the eight inventory and health risk assessment documents has been previously published, and has been discussed at community meetings near the applicable railyard.

This analysis also relies on a comprehensive August 2009 ARB report on the technical options to reduce diesel PM emissions from rail operations, and a companion set of September 2009 staff recommendations to the Board on strategies to pursue. Staff's approach to the Revised 2010 Commitments considers comments from the Board and the public in response to presentations at meetings of the Board in 2009 and 2010.

Finally, this analysis builds on the work done for the *June 2010 Staff Report*, as well as this *Supplement to the June 2010 Staff Report* that responds to Board direction for additional evaluation.

All of these published documents are cited below, posted on ARB's railyard program website at the locations noted, and hereby incorporated by reference into this environmental analysis pursuant to CEQA Guidelines, §15150.

- Air Resources Board, *Supplement to June 2010 Staff Report on Proposed Actions to Further Reduce Diesel Particulate Matter at High-Priority California Railyards*, May 2011 (*Supplement to June 2010 Staff Report*). (<http://www.arb.ca.gov/railyard/commitments/commitments.htm>)
- Air Resources Board, *Board Resolution 10-29*, June 24, 2010. (<http://www.arb.ca.gov/railyard/commitments/commitments.htm>)
- Air Resources Board, *Proposed Actions to Further Reduce Diesel Particulate Matter at High Priority California Railyards*, June 2010 (*June 2010 Staff Report*). (<http://www.arb.ca.gov/railyard/commitments/commitmentsarchive.htm>)
- Air Resources Board, Presentation to Board "Update on Efforts to Reduce Emissions and Risks at High Risk Railyards," February 25, 2010. (<http://www.arb.ca.gov/board/books/2010/022510/10-2-5pres.pdf>)
- Air Resources Board, Presentation to Board "Staff Recommendations to Provide Further Locomotive and Railyard Emission Reductions," September 25, 2009. (<http://www.arb.ca.gov/board/books/2009/092409/09-8-5pres.pdf>)
- Air Resources Board, *Recommendations to Implement Further Locomotive and Railyard Emission Reductions*, September 2009 (*Recommendations Document*). (<http://www.arb.ca.gov/railyard/ted/drftrec090909.pdf>)
- Air Resources Board, *Technical Options to Achieve Additional Emissions and Risk Reductions from California Locomotives and Railyards*, August 2009 (*Technical Options Document*). (<http://www.arb.ca.gov/railyard/ted/083109tedr.pdf>)

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- Air Resources Board, *ARB/Railroad Statewide Agreement, Particulate Emissions Reduction Program at California Rail Yards*, June 2005.  
<http://www.arb.ca.gov/msprog/offroad/loco/loco.htm>)
- Air Resources Board, *Memorandum of Mutual Understandings and Agreements, South Coast Locomotive Fleet Average Emission Program*, July 1998.  
<http://www.arb.ca.gov/msprog/offroad/loco/loco.htm>)

Railyard-specific health risk assessments, air dispersion modeling, and emission inventories are available at <http://www.arb.ca.gov/railyard/hra/hra.htm>.

BNSF San Bernardino:

- Air Resources Board, *Health Risk Assessment for the BNSF Railway San Bernardino Railyard*, June 2008.
- ENVIRON International, *Air Dispersion Modeling Assessment of Air Toxic Emissions from BNSF San Bernardino Railyard*, January 2007.
- ENVIRON International, *San Bernardino TAC Emissions Inventory*, January 2008.

BNSF Hobart:

- Air Resources Board, *Health Risk Assessment for the BNSF Railway Hobart Railyard*, November 2007.
- ENVIRON International, *Air Dispersion Modeling Assessment of Air Toxic Emissions from BNSF Hobart Railyard*, December 2006.
- ENVIRON International, *Los Angeles-Hobart Railyard TAC Emissions Inventory*, December 2006.

UP Commerce:

- Air Resources Board, *Health Risk Assessment for the Union Pacific Railroad Commerce Railyard*, November 2007.
- Sierra Research, *Toxic Air Contaminant Emissions Inventory and Dispersion Modeling Report for the Commerce Railyard, Los Angeles, California*, January 2007.

UP ICTF/Dolores:

- Air Resources Board, *Health Risk Assessment for the UP Intermodal Container Transfer Facility (ICTF) and Dolores Railyards*, April 2008.
- Sierra Research, *Toxic Air Contaminant Emissions Inventory and Dispersion Modeling Report for the Dolores and ICTF Railyards, Long Beach, California*, December 2007.

All documents incorporated by reference are either available at the website addresses noted below with certain documents, or at the California Air Resources Board, Stationary Source Division, 1001 "I" Street, Sacramento, CA.

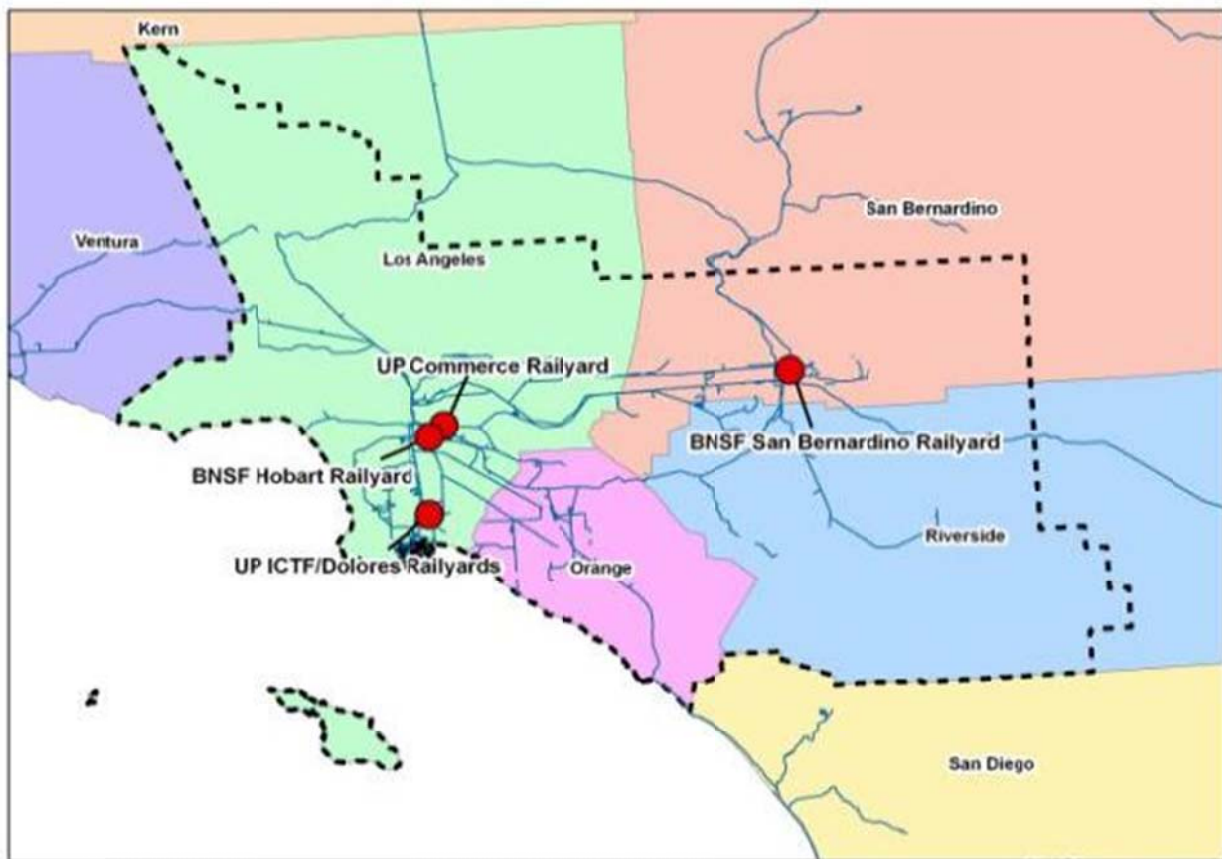


## II. PROJECT DESCRIPTION

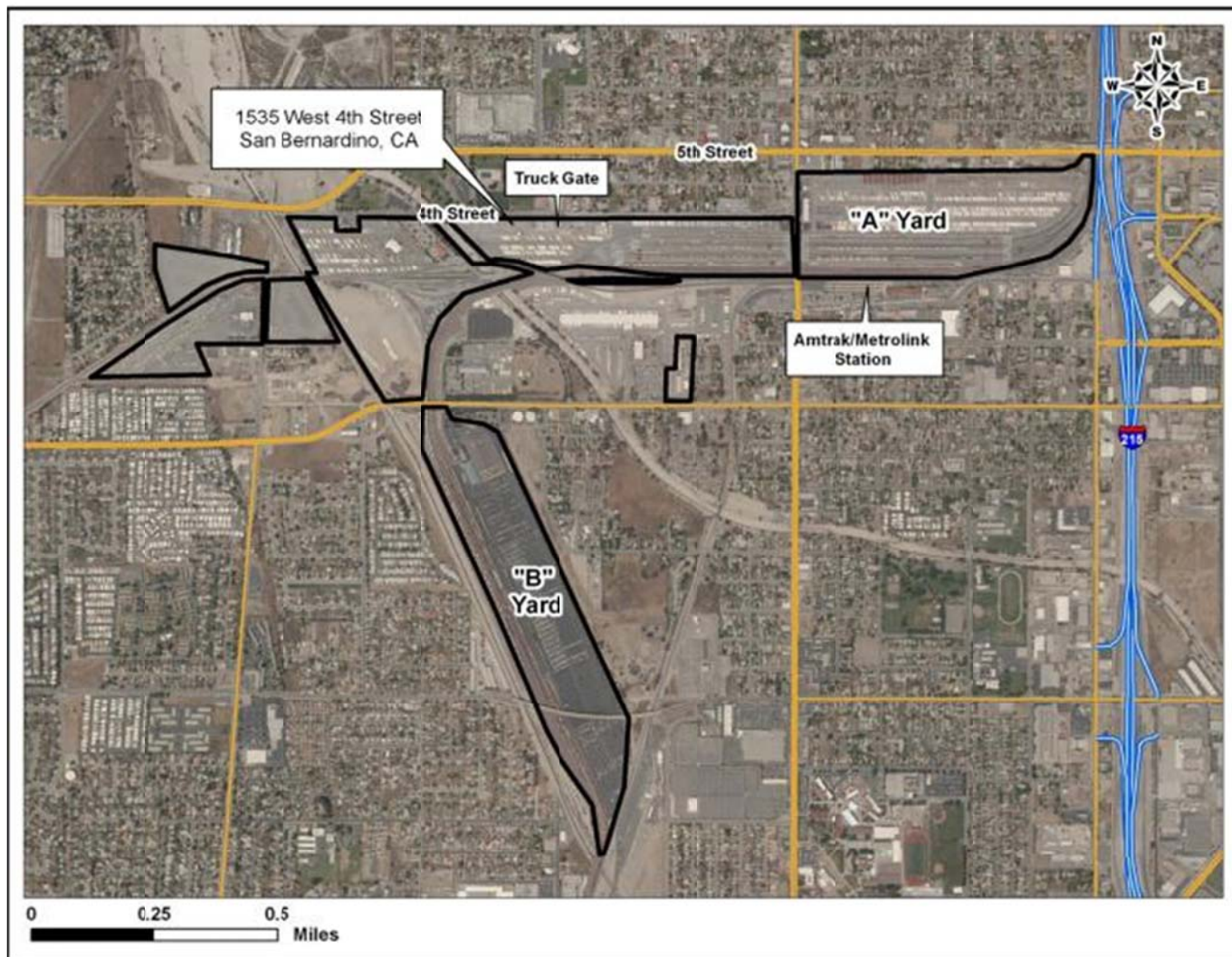
### A. Project Locations

The project covers four locations. A map of the region with the covered railyards and individual maps of each covered railyard are provided below.

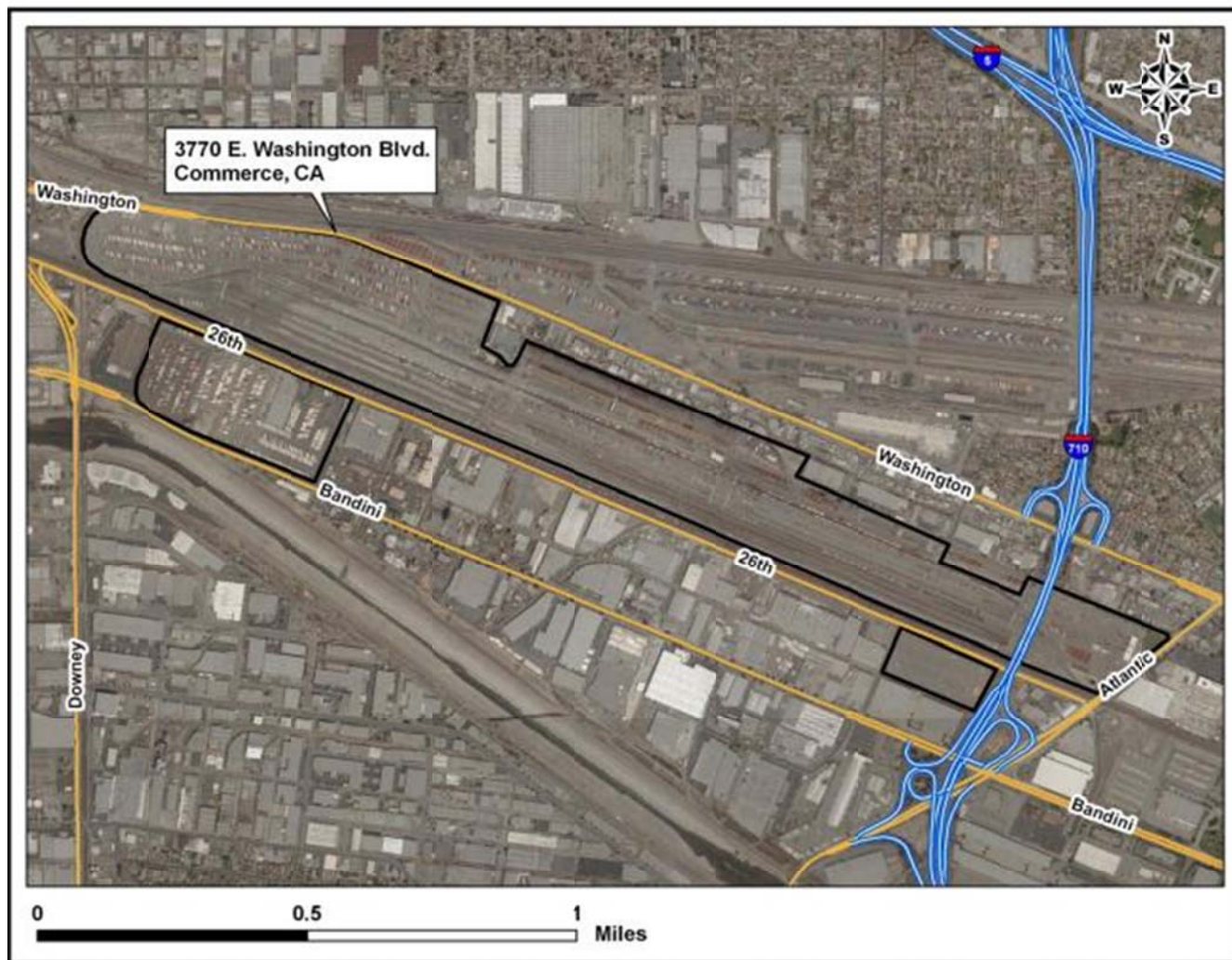
**Figure F-1  
Four High-Priority Railyards Regional Map**



**Figure F-2**  
**BNSF San Bernardino Railyard**  
1535 West Fourth Street  
San Bernardino, CA 94211

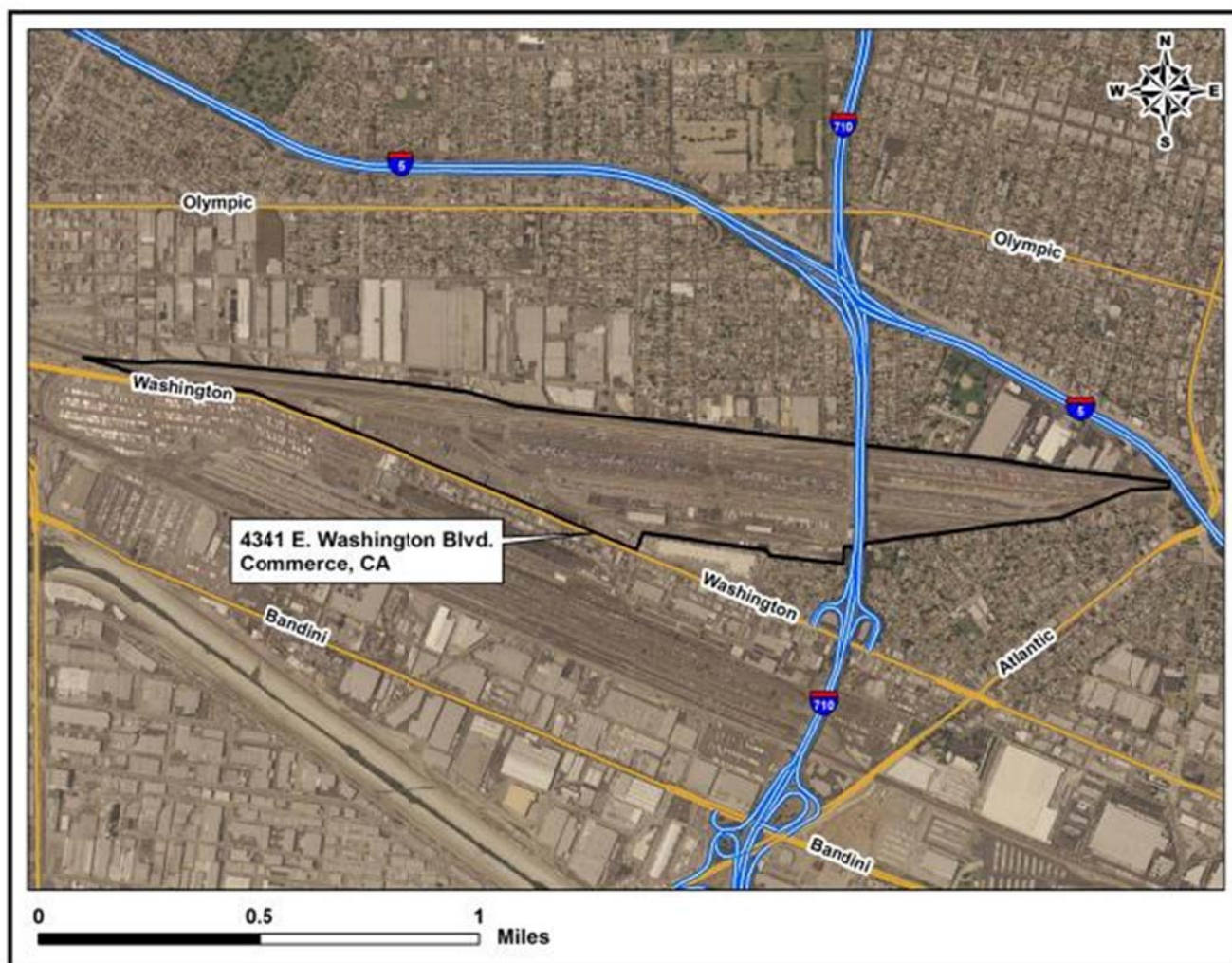


**Figure F-3**  
**BNSF Hobart Railyard**  
3770 East Washington Boulevard  
Commerce, CA 90023





**Figure F-4**  
**UP Commerce Railyard**  
4341 East Washington Boulevard  
Commerce, CA 90023



**Figure F-5**  
**UP ICTF/Dolores Railyards**

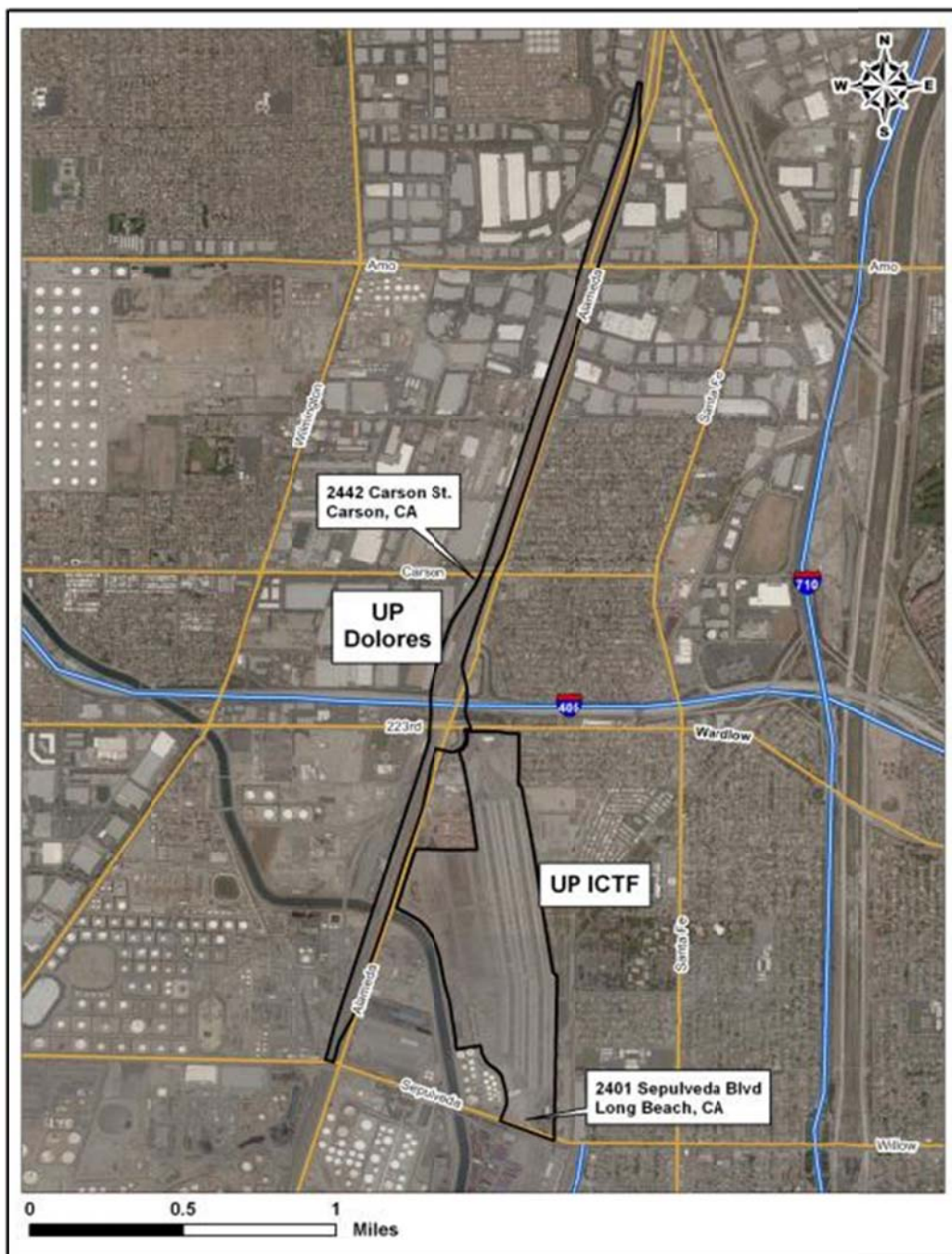
**Intermodal Container Transfer Facility:**

2401 East Sepulveda Boulevard  
Long Beach, CA 90810

**Dolores Railyard**

2442 East Carson Street  
Carson, CA 90810

These facilities are treated as one combined railyard.



## **B. Project Objectives**

The primary project objective is to reduce air emissions of diesel particulate matter (PM) from operations at the four identified high-priority railyards, beyond the levels expected under the existing program of adopted regulations and agreements (described below), and specifically to achieve at least an 85 percent reduction in diesel PM emissions at each railyard between 2005 and 2020, regardless of growth in activity or operations. Of the 18 major railyards in California analyzed by ARB staff, these four railyards posed the greatest estimated excess cancer risk to residents of surrounding communities in 2005. The driver for this cancer risk is exposure to diesel PM emissions, which ARB has identified as a toxic air contaminant (TAC).<sup>8</sup>

Supporting objectives include the ability to monitor compliance, ensure that railroads do not reassign the oldest locomotives from these four railyards to other California railyards, and define ARB actions if the railroads fail to comply.

## **C. Project Description**

### 1. Overview

The proposed project is ARB approval and implementation of a set of voluntary, but binding agreements (called the Revised 2010 Commitments) between ARB and BNSF and UP railroad companies that would require the railroads to achieve substantial defined reductions in diesel PM emissions at four high-priority railyards over a ten-year period, and to do other specified actions. The four railyards are BNSF San Bernardino and Hobart Railyards, and the UP Commerce and ICTF/Dolores Railyards.

The Revised 2010 Commitments are the result of a stated desire by both ARB and the railroad companies to achieve diesel PM reductions at the railyards in a measurable, reliable, and cost-effective manner. The reductions go well beyond levels that are possible under ARB's regulatory framework alone.

Under the Revised 2010 Commitments, the railroads would target their financial resources to making the greatest air quality improvements at the railyards that posed the greatest public health risk to their neighbors according to ARB's assessment of 2005 operations. Implementation would provide additional benefits throughout the South Coast Air Basin and statewide as cleaner locomotives travel beyond the four high-priority railyards.

Staff is proposing these voluntary agreements because they are the most effective and most certain way to achieve substantial new emission reductions from the locomotives that ARB cannot regulate. ARB has already regulated the railyard sources under its

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<sup>8</sup> Title 17, California Code of Regulations, §93000.



direct authority, including drayage trucks,<sup>9</sup> cargo handling equipment,<sup>10</sup> transport refrigeration units,<sup>11</sup> and diesel fuel.<sup>12</sup> However, ARB lacks authority to regulate the emissions of late-model or remanufactured locomotives that contribute the majority of railyard emissions in future years. Under the federal Clean Air Act, ARB can regulate only the oldest locomotives, which no longer regularly operate in these four high-priority railyards.<sup>13</sup>

Although participation by the railroads in the Revised 2010 Commitments is voluntary, once executed, the Revised 2010 Commitments become binding on all parties. The emission reductions must be achieved within specific timeframes. There are recordkeeping, reporting, and compliance monitoring provisions associated with the project. These include ongoing technical reviews of emissions data, staff surveys of locomotive activity, railyard inspections, field surveys, and specified ARB actions if the Revised 2010 Commitments are not met. If approved, the Revised 2010 Commitments represent the region's best opportunity to significantly reduce railyard emissions and health risk at a rate above and beyond what would otherwise occur over the next ten years.

The June 15, 2010 report entitled *Proposed Actions to Further Reduce Diesel Particulate Matter at High Priority California Railyards (June 2010 Staff Report)* provides extensive information on the basis, origin and development of the Revised 2010 Commitments. (See *Documents Incorporated by Reference* in Chapter I.)

## 2. Key Provisions

The provisions of the Revised 2010 Commitments for each high-priority railyard include:

- A performance standard that sets a declining cap on the diesel PM emissions at each railyard from 2011-2020 that will cut diesel PM by at least 85 percent between 2005 and 2020, regardless of growth in cargo activity or operations.
- Independent ARB verification of railroad compliance with the required emission reduction levels.

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<sup>9</sup> Title 13, California Code of Regulations, §2027. New section filed November 24, 2008, operative December 24, 2008.

<sup>10</sup> Title 13, California Code of Regulations, §2479. New section filed and operative December 1, 2006.

<sup>11</sup> Title 13, California Code of Regulations, §2477. New article and section filed November 10, 2004, operative December 10, 2004.

<sup>12</sup> Title 13, California Code of Regulations, §2282-2285. Amendment filed July 15, 2004, operative August 14, 2004.

<sup>13</sup> U.S. EPA establishes emission standards for locomotives. The Board would have the authority to establish regulations for locomotives that primarily operate in California and that were manufactured prior to 1973 or that exceed 133 percent of their useful life since original manufacture or last remanufacture, whichever is later. (A detailed discussion of ARB's regulatory authority is in Appendix A of the *Recommendations to Implement Further Locomotive and Railyard Emission Reductions*, September 2009. <http://www.arb.ca.gov/railyard/ted/drftrec090909.pdf>)

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- A process for review of any final determination by ARB that a railroad has failed to comply, as well as a clear trigger for ARB regulatory action if an administrative appeals panel upholds this determination.
- Periodic emission inventories, health risk assessments, and emission reduction plans for each railyard.
- Railroad evaluation of specific potential operational changes to reduce emissions and/or health risk.
- A prohibition on the railroads on re-assigning any of the very oldest locomotives that might operate at the four high-priority railyards to other railyards in California.
- A joint ARB/railroad demonstration program for advanced locomotive engines or add-on pollution control (aftertreatment) devices to reduce emissions within a railyard.
- Requirements for ARB to make publicly available documents related to implementation and a process for ongoing public participation for the duration of the project.
- A legal mechanism for residents of neighborhoods near the four railyards to ensure ARB meets its obligations by bringing action against ARB in State court following a defined process.
- Defined conditions under which railroads could withdraw from the Revised 2010 Commitments.
- A backstop requirement to ensure that if the railroads should elect to withdraw, the railroads must maintain the emission reduction progress achieved as of the last compliance milestone through 2020.

### 3. Emission Reduction Obligations

Table F-1 summarizes the diesel PM emission reduction levels for each railyard, which indicate the percent reduction from baseline emissions in 2005 that must be achieved by the calendar year indicated. These emission reduction levels reflect the benefits of both the existing program (adopted regulations and agreements) and the new actions railroads would take under the Revised 2010 Commitments. The Revised 2010 Commitments set a hard cap on railyard emissions in each milestone year, independent of the growth in container traffic or railyard activity.



**Table F-1**  
**Proposed Diesel PM Emission Reduction Levels and Schedules**

Railyard	Percent Emission Reductions from 2005 Baseline by December 31 <sup>st</sup> Compliance Date				
	2011	2013	2015	2017	2020
BNSF San Bernardino	45	50	68	73	85
BNSF Hobart	55	65	76	78	85
UP Commerce	50	55	69	70	85
UP ICTF/Dolores	60	65	74	75	85

#### 4. Preparation and Submittal of Documents

The Revised 2010 Commitments require the railroads to prepare and submit multiple diesel PM emission inventories, air dispersion modeling, and emission reduction plans specific to each railyard. They also require ARB to use the inventories and dispersion modeling to provide updated estimates of the health risk associated with diesel PM from railyard operations. ARB will make all of these documents available to the public via its website. The Revised 2010 Commitments include a detailed annual schedule for submittal and posting of each document required in that calendar year.

#### 5. Evaluation of Operational Changes

During the public process, community members expressed interest in ensuring that the railroads consider operational changes that could reduce emissions and/or health impacts from rail operations on nearby residents. These changes may reduce risk through direct emission reductions from specific sources, increasing the distance between the emission sources and nearby residents, or both.

As a result, the Revised 2010 Commitments include requirements that the railroads evaluate various railyard-specific operational changes, and make recommendations as to the appropriateness of implementing those changes. As part of the operational review, the railroads will consider potential diesel PM emission reductions, technical feasibility, operational and safety impacts on the railyards, availability of land access, costs and cost-effectiveness of such actions, and any other railyard-specific factors.

Examples of operational changes include the relocation of truck gates, installation and operation of electric infrastructure to support rail-mounted gantry cranes and stationary transport refrigeration units, relocation of yard tractor and transport refrigeration unit operation, relocation of locomotive maintenance and service facilities, and installation of stationary collection systems to reduce locomotive maintenance and service-related

emissions. The Revised 2010 Commitments include deadlines for the railroads to complete their evaluations of specific operational changes at each railyard and a requirement for ARB to post those evaluations on the website.

The Revised 2010 Commitments would not increase the level of cargo activity or operations at the railyards – the level of activity is governed by economic conditions and the amount of cargo that the railroads' customers chose to move via their lines. However, some of the potential operational changes triggered by the Revised 2010 Commitments could shift the existing noise, light, or transportation or traffic impacts of current railyard activities from one set of nearby residents to another set of residents if operations are relocated within the railyard. These potential changes are evaluated in the Impact Analysis chapter.

#### 6. ARB Action if Railroads Fail to Comply

The Revised 2010 Commitments define a process that ARB will use to assess the railroads' compliance with the emissions performance targets and other railroad responsibilities. There are also dispute resolution procedures that include an administrative appeals panel. The panel for a dispute specific to a railyard includes a representative from the railroad operating that railyard, a representative from ARB, and a presiding third member from a list jointly developed by the railroad and ARB. The railroad and ARB representatives have an advisory role; the presiding third panel member is the sole decision maker to resolve disputes. Meetings of the panel and any evidence submitted by the railroad, ARB, and any other interested parties are public, except for any precautions necessary to preserve the confidentiality of trade secret or other confidential information.

Upon a final determination of non-compliance by ARB's Executive Officer (or, if appealed by the railroad, the administrative appeals panel), ARB will submit to the Board the following locomotive and railyard rulemakings:

- A regulation of switch and medium horsepower locomotives that are not preempted under federal law (e.g., locomotives that primarily operate in California and that were manufactured prior to 1973 or that exceed 133 percent of their useful life since original manufacture or last remanufacture, whichever is later).
- A designated railyard regulation that requires risk reduction audits and plans to achieve targeted emission reduction levels.

ARB will also consider the following actions:

- Pursue federal legislation to expand ARB authority to adopt regulations for in-use locomotives.
- Petition the U.S. Environmental Protection Agency (U.S. EPA) to strengthen existing federal locomotive regulations.

## 7. Further Information

The full text of the Revised 2010 Commitments for each railyard is provided in Appendices B-E of this *Supplement to the June 2010 Staff Report*, to which this FED is also appended. The documents incorporated by reference into this FED provide the history of why and how the Revised 2010 Commitments were developed. If the Revised 2010 Commitments are approved, ARB will transmit them to each railroad for concurrence and execution. Actions then can begin immediately and the 2011 emission reduction targets are effective.

### III. ENVIRONMENTAL SETTING

#### A. Existing Environment

The four high-priority railyards – BNSF San Bernardino, BNSF Hobart, UP Commerce, and UP ICTF/Dolores – are existing intermodal facilities currently operating at the identified locations within the South Coast Air Basin, which continues to experience some of the most severe air pollution in the U.S. The two UP railyards also have locomotive refueling, maintenance, and switch locomotive operations. Below is detailed discussion about the location and primary operations at each railyard.

##### 1. BNSF San Bernardino Railyard

The BNSF San Bernardino Railyard is located at 1535 West 4<sup>th</sup> Street in San Bernardino, California, and encompasses about 168 acres.<sup>14</sup> The Atchison, Topeka & Santa Fe Railroad (ATSF) San Bernardino Railyard was originally opened in November of 1885, to serve as a key ATSF terminal and locomotive maintenance facility between Kansas City and Los Angeles. The ATSF San Bernardino terminal linked with the Barstow terminal upon the completion of rail track over the Cajon Pass in 1885.<sup>15</sup> ATSF began formal intermodal operations at the San Bernardino Railyard in 1986,<sup>16</sup> and became part of BNSF Railway when ATSF merged with Burlington Northern Railroad in the mid-1990's.<sup>17</sup>

The BNSF San Bernardino Railyard is located in an area primarily zoned for commercial and manufacturing activities. However, several residential areas surround the facility, some of them within 100 feet. The railyard is divided into two distinct sections referred to as the “A” yard and the “B” yard. The “A” yard, aligned in an east - west direction, is bordered along the north side by West 4<sup>th</sup> and West 5<sup>th</sup> street, and along the south side by West 3rd Street and an adjacent main line. The “B” yard is aligned roughly in a north-south direction, and is bordered along the west side by North 8<sup>th</sup> Street. Additionally, several residential properties border the BNSF San Bernardino Railyard on the north and west side and along the south and east side of the “A” yard and the “B” yard.<sup>18</sup>

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<sup>14</sup> Air Resources Board, *Health Risk Assessment for the BNSF Railway San Bernardino Railyard*, June 2008, p. 5.

<sup>15</sup> [http://en.wikipedia.org/wiki/California\\_Southern\\_Railroad](http://en.wikipedia.org/wiki/California_Southern_Railroad). Web archive, March 16, 2011.

<sup>16</sup> Economics & Politics, Inc., *Hemet: Demographic, Economic & Quality of Life Data*, September 2005, p. 50.

<sup>17</sup> [http://en.wikipedia.org/wiki/Atchison,\\_Topeka\\_and\\_Santa\\_Fe\\_Railway](http://en.wikipedia.org/wiki/Atchison,_Topeka_and_Santa_Fe_Railway). Web archive, March 16, 2011.

<sup>18</sup> Air Resources Board, *Health Risk Assessment for the BNSF Railway San Bernardino Railyard*, June 2008, p. 5.

## 2. BNSF Hobart Railyard

The BNSF Hobart Railyard is located at 3770 East Washington Boulevard in Commerce, California, approximately 4 miles southeast of downtown Los Angeles.<sup>19</sup> BNSF Hobart Railyard is referenced as the beginning point of a mainline between Hobart and Riverside Junction built by the San Pedro Los Angeles and Salt Lake Railroad in 1901.<sup>20</sup> Intermodal operations began in 1952 on two dedicated tracks.<sup>21</sup> Atchison, Topeka & Santa Fe (ATSF) subsequently merged with BNSF Railway in the mid-1990's.<sup>22</sup>

BNSF Hobart Railyard is located in an area primarily zoned for commercial and manufacturing activities, but has several residential areas located within one mile. The BNSF Hobart Railyard encompasses approximately 243 acres, bordered by East Washington Boulevard and Sheila Street to the north, South Atlantic Boulevard to the east, the adjacent main line and East 26<sup>th</sup> Street to the south, and South Downey Road to the west. The eastern end of the BNSF Hobart Railyard is bisected by the I-710 freeway. BNSF Hobart Railyard is also located within three miles of five other major roadways, including: I-5 and Highway 60 to the north, I-110 to the west, and I-10 and Highway 101 to the northwest. The UP Commerce Railyard is located to the north of the BNSF Hobart Railyard on the other side of East Washington Boulevard.<sup>23</sup>

The BNSF Hobart Railyard generally runs from the northwest to the southeast and consists of a locomotive classification yard, intermodal areas, and administration and equipment maintenance buildings. The railyard also includes two satellite areas used for container storage and located across East 26<sup>th</sup> Street at the southwest and southeast ends of the railyard.<sup>24</sup> BNSF Hobart Railyard is supported by the small BNSF Commerce-Eastern domestic container intermodal railyard and the BNSF Sheila Mechanical facility (i.e., locomotive refueling and maintenance), which are both located about 1 to 2 miles east of BNSF Hobart Railyard.<sup>25,26,27</sup>

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<sup>19</sup> Air Resources Board, *Health Risk Assessment for the BNSF Railway Hobart Railyard*, November 2007, p. 6.

<sup>20</sup> [http://en.wikipedia.org/wiki/San\\_Pedro,\\_Los\\_Angeles\\_and\\_Salt\\_Lake\\_Railroad](http://en.wikipedia.org/wiki/San_Pedro,_Los_Angeles_and_Salt_Lake_Railroad). Web archive, March 16, 2011.

<sup>21</sup> BNSF Railway, *Los Angeles (Hobart) and Commerce BNSF Intermodal Facilities*. Informational brochure provided by BNSF to ARB, May 2010.

<sup>22</sup> [http://en.wikipedia.org/wiki/Atchison,\\_Topeka\\_and\\_Santa\\_Fe\\_Railway](http://en.wikipedia.org/wiki/Atchison,_Topeka_and_Santa_Fe_Railway). Web archive, March 16, 2011.

<sup>23</sup> Air Resources Board, *Health Risk Assessment for the BNSF Railway Hobart Railyard*, November 2007, p. 6.

<sup>24</sup> Air Resources Board, *Health Risk Assessment for the BNSF Railway Hobart Railyard*, November 2007, p. 6.

<sup>25</sup> Air Resources Board, *Health Risk Assessment for the BNSF Railway Sheila Mechanical Railyard*, November, 2007, pp. 6-7.

<sup>26</sup> Air Resources Board, *Health Risk Assessment for the BNSF Commerce Eastern Railyard*, November, 2007, p. 1.

<sup>27</sup> ENVIRON International, *Commerce-Eastern Railyard TAC Emissions Inventory*, December 2006, p. 3-1.

### 3. UP Commerce Railyard

The UP Commerce Railyard is located at 4341 East Washington Boulevard, Commerce, California, approximately 4 miles southeast of downtown Los Angeles.<sup>28</sup> The UP Commerce Railyard was originally built by the Los Angeles and Salt Lake Railroad as the “East Yard” in 1924. In the early 1990’s, UP removed the classification hump, and limited train building to flat switching, to transition more of the yard operations to intermodal.<sup>29</sup>

The UP Commerce Railyard runs directly parallel (for about a mile) and across Washington Boulevard from the BNSF Hobart Railyard. The UP Commerce Railyard covers a triangular area surrounded by both residential and commercial properties, as well as several major freeways. An overpass for the I-710 freeway bisects the UP Commerce Railyard. To the south side of the railyard (on both sides of the I-710 overpass), residences are located between the railyard fence line and Washington Boulevard. Bandini Elementary School is also located in this area, east of the I-710. The north side of the UP Commerce Railyard is surrounded by commercial properties and residential housing. Residential properties are located north of the railyard on both sides of the I-710 freeway overpass, approximately 200 feet from the railyard.<sup>30</sup>

Facilities within the railyard include: classification tracks, a gate complex for inbound and outbound intermodal truck traffic, intermodal loading and unloading tracks, a locomotive service track, a locomotive maintenance shop, a freight car repair shop, an on-site wastewater treatment plant, and various buildings and facilities supporting railroad and contractor operations.<sup>31</sup>

### 4. UP ICTF/Dolores Railyards

The UP ICTF/Dolores Railyards are located in Long Beach and Carson, California, about 4 miles north of the Port of Long Beach.<sup>32</sup> The UP ICTF intermodal railyard, a near dock facility leased from the San Pedro Ports, was opened in 1986. The Dolores Railyard was built during World War II (1943) by Pacific Electric Railroad to accommodate growing movements and storage of war-related freight traffic to and from the San Pedro harbor.<sup>33</sup>

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<sup>28</sup> Air Resources Board, *Health Risk Assessment for the Union Pacific Railroad Commerce Railyard*, November 2007, p. 6.

<sup>29</sup> Solomon, Brian, *Union Pacific Railroad*, 2000, pp. 69-70.

<sup>30</sup> Air Resources Board, *Health Risk Assessment for the Union Pacific Railroad Commerce Railyard*, November 2007, p. 6.

<sup>31</sup> Air Resources Board, *Health Risk Assessment for the Union Pacific Railroad Commerce Railyard*, November 2007, p. 6.

<sup>32</sup> Air Resources Board, *Health Risk Assessment for the UP Intermodal Container Transfer Facility (ICTF) and Dolores Railyards*, April 2008, p. 6.

<sup>33</sup> <http://www.erha.org/pesspd.htm>. Web archive, March 16, 2011.

The UP ICTF/Dolores facility has two railyards, (1) the ICTF intermodal yard to the east, and (2) Dolores flat switching and servicing yard to the northwest. ICTF covers a narrow area between East Sepulveda Boulevard and East 233<sup>rd</sup> Street, just south of the I-405 freeway. The main portion of the Dolores Yard covers a narrow area approximately one-half mile in length along the Alameda Corridor, connected to ICTF with a series of parallel tracks approximately 1.4 miles long on the north end and 0.9 miles long on the south end.<sup>34</sup>

The general land uses on the west, south, and north sides of the facility are commercial and industrial. There are three major refineries located within about one mile of the railyard boundaries: BP Carson Refinery, ConocoPhillips Refinery, and Shell Refinery (purchased by Tesoro in 2007). A number of industrial storage facilities are located to the southwest. An overpass of the I-405 freeway passes over the south end of the Dolores Yard. Between the eastside of the facility and the I-710 freeway (approximately one mile from the facility boundary) is a residential area. The nearest residences are approximately 100 to 400 feet from the eastern boundary of both railyards.<sup>35</sup>

## 5. Existing Air Quality

At these four high-priority railyards, UP and BNSF process shipments of international and/or domestic freight that may be transported by ship, locomotive, and/or truck to destinations within or outside California. The railroads rely primarily on diesel-powered engines in locomotives, trucks, and cargo handling equipment at the railyards to transfer and transport the freight. These sources emit diesel PM, oxides of nitrogen (NOx), sulfur oxides (SOx), hydrocarbons (HC) or volatile organic compounds (VOC), greenhouse gases and other climate change contributors. The NOx and HC emissions combine in the atmosphere in the presence of sunlight to form high regional levels of ozone, while the diesel PM, NOx, SOx, and HC emissions also contribute to high regional levels of fine particulate matter that is 2.5 microns or less in diameter (PM2.5).

All four railyards are located in the South Coast Air Basin. The South Coast Air Basin is the nation's second largest urban area and California's largest metropolitan region. It includes the southern two-thirds of Los Angeles County, all of Orange County, and the western, urbanized portions of Riverside and San Bernardino counties. The South Coast Air Basin is home to 16 million people, about 40 percent of the State's population. The South Coast Air Basin is also home to over 10 million vehicles.

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<sup>34</sup> Air Resources Board, *Health Risk Assessment for the UP Intermodal Container Transfer Facility (ICTF) and Dolores Railyards*, April 2008, p. 6.

<sup>35</sup> Air Resources Board, *Health Risk Assessment for the UP Intermodal Container Transfer Facility (ICTF) and Dolores Railyards*, April 2008, p. 6.

*a. Regional Air Pollution*

Some of the nation's highest concentrations of PM<sub>2.5</sub> and ozone occur in the South Coast Air Basin despite decades of increasingly stringent air pollution controls. The South Coast Air Basin is one of two federal PM<sub>2.5</sub> non-attainment areas in the State, and the most serious in the nation. Its ozone levels are currently 50 percent above the federal standard, making it the nation's worst ozone area. The Basin also violates the State's ambient air quality standards for ozone, PM<sub>2.5</sub>, PM<sub>10</sub>, and nitrogen dioxide; a few areas of the Basin violate the State's ambient air quality standard for lead.<sup>36</sup>

*b. Air Toxics and Cancer Risk*

The directly emitted diesel PM contributes to an increased localized risk of cancer and non-cancer effects, including premature death, cardiac disease, and respiratory illnesses like asthma and bronchitis. Based on air quality monitoring from 2004-2006, the South Coast Air Quality Management District estimated that the carcinogenic risk from air toxics in the basin is about 1,200 chances per million, with diesel exhaust accounting on average for about 84 percent of the total.<sup>37</sup> The increased risk of cancer is based on constant exposure to diesel PM over a 70-year lifetime, the standard methodology for estimating cancer risk from air toxics. With the same exposure assumptions, the maximum excess cancer risk in the most impacted neighborhoods from operations at the four high-priority railyards ranges from 500 to 2,500 in a million for calendar year 2005, decreasing to 180 to 650 in a million for calendar year 2010.

**B. Regulatory Setting**

1. Regulations

*a. Federal Standards for Locomotive Emissions*

Under the Clean Air Act, U.S. EPA has the sole authority to regulate emissions from newly manufactured, as well as remanufactured locomotives and locomotive engines. Federal standards have been adopted by the U.S. EPA in two regulatory actions.<sup>38</sup>

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<sup>36</sup> Air Resources Board, 2010 Area Designations, <http://www.arb.ca.gov/desig/adm/adm.htm>. Web archive, May 5, 2011

<sup>37</sup> South Coast Air Quality Management District, *MATES-III - Final Report Multiple Air Toxics Exposure Study in the South Coast Air Basin*, September 2008, Executive Summary.

<sup>38</sup> ARB's authority to directly regulate locomotives is limited. To determine the extent of the ARB's authority to adopt emission standards for railyard sources, including locomotives, one must carefully consider ARB's authority in relation to the authority granted to ARB under the Health and Safety Code and the CAA and the constraints imposed by the preemptions of state regulation under the CAA and the Interstate Commerce Commission Termination Act of 1995 (ICCTA). A more detailed discussion of ARB's authority over locomotives is set forth in Appendix A of the Air Resources Board's *Recommendations Document* and at Chapter VI, Section D.1., *infra*.



- *Tier 0-2 standards:* The first emission regulations for locomotives were adopted on December 17, 1997.<sup>39</sup> The rulemaking, which became effective in 2000, applies to locomotives originally manufactured since 2000, and is also applicable to 1973-1999 model year locomotives any time they are remanufactured. Tier 0-2 standards have been met through engine design methods, without the use of aftertreatment (emission controls – like a diesel PM filter – that capture the engine exhaust and reduce the air pollutants before releasing it to the atmosphere).
- *Tier 3-4 standards:* A regulation signed on March 14, 2008 introduced more stringent emission requirements. Tier 3 standards will be met by engine design methods and will become effective in 2011 and 2012. Tier 4 standards will become effective in 2015. Locomotive manufacturers may need to incorporate aftertreatment technologies to meet the Tier 4 standards, but the standard does not require aftertreatment. The 2008 regulation also includes more stringent emission standards for remanufactured Tier 0-2 locomotives.<sup>40</sup>

Table F-2 below shows the level of stringency of each established U.S. EPA locomotive emission standard in grams of pollutant per brake horsepower-hour (g/bhp-hr) and the associated percent reduction compared to uncontrolled, pre-Tier 0 emission levels, for NO<sub>x</sub>, PM, and HC.<sup>41</sup> The standards and test procedures are different for the two primary types of locomotives – the smaller switch locomotives that are typically assigned to a specific railyard to move railcars around to assemble trains, and the larger, more powerful line haul locomotives that move entire trains longer distances. ARB also refers to a third type of locomotive – a medium horsepower locomotive – that applies primarily to former older interstate line haul locomotives that were cascaded down from national to regional or local service to perform as train helpers over mountains, short haulers, or in some cases as yard switch locomotives. These medium horsepower locomotives are subject to the line haul emission standards shown below.

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<sup>39</sup> Federal Register, Volume 63, Number 73, pp. 18997-19084, April 16, 1998.

<sup>40</sup> Federal Register, Volume 73, Number 126, pp. 37095-37144, June 30, 2008.

<sup>41</sup> Title 40, Code of Federal Regulations, Part 1033.101, a.

**Table F-2**  
**Federal Locomotive Emission Standards and Percent Control<sup>42,43</sup>**

<b>Line Haul Locomotives</b>							
Emission Tier	Year of Manufacture	NOx		PM		HC	
		Standard (g/bhp-hr)	Percent Control	Standard (g/bhp-hr)	Percent Control	Standard (g/bhp-hr)	Percent Control
Pre-Tier 0	1973-1999	13.5*	n/a	0.6**	n/a	1.0	n/a
Tier 0	2000-2001	9.5	30	0.6	0	1.0	0
Tier 1	2002-2004	7.4	45	0.45	25	0.55	45
Tier 2	2005-2011	5.5	59	0.2	67	0.3	70
Tier 3	2012-2014	5.5	59	0.1	83	0.3	70
Tier 4	2015	1.3	90	0.03	95	0.14	86
<b>Switch Locomotives</b>							
Emission Tier	Year of Manufacture	NOx		PM		HC	
		Standard (g/bhp-hr)	Percent Control	Standard (g/bhp-hr)	Percent Control	Standard (g/bhp-hr)	Percent Control
Pre-Tier 0	1973-1999	17.4*	n/a	0.72**	n/a	2.1	n/a
Tier 0	2000-2001	14.0	20	0.72	0	2.1	0
Tier 1	2002-2004	11.0	37	0.54	25	1.2	43
Tier 2	2005-2011	8.1	53	0.24	67	0.6	71
Tier 3	2012-2014	5.0	71	0.1	86	0.6	71
Tier 4	2015	1.3	93	0.03	96	0.14	93

\* U.S. EPA Locomotive Emissions Standards – Regulatory Support Document – p. 96 – Estimated NOx Emission Rates.

\*\* ARB staff assumed older pre-Tier 0 line haul and switch locomotives would be able to emit up to the Tier 0 PM emission standards, based on American Association of Railroads in-use emission testing (required to comply with U.S. EPA in-use emission testing requirements) for older switch locomotives with EMD 645 engines.

The 2008 U.S. EPA rule will cut locomotive PM and NOx emissions by as much as 90 percent from uncontrolled levels when fully implemented, reducing annual emissions of NOx by about 800,000 tons and PM emissions by 27,000 tons. These emission reductions will continue to grow beyond 2030 as fleet turnover is completed. U.S. EPA estimates that national locomotive fleet turnover can take up to 30 years or more.<sup>44</sup>

<sup>42</sup> Title 40, Code of Federal Regulations, Part 1033.101, a.

<sup>43</sup> U.S. EPA Fact Sheet EPA-420-F-09-025, April 2009.

<sup>44</sup> U.S. EPA, *Regulatory Announcement: EPA Finalizes More Stringent Emissions Standards for Locomotives and Marine Compression-Ignition Engines*, EPA420-F-08-004, March 2008, p. 4.

*b. California Authority to Regulate Locomotive Emissions*

To determine the extent of the ARB's authority to adopt emission standards for railyard sources, including locomotives, one must carefully consider ARB's authority in relation to the authority granted to ARB under the Health and Safety Code and the CAA and the constraints imposed by the preemptions of State regulation under the CAA and the Interstate Commerce Commission Termination Act of 1995 (ICCTA). These are summarized briefly below, and discussed in detail in Appendix A of the *Recommendations Document*.<sup>45</sup>

To the extent that ARB has authority under the CAA to adopt emission standards for locomotives manufactured prior to 1973, and non-new locomotives that have exceeded 133 percent of their useful lives, that authority must be harmonized with the purposes and intent of the ICCTA preemption. Harmonization involves a factual inquiry. Based on the facts and rationale summarized below, ARB staff believes that ARB likely possesses authority to establish emission standards for pre-2000 model-year switch and medium horsepower locomotives, that have not been subsequently remanufactured to meet U.S. EPA emissions standards, and that principally operate in intrastate service. On balance, given the strong federal directives under the CAA to achieve attainment of national ambient air quality standards (NAAQS) and the express authority given to California to regulate non-preempted locomotives, the limited regulation of such intrastate locomotives would seem to outweigh any potential undue impairment to railroad operations.

ARB has authority under the CAA to adopt standards for all CAA non-preempted locomotives. To the extent that switch and medium horsepower locomotives are not preempted under the CAA, ARB has authority under California law to adopt emission standards for these in-use locomotives, but must receive authorization from U.S. EPA pursuant to CAA Section 209 (c)(2). Additionally, such regulations must be harmonized with the purposes and intent of the ICCTA preemption.<sup>46</sup> Whether these locomotives are preempted under ICCTA is a factual question.

In contrast to intrastate switch and medium horsepower locomotives, locomotives that are engaged in line haul interstate operations may be preempted under the CAA in that they were likely manufactured on or after 1973 and are within 133 percent of their useful lives since initial manufacture or subsequent remanufacture. To the extent that they are not preempted under the CAA, it could be argued that the interstate nature of these

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<sup>45</sup> Air Resources Board, *Recommendations to Implement Further Locomotive and Railyard Emission Reductions*, September 2009. (<http://www.arb.ca.gov/railyard/ted/drftrec090909.pdf>)

<sup>46</sup> See *Association of American Railroads (AAR) v. the South Coast Air Quality Management District* (9<sup>th</sup> Cir. 2010) 622 F.3d 1094, 1098; See also *New York Susquehanna & Western Railway Corporation v. Jackson (Jackson)* 500 F.3d 238, 253.

locomotives makes adoption of State emission standards unduly burdensome to railroad operations and, therefore, preempted under ICCTA.

In summary, ARB staff recognizes that its authority to regulate locomotives and other sources under California law is circumscribed in varying degrees by the CAA and ICCTA. To the extent that ARB has authority to adopt regulations under the CAA, its authority must be harmonized with the ICCTA preemption.

*c. California Emission Standards for Other Railyard Sources*

ARB has adopted and implemented other regulations that affect diesel sources operating at railyards. The existing measures include the ARB regulations for cargo handling equipment, drayage trucks, transport refrigeration units, and clean diesel fuel.

2. Voluntary Enforceable Agreements

UP Railroad and BNSF Railway have entered into two enforceable agreements with ARB to further reduce emissions in California. The 1998 ARB/Railroads Agreement<sup>47</sup> (often referred to as the Fleet Average Agreement) requires that, by January 1, 2010, NOx emissions from all locomotives operating in the South Coast Air Basin, on average, be equivalent to the lowest emitting line haul locomotives available for purchase in that year (U.S. EPA Tier 2). Under this Agreement, locomotive NOx emissions in the South Coast Air Basin have been reduced by about 67 percent.<sup>48</sup>

The 2005 Agreement<sup>49</sup> with UP and BNSF obligates the railroads to significantly reduce diesel emissions in and around railyards in California. Among the most important elements of the 2005 Agreement are provisions that will significantly clean up the State's biggest railyards, including:

- Health risk assessments for all major railyards,
- Installation of idle reduction devices on intrastate locomotives,
- Dispensing low sulfur fuel in California,
- Adopting a stringent visual emission reduction and repair program,
- Compliance with annual reporting requirements, and
- Community and air district involvement in the preparation of risk assessments, enforcement of Agreement provisions, and the evaluation and development of measures to further reduce impacts on local communities.

ARB estimates that, as a result of the 2005 Agreement, about 400 intrastate locomotives have been equipped with automatic shutdown devices (99 percent of the

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<sup>47</sup> ARB, *Memorandum of Mutual Understandings and Agreements, South Coast Locomotive Fleet Average Emission Program*, July 1998.

<sup>48</sup> *Federal Register*, Vol. 64, No. 108, p. 30279, July 7, 1999.

<sup>49</sup> ARB, *ARB/Railroad Statewide Agreement, Particulate Emissions Reduction Program at California Railyards*, June 2005.

intrastate fleet), at least 95 percent of the fuel purchased by the railroads has been low-sulfur fuel, and that at least 99 percent of all units in California are complying with stringent smoke limits. ARB staff provided multiple updates to the Board since 2005 reporting that both UP Railroad and BNSF Railway were on or ahead of schedule to meet all aspects of the 2005 Agreement.

In addition to the two formal agreements, ARB and local air districts have enforceable grant contracts with the railroads to use incentive funds to replace or upgrade existing locomotives with cleaner technology, and to operate those cleaner locomotives for a specified time period (typically 15 years) with a defined region.

## IV. IMPACT ANALYSIS

### A. Introduction

This chapter presents ARB's analysis of potential impacts on the physical environment that may result from ARB's approval and implementation of the Revised 2010 Commitments. The proposed project's primary purpose is to improve the existing air quality environment surrounding the covered railyards (as described under *Project Objective*) by implementing a binding voluntary agreement whereby the railroads would employ technological changes and/or strategic operational changes. The Revised 2010 Commitments set specific emission reduction performance standards, but do not require any specific actions by the railroads, such as certain equipment upgrades or movement of an activity to another location within the railyard. The railroads may use any combination of technology and/or operational changes to meet the standards. Such changes are at the discretion of the railroads.

The execution and implementation of these Revised 2010 Commitments does not directly and adversely affect the physical environment. CEQA requires, however, an analysis of a project to include any reasonably foreseeable *indirect* physical changes in the environment that may occur as a result of the project.<sup>50</sup> Therefore, this analysis focuses on the environmental consequences potentially resulting from the actions that the railroads may take to comply with Commitments.

The future actions the railroads may choose to take cannot be definitively predicted at this time, as it is at the discretion of the railroads to undertake or not to undertake any operational changes to meet the emission reduction targets. Although CEQA discourages forecasting and speculation, drafting an environmental document necessarily involves some degree of forecasting. ARB has used its best efforts to find out and disclose all that it reasonably can, and this analysis provides as much information as is currently available, without being speculative.

During evaluation of the environmental checklist topics, staff determined that operational changes (as described under *Project Description*) that the railroads will assess and may implement to meet the emission reduction targets (or to reduce railyard health risk without reducing emissions) have the potential to result in changes to the physical environment in the vicinity of the railyards. Staff identified three resource areas that warranted further discussion in this chapter of the FED. The FED checklist in Attachment 1 provides a brief explanation supporting the determination for each of the other resource areas that the project will have no impact.

This analysis of the indirect impacts of complying with the Revised 2010 Commitments is necessarily general and programmatic in nature. The degree of specificity required in a CEQA document corresponds to the degree of specificity inherent in the underlying

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<sup>50</sup> CEQA Guidelines, Article 5, §15064(d)(2) and (d)(3).

activity that it describes.<sup>51</sup> The analysis of the indirect effects of the Revised 2010 Commitments need not, and cannot be, as detailed as for specific plans and projects.<sup>52</sup> A more detailed analysis is not reasonably feasible at this time because specific compliance projects are not authorized by the adoption of the Commitments and it is unknown what specific future actions will be undertaken at each railyard to meet the emission reduction targets as any changes are at the discretion of the railroads. Because ARB regulations require ARB's functional equivalent document to describe both potentially beneficial and potentially adverse effects of its proposed actions, this discussion includes a discussion of potential beneficial impacts.<sup>53</sup>

This chapter also includes a description of the environmental setting (existing conditions) for each of the resource areas analyzed at each of the four high-priority yards. The environmental setting is used as the baseline for comparison of potential changes resulting from implementation of the project and determining impact significance.

## **B. Beneficial Effects**

Although the primary focus of conventional CEQA impact assessment is identification and disclosure of adverse environmental impacts, ARB's regulations require the assessment of both beneficial and adverse environmental impacts.<sup>54</sup> The Revised 2010 Commitments establish the level of emissions for future years that cannot be exceeded regardless of growth in cargo or railyard activity. These levels are based on a specific percent reduction from established 2005 emissions. The railroads will accelerate the use of cleaner technology, possibly in combination with operational improvements, to achieve the required emission reductions at each railyard. These actions will help reduce the health risk in communities near the railyards.

In this analysis of the potential environmental impacts of the Revised 2010 Commitments, data for calendar year 2010 represent the existing conditions. We also routinely provide calendar year 2005 numbers for consistency with other documents because ARB developed the Revised 2010 Commitments in response to the results of health risk assessments performed for calendar year 2005 rail operations. The Revised 2010 Commitments themselves use 2005 as the benchmark for setting emissions targets and measuring progress.

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<sup>51</sup> CEQA Guidelines, §15146.

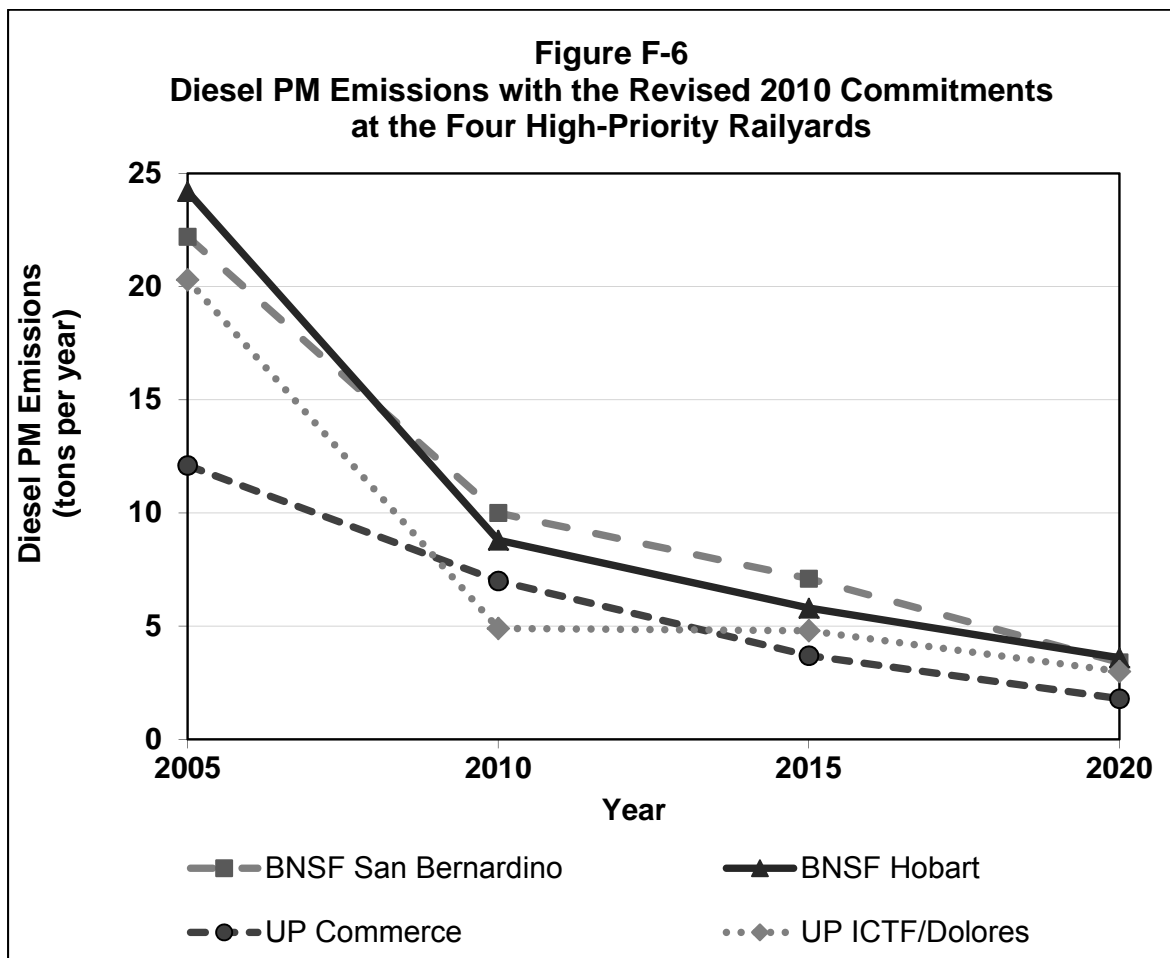
<sup>52</sup> CEQA Guidelines, §15146.

<sup>53</sup> Title 17, California Code of Regulations, §60005.

<sup>54</sup> Title 17, California Code of Regulations, §60005.

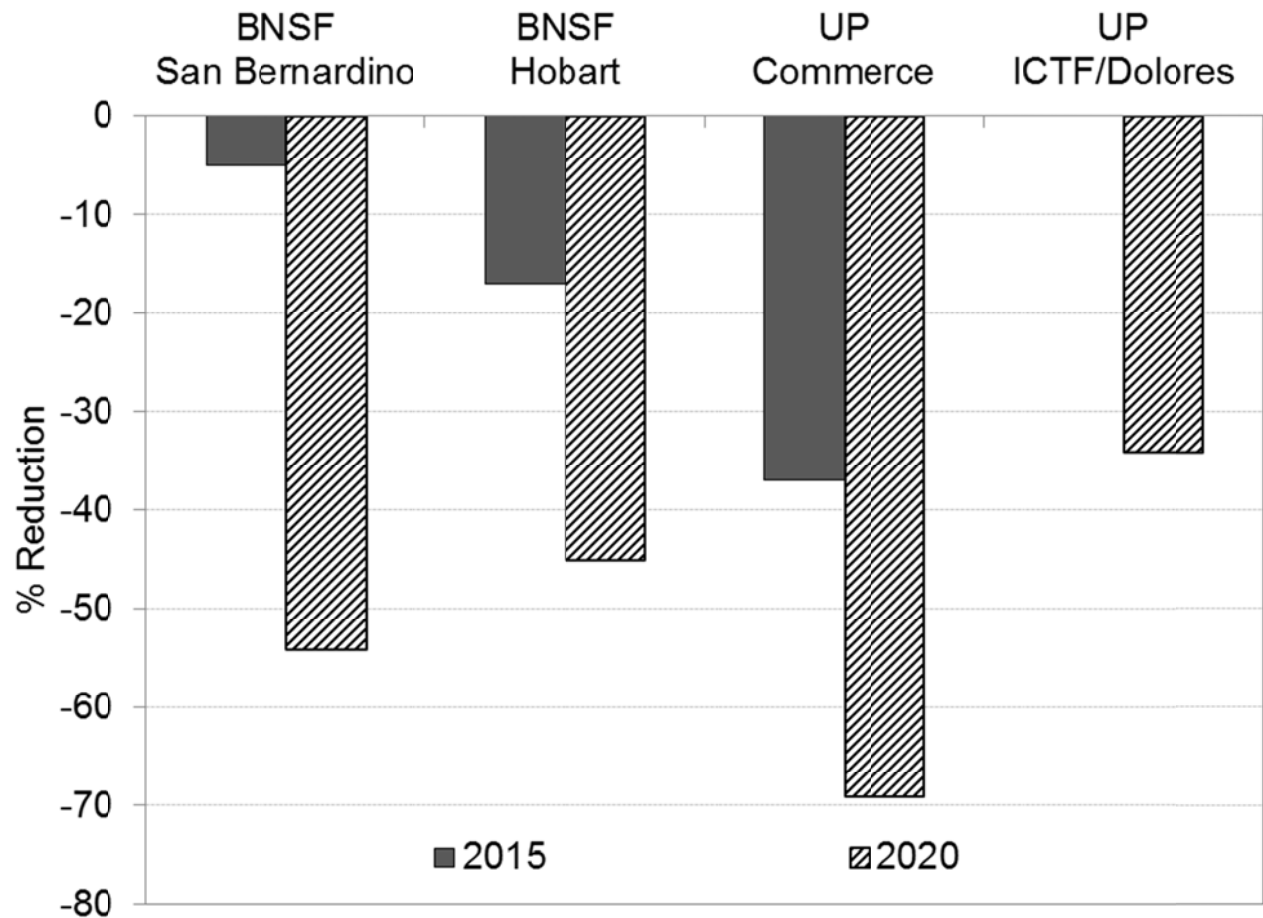
## 1. Emission Reductions

Appendix A provides a detailed discussion of ARB's current estimates of diesel PM emissions at each of the four high-priority railyards and expected reductions from both the existing program (adopted ARB and U.S. EPA regulations and agreements) and the Revised 2010 Commitments. Figure F-6 summarizes the net impact of the existing program of adopted U.S. EPA and ARB regulations and agreements plus the Revised 2010 Commitments on emissions at each yard. Figure F-7 graphically illustrates the expected benefits attributable to the Revised 2010 Commitments alone, based on the projected cargo growth levels. Tables F-3 through F-6 provide the numbers used to derive the benefits attributable to the Revised 2010 Commitments at each yard (for further detail, please see Appendix A to this report). The actual benefits realized may change if growth is greater or less than projected.





**Figure F-7**  
**Percent Diesel PM Reduction Attributable to the**  
**Revised 2010 Commitments in 2015 and 2020**



**Table F-3**  
**BNSF San Bernardino Railyard**  
**Diesel PM Emissions**  
(tons per year)

	2005	2010	2015	2020
Existing Program	22.2	10.0	7.5	7.3
Existing Program + Commitments	N/A	N/A	7.1	3.4
Reductions Attributable to the Commitments in Future Year	N/A	N/A	-0.4	-3.9
Percent Reduction Attributable to the Commitments in Future Year	N/A	N/A	5%	53%

**Table F-4**  
**BNSF Hobart Railyard**  
**Diesel PM Emissions**  
(tons per year)

	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Existing Program	24.2	8.8	7.0	6.6
Existing Program + Commitments	N/A	N/A	5.8	3.6
Reductions Attributable to the Commitments in Future Year	N/A	N/A	-1.2	-3.0
Percent Reduction Attributable to the Commitments in Future Year	N/A	N/A	17%	45%

**Table F-5**  
**UP Commerce Railyard**  
**Diesel PM Emissions**  
(tons per year)

	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Existing Program	12.1	7.0	5.9	5.8
Existing Program + Commitments	N/A	N/A	3.7	1.8
Reductions Attributable to the Commitments in Future Year	N/A	N/A	-2.2	-4.0
Percent Reduction Attributable to the Commitments in Future Year	N/A	N/A	37%	69%

**Table F-6**  
**UP ICTF/Dolores Railyards**  
**Diesel PM Emissions**  
(tons per year)

	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Existing Program	20.3	4.9	4.8	4.6
Existing Program + Commitments	N/A	N/A	4.8	3.0
Reductions Attributable to the Commitments in Future Year	N/A	N/A	0	-1.6
Percent Reduction Attributable to the Commitments in Future Year	N/A	N/A	0%	35%

## 2. Health Risk Reductions

The 2005 Agreement<sup>55</sup> required that health risk assessments (HRAs) be prepared for each of the 17 major or designated railyards in the State. These HRAs were completed in 2007 and 2008, using emission inventories for railyard operations in 2005. The HRAs yield the maximum individual cancer risk (MICR), which is defined as the estimated probability of a potential maximally exposed individual contracting cancer as a result of exposure to toxic air contaminants. The exposure is over a period of 70 years for residential receptor locations, and 40 years for worker receptor locations.

Diesel-related emissions are lower today than in 2005 due to the benefits of ARB's statewide regulations for drayage trucks,<sup>56</sup> cargo handling equipment,<sup>57</sup> transport refrigeration units,<sup>58</sup> and locomotive fuels,<sup>59</sup> as well as the 1998 Agreement<sup>60</sup> and the 2005 Agreement<sup>61</sup> with BNSF and UP to reduce air pollution from rail activities. However, despite the above regulations and agreements, the diesel PM emissions from railyard emission sources continue to pose a significant health risk today to people who live near the four high-priority railyards.

The *June 2010 Staff Report* contains a discussion of the current and projected diesel PM emissions and health risks from each railyard, based on extensive earlier work done by the railroads to develop an inventory of diesel PM emissions for each railyard, and work done by ARB staff to assess the associated health risk at each railyard. The Inventories and the HRAs provide detailed data on the conditions at each railyard during the 2005 calendar year (see *Incorporation of Documents by Reference* in Chapter I). Appendix A updates the emissions, cancer risk, and population exposure estimates for 2010, which establishes the existing conditions for this environmental analysis.

The Revised 2010 Commitments require reductions in diesel PM emissions, which will have a direct and nearly proportional impact on the related cancer and health risk from exposure to those emissions. Staff has already established the relationship between emissions and the resulting excess cancer risk based on the site-specific conditions at each of the four high-priority railyards in the Health Risk Assessments. In the Revised 2010 Commitments, staff used emissions as a surrogate for health risk, since emissions can be most readily tracked.

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<sup>55</sup> ARB/Railroad Statewide Agreement, *Particulate Emissions Reduction Program at California Rail Yards*, June 2005. <http://www.arb.ca.gov/railyard/ryagreement/083005mouexecuted.pdf>

<sup>56</sup> Title 13, California Code of Regulations, §2027. New section filed November 24, 2008, operative December 24, 2008.

<sup>57</sup> Title 13, California Code of Regulations, §2479. New section filed and operative December 1, 2006.

<sup>58</sup> Title 13, California Code of Regulations, Article 8 §2477. New article and section filed November 10, 2004, operative December 10, 2004.

<sup>59</sup> Title 13, California Code of Regulations, §2282-2285. Amendment filed July 15, 2004, operative August 14, 2004.

<sup>60</sup> *Memorandum of Mutual Understandings and Agreements, South Coast Locomotive Fleet Average Emissions Program*, July 2, 1998. [http://www.arb.ca.gov/msprog/offroad/loco\\_flt.pdf](http://www.arb.ca.gov/msprog/offroad/loco_flt.pdf)

<sup>61</sup> ARB/Railroad Statewide Agreement, *Particulate Emissions Reduction Program at California Rail Yards*, June 2005.

Table F-7 presents a summary of significant reductions in the projected maximum excess cancer risk expected after implementation of both the Revised 2010 Commitments and the existing program of already adopted ARB and U.S. EPA regulations and agreements. The 2005 Health Risk Assessments for each railyard established the relationship between emissions, location, meteorology, and the resulting exposure and cancer risk to nearby communities. With the exception of the BNSF San Bernardino Railyard, this analysis assumes that changes to the maximum excess cancer risk for future railyard operations are directly proportional to changes in total diesel PM emissions. For BNSF San Bernardino, the 2005 Health Risk Assessment used a source-weighted approach that accounts for the relative impact of diesel PM from each type of emissions source based on its location and proximity to residents. We use that same approach to estimate the current and future risk for this railyard. Because 2010 represents the existing conditions for this proposed project, we show the percent reduction between this year and 2020, unlike Appendix A that displays the changes between 2005 and 2020.

**Table F-7**  
**Reduction in Diesel PM Health Risk with the Revised 2010 Commitments**  
**at the Four High-Priority Railyards**

Railyard	Maximum Individual Cancer Risk for 70-Year Exposure (chances per million)				
	2005	2010 (existing condition)	2015	2020	Reduction (from 2010 to 2020)
BNSF San Bernardino*	2,500	650	500	275	-58%
BNSF Hobart	500	180	120	75	-58%
UP Commerce	500	290	155	75	-74%
UP ICTF/Dolores	800	190	180	120	-37%

\* Risk estimates for BNSF San Bernardino Railyard consider the source and location of the diesel PM emissions within the railyard in each year, consistent with the method used to develop the 2005 numbers.

Table F-8 through F-11 provide the details for each railyard to compare the cancer risk and number of people exposed with and without the Revised 2010 Commitments. These tables below show that in 2020, the Revised 2010 Commitments would cut the remaining risk by an additional 30-70 percent, compared to the risk under the existing program in the same year. They would also reduce the number of people exposed to a cancer risk greater than 10 in a million in 2020 by an additional 80-92 percent beyond the existing program. Just as the Revised 2010 Commitments will reduce the diesel PM emissions and cancer risk at the railyards, they will also reduce the non-cancer health impacts.

**Table F-8**  
**BNSF San Bernardino Railyard**  
**Estimated Maximum Individual Cancer Risk and Population Exposure**

	<b>Excess Maximum Individual Cancer Risk for 70-Year Exposure*</b> (chances per million)			
	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Existing Program	2,500	650	510	400
Existing Program + Commitments	N/A	650	500	275
Percent Reduction in Future Year	N/A	N/A	2%	31%
	<b>Number of People Exposed to a Risk &gt;10 in a Million</b>			
Existing Program	350,000	187,000	140,000	137,000
Existing Program + Commitments	N/A	187,000	135,000	69,000
Percent Reduction in Future Year	N/A	N/A	4%	50%

\* Estimated cancer risk considers the source and location of the diesel PM emissions within the railyard.

For BNSF San Bernardino, if you compare the rate of reduction in cancer risk over time (Table F-8) to the rate of reduction of diesel PM emissions (Table F-3), you will notice that risk decreases faster than emissions in the earlier years and slower in the out years. This is because the diesel PM emission sources that achieved substantial reductions by 2010 are also the emission sources with the greatest impact on health risk because of their proximity to nearby residents. Drayage trucks, cargo handling equipment, and transport refrigeration units achieved the bulk of their emission reductions by 2010 –these same sources typically have the highest health impact and reduction per unit of emissions because of their proximity to residents.

**Table F-9  
BNSF Hobart Railyard  
Estimated Maximum Individual Cancer Risk and Population Exposure**

	<b>Excess Maximum Individual Cancer Risk for 70-Year Exposure (chances per million)</b>			
	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Existing Program	500	180	145	140
Existing Program + Commitments	N/A	180	120	75
Percent Reduction in Future Year	N/A	N/A	17%	46%
	<b>Number of People Exposed to a Risk &gt;10 in a Million</b>			
Existing Program	848,000	281,000	240,000	223,000
Existing Program + Commitments	N/A	281,000	192,000	110,000
Percent Reduction in Future Year	N/A	N/A	20%	51%

**Table F-10  
UP Commerce Railyard  
Estimated Maximum Individual Cancer Risk and Population Exposure**

	<b>Excess Maximum Individual Cancer Risk for 70-Year Exposure (chances per million)</b>			
	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Existing Program	500	290	245	240
Existing Program + Commitments	N/A	290	155	75
Percent Reduction in Future Year	N/A	N/A	37%	69%
	<b>Number of People Exposed to a Risk &gt;10 in a Million</b>			
Existing Program	270,000	178,000	140,000	136,000
Existing Program + Commitments	N/A	178,000	67,000	22,000
Percent Reduction in Future Year	N/A	N/A	52%	84%

**Table F-11**  
**UP ICTF/Dolores Railyards**  
**Estimated Maximum Individual Cancer Risk and Population Exposure**

	<b>Excess Maximum Individual Cancer Risk for 70-Year Exposure (chances per million)</b>			
	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Existing Program	800	190	180	180
Existing Program + Commitments	N/A	190	180	120
Percent Reduction in Future Year	N/A	N/A	0%	33%
	<b>Number of People Exposed to a Risk &gt;10 in a Million</b>			
Existing Program	600,000	156,000	143,000	123,000
Existing Program + Commitments	N/A	156,000	143,000	65,500
Percent Reduction in Future Year	N/A	N/A	0%	47%

### 3. Pollutants Other Than Diesel PM

ARB staff qualitatively assessed the potential for implementation of the Revised 2010 Commitments to affect emissions of pollutants other than diesel PM at the high-priority railyards. Because locomotives account for the majority of the diesel PM emissions at the high-priority railyards (see Appendix A to this *Supplement to the June 2010 Staff Report*), they will also need to be the primary source of new emission reductions to meet the declining levels. For example, ARB staff previously identified a potential path to achieve the diesel PM emission reduction levels at the BNSF San Bernardino Railyard. This path relies on transition of the entire fleet of switch locomotives assigned to the railyard from Tier 0 to Tier 3 and then Tier 4 levels. For line haul locomotives, the path relies on the transition from the current Tier 2 average levels to 100 percent Tier 4 levels.

Table F-2 shows the federal locomotive emission standards for each regulated pollutant. At the four high-priority railyards, the existing baseline for locomotives is Tier 0 or better since the railroads have discontinued routine use of the uncontrolled, pre-Tier 0 locomotives at these yards (as documented by ARB staff field surveys). As the railroads replace older locomotives or upgrade the engines in those locomotives to Tier 4 levels to meet the diesel PM levels required by the Revised 2010 Commitments, those actions will simultaneously reduce PM, NO<sub>x</sub>, and HC by about 85-95 percent compared to Tier 0 levels.

For the sulfur oxides (SO<sub>x</sub>) that contribute to fine particle pollution, ARB staff expects the impact of the Revised 2010 Commitments to be neutral or beneficial due to use of

more fuel-efficient switch locomotives. The significant reductions in SOx emissions from railyard operations occurred earlier this decade when ARB's regulations for low sulfur diesel fuel in all land-based sources went into effect. For greenhouse gases and other pollutants that contribute to climate change, Section VII of the Checklist (see Attachment 1) discusses why staff expects the Revised 2010 Commitments to have a neutral or beneficial impact.

#### 4. Benefits in Other Communities

In response to the Revised 2010 Commitments, ARB staff expects that the railroads will target introduction of the newest, cleanest line haul locomotives to provide interstate service between California and points east, while the cleanest switch locomotives will be operated at the four high-priority railyards or within the region. Based on staff experience with the 1998 ARB/Railroads Locomotive NOx Fleet Average Agreement in the South Coast Air Basin (1998 Agreement), staff anticipates that communities across the State that are not near the four high-priority railyards would receive about 15 percent of the benefits from the lower-emission locomotives brought in to meet the emission levels at the high-priority railyards.<sup>62</sup>

### **C. Potential Adverse Impacts**

This analysis specifically focuses on potential significant, adverse impacts on the physical environment in the context of potential changes from the existing environmental conditions at each of the four high-priority railyards subject to the Revised 2010 Commitments. The analysis includes a description of the physical environmental conditions in the vicinity of the project as they exist at the time the analysis was commenced.<sup>63</sup> ARB has identified three areas of potentially significant adverse impacts that might result from the Revised 2010 Commitments: aesthetics (light), noise, and transportation and traffic. (See Checklist in Attachment 1.)

#### 1. Aesthetics

This section contains a description of the environmental setting and potential impacts associated with implementation of the Revised 2010 Commitments with respect to Aesthetics. Staff identified the potential only for the creation of a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

##### *a. Environmental Setting*

The four high-priority railyards are in continuous operation under well-lighted conditions, 24 hours a day, seven days a week. Under existing conditions, there is substantial nighttime light and glare from fixed lighting sources.

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<sup>62</sup> June 2010 Staff Report, p. 19.

<sup>63</sup> CEQA Guidelines, Article 9, §15125.



i. BNSF San Bernardino Railyard

The vicinity around the BNSF San Bernardino Railyard includes commercial, industrial, and heavy industrial operations (e.g., warehousing and servicing facilities, etc.) that involve substantial lighting. The lighting standards at the BNSF San Bernardino Railyard are guided by local planning documents, safety requirements, and industry best management practices. The BNSF San Bernardino Railyard area is currently illuminated by a combination of high-pressure sodium and metal halide lamps, which are generally supported on standards between 40 and 120 feet tall. In general, the entire BNSF San Bernardino Railyard is lit to safely accommodate 24 hour operations seven days a week to a level of 1.0 to 3.0 foot-candles. Specifically, the BNSF San Bernardino Railyard currently utilizes:<sup>64</sup>

- Four Cobra style fixtures with metal halide lamps;
- Thirteen 80 feet high fixed metal poles with a combination of high pressure sodium and metal halide lamps;
- Seven 120 feet high mast metal fixtures with high pressure sodium lamps; and
- Forty 80 feet high wooden fixtures with high pressure sodium bulbs.

ii. BNSF Hobart Railyard

The vicinity around the BNSF Hobart Railyard includes commercial, industrial, and heavy industrial operations (e.g., UP Commerce Railyard, warehousing, and servicing facilities, etc.), and the I-710 freeway (which bisects the BNSF Hobart Railyard) that involve substantial lighting. The lighting standards at the BNSF Hobart Railyard are guided by local planning documents, safety requirements, and industry best management practices. The BNSF Hobart Railyard area is currently illuminated by metal halide and high-pressure sodium light fixtures, most of which are supported on standards between approximately 80 and 100 feet high. In general, the entire BNSF Hobart Railyard is lit to safely accommodate 24 hour operations seven days a week to a level of 1.0 to 3.0 foot-candles. Specifically, the BNSF Hobart Railyard currently utilizes:<sup>65</sup>

- Thirty-four Cobra style fixtures with high pressure sodium lamps;
- Fifty-eight metal high mast poles with high pressure sodium lamps;
- Eight Musco poles with high pressure sodium lamps;
- Twenty-one wooden poles with high pressure sodium lamps; and
- Mounted (without poles) metal halide lamps on the inbound and outbound lanes.

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<sup>64</sup> ARB staff, Harold Holmes, communication with CEA Consulting, March 1, 2011.

<sup>65</sup> ARB staff, Harold Holmes, communication with CEA Consulting, March 1, 2011.

iii. UP Commerce Railyard

The vicinity around the UP Commerce Railyard includes commercial, industrial, and heavy industrial operations (e.g., BNSF Hobart Railyard, warehousing, and servicing facilities, etc.), and the I-710 freeway (which bisects the UP Commerce Railyard) that involve substantial lighting. The lighting standards at the UP Commerce Railyard are guided by local planning documents, safety requirements, and industry best management practices. The UP Commerce Railyard area is currently illuminated by 336 high-pressure sodium light fixtures (lamps), most of which are supported on standards between approximately 80 and 100 feet high. In general, the entire UP Commerce Railyard site is currently lit to safely accommodate 24 hour operations seven days a week to a standard lighting level 1.0 to 3.0 foot-candles. Specifically, the UP Commerce Railyard currently utilizes:<sup>66</sup>

- Twenty-seven wooden poles with Cobra style single lamp street lighting;
- Seventeen wooden poles with one-lamp floodlights;
- Twenty-seven wooden or metal poles with two-lamp floodlights;
- Twenty ring style high mast towers with 12 lamps;
- Four basket style high mast towers with 8 lamps; and
- Eight lattice style high mast towers with 8 lamps.

iv. UP ICTF/Dolores Railyards

The vicinity around the UP ICTF/Dolores Railyards includes industrial and heavy industrial operations (e.g., industrial refining facilities, container and truck parking, and servicing facilities, etc.), and the I-405 highway that involve substantial lighting. The lighting standards at the UP ICTF/Dolores Railyards are guided by local planning documents, safety requirements, and industry best management practices. The UP ICTF/Dolores Railyards area is currently illuminated by approximately 596 high-pressure sodium light fixtures supported on standards between 80 and 100 feet high. The loading areas are currently lit using high mast lighting with six, seven, or eight 1000-watt fixtures, at 300 feet spacing, with 80 feet standards mounted on concrete pedestals. The main entrance, the U.S. Customs area, the train entrance area, the guest automobile parking area, the storage area, and the maintenance and guardhouse area are currently lit using 40 feet lighting standards with single and double luminaries using Cobra-type lighting fixtures, with a mix of 400-watt and 250-watt fixtures, supported by standard street lighting poles and fixtures.

In general, the entire UP ICTF/Dolores Railyards site is currently lit to safely accommodate 24 hour operations seven days a week to a standard lighting level of 1.0 to 3.0 foot-candles. The total site area lighting demand at peak use periods is

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<sup>66</sup> ARB staff, Harold Holmes, communication with CEA Consulting, March 1, 2011.

approximately 530 kilowatts. Specifically, the UP ICTF/Dolores Railyards currently utilize.<sup>67</sup>

- Seventy-four high mast towers with 8 lamps;
- One high mast tower with 4 lamps;
- Sixty-eight wooden poles with street lighting (Cobra style) single lamp;
- Thirty wooden poles with street lighting (Cobra style) back to back (total of 2 lamps);
- Twenty-four wooden poles with floodlights (2 lamps); and
- Seven wooden poles with floodlights (4 lamps).

*b. Impacts Analysis*

During the initial review of the project, staff determined that the potential for the creation on new sources of light or glare is the only potentially significant impact under 'Aesthetics' warranting further analysis.

The Revised 2010 Commitments themselves do not recommend or propose any future changes that would result in changes in lighting or glare. However, the railroads have committed to evaluate possible site operational changes at the railyards in response to requests from the public (see *Project Description* for discussion of operational changes). A railroad may decide to incorporate some feasible site operational changes into its emission reduction plans. Some of these changes could involve changes in locations of particular lights at a railyard (e.g., lighted cranes could be moved due to moving of cargo handling operations to a different part of a railyard).

It is unknown at this time what specific operational changes, if any, will be taken at each railyard. Therefore, ARB cannot provide a more detailed analysis of potential light and glare impacts at the particular railyards. ARB staff does not anticipate that potential changes in operations would lead to changes in light and glare because, as described in the environmental setting above, the railyards are already substantially lighted and any movement of individual lights are not expected to change the existing light and glare from these sights.

Although considered unlikely, it is possible that a railroad could shift operations in a way that affects the lighting and glare at any of the affected yards. The siting of particular lights around the railyard, as part of an operational change, may or may not be subject to further approvals by local land use authorities or further project specific environmental review (see potential mitigation below). In view of the uncertainty about future actions that could affect light and glare, this analysis takes a conservative approach and considers this impact to be potentially significant.

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<sup>67</sup> ARB staff, Harold Holmes, communication with CEA Consulting, March 1, 2011.

c. *Potential Mitigation*

ARB does not have any land-use authority over railyard operations, and therefore, cannot require project-level mitigation that involves railyard operations. ARB's authority over the railyards is limited to the provisions outlined in the Revised 2010 Commitments. ARB could remove the requirements in the Revised 2010 Commitments specifically requested by community members that the railroads evaluate and consider operational changes.

It is not clear to ARB what local permitting authority, if any, may apply to future decisions by the railroads to change lighting at the railyards. It is infeasible, at this time, to determine whether local permitting authority (that could trigger further environmental review and mitigation) would be applicable to potential future lighting changes, and therefore whether any mitigation would be required for such changes. First, any applicable local permitting authority may be preempted by the ICCTA.<sup>68</sup> Furthermore, even if lighting changes were subject to local permitting authority, it is not clear whether a permit would be discretionary or ministerial because the nature and scope of potential lighting changes is too speculative to identify at this time.<sup>69</sup> Therefore, ARB cannot identify feasible mitigation measures to reduce or eliminate identified potentially significant light and glare impacts. Consequently, the FED takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that the potentially significant impacts to aesthetics (light and glare) resulting from potential operational shifts may be unavoidable.

2. Noise

This section includes a description of the environmental setting (e.g., acoustic fundamentals, types of sensitive land uses and sources in the project area) and an evaluation of potential noise (and vibration) impacts associated with implementation of the Revised 2010 Commitments.

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<sup>68</sup> Preemption is factually based. (See *New York Susquehanna & Western Railway Corporation v. Jackson* (3d Cir.2007) 500 F.3d 238, 252-253). To the extent that local agencies have general code provisions establishing standards for light and glare emitted from a facility, they may be considered to be standards of general applicability and not subject to preemption under the ICCTA. (*Association of American Railroads (AAR) v. the South Coast Air Quality Management District* (9<sup>th</sup> Cir. 2010) 622 F.3d 1094, 1098; *New York Susquehanna & Western Railway Corporation v. Jackson, supra*, 500 F.3d at pp. 252-253; *Green Mountain Railroad Corp. v. State of Vermont* (2d Cir. 2005) 404 F.3d 638, 643.) To the extent such local regulations impair the railroads' ability to operate, and to manage their operations, the local rules could be preempted by the ICCTA, even if such rules are generally applied. (*New York Susquehanna & Western Railway Corporation v. Jackson, supra*, 500 F.3d at pp. 252-253.).

<sup>69</sup> Only discretionary permits trigger CEQA review and mitigation requirements. (Public Resources Code, §21080, subds. (a), (b)(1).)

a. *Environmental Setting*

i. Acoustic Fundamentals

A sound level is expressed in the decibel (dB) scale, which is the logarithmic ratio of one sound quantity to a reference sound pressure. For sound pressure in air, the standard reference quantity is generally considered to be 20 micropascals, which directly corresponds to the threshold of human hearing. The use of the decibel is a convenient way to handle the million-fold range of sound pressures to which the human ear is sensitive. A decibel is logarithmic; it does not follow normal algebraic methods and cannot be directly added. For example, a 65 dB source of sound, such as a truck, when joined by another 65 dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB). A sound level increase of 10 dB corresponds to ten times the acoustical energy, and an increase of 20 dB equates to a hundred-fold increase in acoustical energy.

The loudness of sound perceived by the human ear depends primarily on the overall sound pressure level and frequency content of the sound source. The human ear is not equally sensitive to loudness at all frequencies in the audible spectrum.

Noise can be generated by a number of sources, including mobile sources (transportation noise sources) such as automobiles, trucks, and airplanes; and stationary sources (non-transportation noise sources) such as construction sites, machinery, and commercial and industrial operations. As acoustic energy spreads through the atmosphere from the source to the receiver, noise levels attenuate (decrease) depending on ground absorption characteristics, atmospheric conditions, and the presence of physical barriers (walls, building façades, berms). Noise generated from mobile sources generally attenuates at a rate of 4.5 dB per doubling of distance. Stationary noise sources spread with more spherical dispersion patterns, which attenuate at a rate of 6 to 7.5 dB per doubling of distance.

The response of the ear to sound is dependent on the frequency of the sound. The human ear has peak response around 2,500 to 3,000 hertz and has a relatively low response at low frequencies. This has led to the concept of weighting scales. In the "A-weighting" scale, the sound pressure levels for the lower frequency bands and high frequency bands are reduced by certain amounts before they are being combined together to give one single sound pressure level value. This value is designated as dB(A). The dB(A) is often used as it reflects more accurately the frequency response of the human ear. Weighting networks are often incorporated in measuring equipment to give readings in dB(A).<sup>70</sup>

Atmospheric conditions such as wind speed, turbulence, temperature gradients, and humidity may additionally alter the propagation of noise and affect levels at a receiver.

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<sup>70</sup> Environmental Protection Department, Government of the Hong Kong Special Administrative Region, Educational Package on Sound and Noise.

Furthermore, the presence of a large object or objects (e.g., barrier, topographic features, and intervening building façades) between the source and the receptor can provide significant attenuation of noise levels at the receiver. The amount of noise level reduction or “shielding” provided by a barrier primarily depends on the size of the barrier, the location of the barrier in relation to the source and receivers, and the frequency spectra of the noise. Natural barriers such as berms, hills, or dense woods, and human-made features such as buildings and walls, may be used as noise barriers.

ii. Vibration

Vibration is the periodic oscillation of a medium or object with respect to a given reference point. Sources of vibration include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) and those introduced by human activity (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous (e.g., operating factory machinery) or transient in nature (e.g., explosions). Vibration levels can be depicted in terms of amplitude and frequency, relative to displacement, velocity, or acceleration.

iii. Existing Sources of Noise and Vibration

The four high-priority railyards covered by the Revised 2010 Commitments are large, existing industrial-type operations that already run 24 hours a day, seven days a week, with on-site and entering/exiting diesel equipment. The physical scale, frequency of activity, noise, and vibration from these operations are part of the existing conditions.

b. *Regulatory Setting*

The noise at railroads is regulated by U.S. EPA and Federal Railroad Administration (FRA) noise emission regulations, and enforced by the FRA:

- Title 49 Code of Federal Regulations (CFR) Part 229.129 regulates locomotive horn noise to between 96 and 110 dB(A) at 100 feet forward of the locomotive direction of travel. This regulation is a safety requirement for railroads, in that it specifies the minimum horn noise required to warn motorists of trains approaching train crossings, as well as the methods that must be used to determine compliance with this requirement.
- Title 40 CFR Part 201 governs noise from locomotives, railcar operations, retarders, car coupling, and load cell test stands. Railroads are responsible for compliance and defective equipment, and are required to correct any noise defect, remove defective equipment from service and to the nearest facility for repairs, or modify the car coupling procedure to bring it within the federal noise limits. The U.S. EPA noise standards at Title 40 CFR Part 201 are summarized in Table F-12 below:

**Table F-12**  
**Summary of U.S. EPA Noise Standards**  
**(Title 40 CFR Part 201)**

Noise Source	Decibel Level, dB(A)	Measurement Location
<b>Pre-1980 locomotives</b>		
Stationary, Idle	73	30 meters
Stationary, all other throttle settings	93	30 meters
Moving	96	30 meters
<b>Post-1979 locomotives</b>		
Stationary, Idle	70	30 meters
Stationary, all other throttle settings	87	30 meters
Moving	90	30 meters
<b>Switch locomotives (Switchers)</b>		
Stationary, Idle	70	30 meters
Stationary, all other throttle settings	87	30 meters
Moving	90	30 meters
Alternative stationary and moving standard for pre-1980 switchers	65	receiving property, if all switchers at a facility are in compliance with this standard
<b>Railcars</b>		
Moving 45 mph or slower	88	30 meters
Moving faster than 45 mph	93	30 meters
<b>Other railyard equipment</b>		
Retarders	83	receiving property
Car coupling standard	92	receiving property
Alternative car coupling standard	Can exceed 92 decibels if the cars representative of those found to exceed standard are coupled at similar locations at speeds of 8 mph or less	
Load cell tests	78	30 meters
Alternative load cell standard	65	receiving property, if all load cells at a facility are in compliance with this standard
Alternative standard (if the measurement procedures cannot be complied with)	65	receiving property is located more than 120 meters from load cell

*c. Impacts Analysis*

The Revised 2010 Commitments will not lead to changes in how the railroads comply with existing U.S. EPA and FRA noise regulations. ARB anticipates that noise will decrease in response to the Revised 2010 Commitments. ARB staff anticipates that the railroads will need to deploy new and upgraded lower-emitting locomotives in significant numbers to meet the declining emission levels. These lower-emitting locomotives are quieter than the current models. The switch locomotives, which operate primarily in the railyard assembling railcars into trains, are already transitioning to generator-set (gen-set) models. The N-Viro Motive gen-set has noise reduction levels of up to 85 percent or higher, with the resultant noise levels similar to on-highway trucks.<sup>71</sup> When the new advanced technology line haul locomotives are available, staff expects those units to be roughly 10 to 30 percent quieter than the current locomotives that will be replaced. Staff also anticipates the possibility that some of the existing diesel cargo handling equipment at railyards (such as cranes and yard trucks) may be replaced with fully electric models that are noticeably quieter.

If operational changes involving construction (such as electric infrastructure for cranes) are implemented, there could be short-term construction-related noise impacts but the nature and scope of these impacts are unknown at this time. Generally, construction generated noise levels would be intermittent and temporary in nature and similar to the types of noise sources and associated levels that currently exist within these industrial settings.

The Revised 2010 Commitments would not increase the total noise at a railyard on an on-going basis, but may change the location of some existing noise sources within the railyard. As a result of operational changes, noise from a maintenance facility or cargo handling equipment operation could be moved to a different location within a railyard.

Generally, staff does not anticipate that movement of a maintenance facility from one part of the railyard would result in significant adverse noise impacts because noise from this source is a small subset of the overall noise at the railyards. However, it is unknown at this time what specific operational changes, if any, will be taken at each railyard.

Therefore, ARB cannot predict at this time what potential noise impacts could arise from operational changes, including movement of a maintenance facility. As discussed under Aesthetics, operational changes, such as movement of a maintenance yard, may or may not be subject to further environmental review under permitting requirements by local land use agencies. In light of the uncertainty of possible noise impacts arising from operational changes, and because this type of shift may not be subject to further environmental review whereby mitigation could be incorporated, this analysis takes a conservative approach and considers this to be a potentially significant impact.

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<sup>71</sup> National Railway Equipment Company: <http://www.nationalrailway.com/nviro.asp>. Web archive, May 5, 2011.



*d. Potential Mitigation*

ARB does not have any land-use authority over railyard construction and operations, and, therefore, cannot require project-level mitigation that involves railyard operations. ARB's authority over the railyards is limited to the provisions outlined in the Revised 2010 Commitments. ARB could remove the requirements in the Revised 2010 Commitments specifically requested by community members that the railroads evaluate and consider operational changes.

The railroads may or may not be subject to further project-level compliance with applicable permits issued at the local level, which routinely require mitigation to avoid impacts. (See discussion under Aesthetics, Potential Mitigation.) Therefore, ARB cannot identify feasible mitigation measures to reduce or eliminate identified potentially significant noise impacts. Consequently, the FED takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that the potentially significant impacts to noise resulting from potential operational shifts may be unavoidable.

3. Transportation and Traffic

The section includes a description of the environmental setting and potential indirect impacts associated with implementation of the Revised 2010 Commitments with respect to transportation and traffic.

*a. Environmental Setting*

*i. BNSF San Bernardino Railyard*

Trucks usually enter the railyard through the main ingress on West 4<sup>th</sup> Street. Once in the railyard, containers and trailers are parked in the eastern section of the intermodal area, east of Mt. Vermont Avenue.<sup>72</sup> In the data available for the time period between May 1, 2005 and April 30, 2006, BNSF container trucks generated about 1,700 trips a day, equaling about 620,000 trips per year.<sup>73</sup> The freeway route taken by most trucks on exiting the railyard is the I-215.<sup>74</sup> Assuming that the number of truck trips is proportionate to the number of container lifts, the number of truck trips is approximately 500,000 per year in 2010 for the BNSF San Bernardino Railyard.

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<sup>72</sup> ENVIRON International, *San Bernardino TAC Emissions Inventory*, January 2008, p. 2-1.

<sup>73</sup> ENVIRON International, *San Bernardino TAC Emissions Inventory*, January 2008, p. 6-3.

<sup>74</sup> Air Resources Board, *Health Risk Assessment for the BNSF Railway San Bernardino Railyard*, June 2008, p. 19.

ii. BNSF Hobart Railyard

Trucks enter the intermodal area at the ingress at the western end of Sheila Street and then travel to the western end of the railyard, and depart from the northwest corner of the railyard. Street-legal yard trucks, which transport containers between the main railyard and the two satellite areas, were also categorized as on-road container trucks. Yard trucks enter and exit the railyard at a gate near the southwest corner of the railyard and travel along East 26<sup>th</sup> Street to the two satellite areas.

In the data available are for the time period between May 1, 2005 and April 30, 2006, BNSF container trucks generated about 3,530 trips a day, equaling 1,289,000 trips per year. In addition, BNSF on-site contractors operate a fleet of on-road trucks to move empty containers to off-site lots and other facilities. These vehicles make approximately 1,300 trips a day (474,500 trips per year) from the contractor gate separate from the other entrance and exit gate for other container trucks.<sup>75</sup> BNSF Hobart Railyard is supported by the small BNSF Commerce-Eastern domestic container intermodal railyard, which had another approximately 204,000 truck trips in 2005,<sup>76</sup> giving a total of approximately 1,970,000 truck trips for BNSF Hobart Railyard. The freeway route taken by container trucks on exiting the railyard is the I-710.<sup>77</sup> Assuming that the number of truck trips is proportionate to the number of container lifts, the number of truck trips is approximately 1,595,000 per year in 2010 at the BNSF Hobart Railyard.

iii. UP Commerce Railyard

Truck traffic enters the railyard gate complex from East Washington Boulevard. On-road heavy heavy-duty trucks receive containers from or deliver containers to the UP Commerce Railyard.<sup>78</sup> In the data available for the year 2005, UP container trucks generated about 1,025 trips a day (374,000 trips per year).<sup>79</sup> The predominant freeway route taken by trucks on exiting the gate complex is the I-710.<sup>80</sup> Prior to 2005, UP moved the Commerce railyard main truck gate entrance further west from nearby residents living just west of I-710 and Washington Boulevard. Assuming that the number of truck trips is proportionate to the number of container lifts, the number of truck trips for 2010 is estimated at 465,000 for the UP Commerce Railyard.

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<sup>75</sup> Air Resources Board, *Health Risk Assessment for the BNSF Railway Hobart Railyard*, November 2007, pp. 30-34.

<sup>76</sup> ENVIRON International, *Commerce-Eastern Railyard TAC Emission Inventory*, December 2006, pp. 6-2 – 6-4.

<sup>77</sup> Air Resources Board, *Health Risk Assessment for the BNSF Railway Hobart Railyard*, November 2007, p. 45.

<sup>78</sup> Sierra Research, *Toxic Air Contaminant Emissions Inventory and Dispersion Modeling Report for the Commerce Rail Yard, Los Angeles, California*, January 2007, pp. i, 6.

<sup>79</sup> Sierra Research, *Toxic Air Contaminant Emissions Inventory and Dispersion Modeling Report for the Commerce Rail Yard, Los Angeles, California*, January 2007, p. 25.

<sup>80</sup> Air Resources Board, *Health Risk Assessment for the Union Pacific Railroad Commerce Railyard*, November 2007, p. 40.

iv. UP ICTF/Dolores Railyards

Truck traffic enters the railyard gate complex from East Sepulveda Boulevard.<sup>81</sup> Trucks receive containers from or deliver containers to the UP ICTF Railyard. In the data available for the year 2005, UP container trucks generated about 2,575 trips a day (940,000 trips per year).<sup>82</sup> The predominant freeway route taken by trucks on exiting the gate complex is the I-5, although about 23 percent of trucks take the I-405 South to the I-710.<sup>83</sup> Assuming that the number of truck trips is proportionate to the number of container lifts, the number of truck trips is approximately 675,000 per year in 2010 for the UP ICTF/Dolores Railyards.

It should be noted that the UP ICTF Modernization Plan includes a proposal to move the main gate located at Sepulveda west to Alameda Street to reduce the potential for truck idling emissions to affect nearby Long Beach residents. The UP Modernization Plan is currently being reviewed under an Environmental Impact Report (EIR) being prepared by the South Coast Air Quality Management District.<sup>84</sup>

b. *Impacts Analysis*

The Revised 2010 Commitments themselves do not recommend or propose any future changes that would result in any changes in traffic because the project provides a standard for reduced emissions and does not specify any specific methods for meeting that standard. The Revised 2010 Commitments would not increase cargo activity at the railyards, which is instead driven by economic activity and customer decisions. As a result, staff does not expect the railroads to change the number of trucks entering and exiting the yards in response to the Revised 2010 Commitments.

Implementation of the Revised 2010 Commitments could improve the current conditions to the extent that the railroads continue to seek greater operational efficiency to save fuel and to meet the declining emission caps in the Revised 2010 Commitments. One way to implement operational efficiency is to seek changes that reduce idling time and provide for faster flow of traffic into and out of the yards. For example, BNSF installed an automatic truck gate system at BNSF San Bernardino Railyard. The BNSF automated truck gate system provided significant reductions in truck queuing times and reduced truck operational time within the railyard up to 50 percent. It is also possible that the reduced health risk under the Revised 2010 Commitments will help the applicants obtain funding for more grade separation infrastructure projects and

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<sup>81</sup> Sierra Research, *Toxic Air Contaminant Emissions Inventory and Dispersion Modeling Report for the Dolores and ICTF Rail Yards, Long Beach, California*, December 2007, p. 38.

<sup>82</sup> Air Resources Board, *Health Risk Assessment for the UP Intermodal Container Transfer Facility (ICTF) and Dolores Railyards*, April 2008, p. 38.

<sup>83</sup> Sierra Research, *Toxic Air Contaminant Emissions Inventory and Dispersion Modeling Report for the Dolores and ICTF Rail Yards, Long Beach, California*, December 2007, p. APP-114.

<sup>84</sup> Memorandum of Agreement Between the Intermodal Container Facility Joint Powers Authority and the South Coast Air Quality Management District for the Preparation of an Environmental Impact Report Specific to the Modernization of the Intermodal Container Transfer Facility, May 16, 2008.

expedited truck access routes that reduce the train-vehicle interface. Grade separations would improve the level of service for both passenger and freight vehicles on roadways that intersect the tracks.

If operational changes involving construction (like electric infrastructure for cranes) are implemented, there could be short-term construction-related transportation and traffic impacts but the nature and scope of these impacts are unknown at this time. Generally, construction-related traffic impacts would temporary, limited to the period of construction, and would not result in long-term changes in roadway character or significantly increase the number of annual daily trips.

It is unknown at this time whether a railroad may choose to move a truck gate location as an operational change to reduce diesel PM or where at the three railyards such gate movements could occur (applies to all of the railyards except UP Commerce where the truck gate was already moved to lessen the community impacts). Therefore, at this time, ARB cannot provide a more detailed analysis of potential truck route impacts on surface streets associated with possible changes in gate locations. As discussed under Aesthetics, the movement of a truck gate, as part of an operational change at a facility, may or may not be subject to further approvals by local land use authorities or further project specific environmental review. In light of the uncertainty about future actions potentially affecting traffic, this analysis takes a conservative approach and considers this impact to be potentially significant.

*c. Potential Mitigation*

ARB does not have any land-use authority over railyard operations, and therefore, cannot require project-level traffic mitigation that involves railyard operations. ARB's authority over the railyards is limited to the provisions outlined in the Revised 2010 Commitments. ARB could remove the requirements in the Revised 2010 Commitments specifically requested by community members that the railroads evaluate and consider operational changes.

The railroads may or may not be subject to project-level compliance with applicable permits issued at the local level, which routinely require mitigation to avoid impacts which could minimize these impacts to a level of less than significance. (See discussion under Aesthetics, Potential Mitigation.) Therefore, ARB cannot identify feasible mitigation measures to reduce or eliminate identified potentially significant traffic impacts. Consequently, the FED takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that the potentially significant impacts to transportation and traffic resulting from potential operational shifts may be unavoidable.

## **D. Other CEQA Considerations**

In considering the universe of potential impacts that could result from approval and implementation of the Revised 2010 Commitments, ARB staff identified and evaluated one possible impact that does not fit neatly into the established impact categories. ARB staff considered the potential for the railroads to meet the declining emission caps under the Revised 2010 Commitments by shifting activity from one of the four high-priority railyards to other railyards. ARB staff concludes that it would be highly unlikely to occur and, even if it occurred, existing constraints would severely limit the amount of activity that could possibly be shifted.

Staff evaluated the factors that would influence this possibility – the location of alternative railyard(s), feasibility of moving operations based on the type of railyard and cargo and the capacity of any alternative railyard(s) to absorb additional activity. Staff's analysis indicates that this environmental impact is highly unlikely due to physical, operational, and capacity constraints at the other railyards in the region, as described below.

### 1. Background

#### *a. Intermodal Railyards*

In 2005, the four high-priority railyards handled roughly 75 percent of the total containers moved by UP and BNSF at their major off-dock intermodal railyards in California. All four are intermodal railyards, which are railyards whereat cargo arrives and departs via two different transport modes – train or truck. The cargo handled by these yards is typically in international shipping containers (a standard 20 or 40 feet in length) or domestic trailers (a standard 48 or 53 feet in length). Cargo is moved in containers or trailers by a truck for a short distance and transported on a train for longer distances. To transfer containers and trailers between train and truck, an intermodal railyard must have paved surfaces and a substantial distance between tracks to accommodate the needed cranes, yard trucks, and on-road trucks. An intermodal railyard may be configured so that it only handles shipping containers or trailers holding international or domestic cargo, or it may be configured to handle a combination of the two. A railyard that is designed for one type of cargo may not be able to readily accommodate the other.

#### *b. Classification Railyards*

The other primary type of railyard is a classification railyard where all of the cargo comes in by train and leaves by train. Railcars already loaded with containers or trailers are moved around a series of tracks by switch locomotives that disassemble an incoming train and assemble or build a new outgoing train for long distance transport. Classification railyards are distinguished by many rail sidings or segments of track close together where railcars can be moved, temporarily stored, and retrieved. Major

classification railyards typically also support large locomotive refueling and maintenance operations. This type of railyard typically does not have paved areas, truck access, or cranes because switch locomotives do all of the necessary work.

## 2. Ability to Shift Rail Activity

BNSF and UP are competitors. Each uses its own system of railyards, equipment, and track (except for the shared Alameda Corridor that serves the Ports of Los Angeles and Long Beach). Table A-5 in Appendix A of this document shows the container lift activity and capacity at each of the four high-priority yards.

### *a. BNSF*

BNSF San Bernardino and BNSF Hobart (BNSF Commerce-Eastern, a small spillover domestic intermodal railyard one mile east from BNSF Hobart, was closed in 2008-2009) are that railroad's intermodal facilities in Southern California. The nearest alternative BNSF intermodal railyards are located in the Port of Oakland and Stockton, California – both of which are at or near capacity. Therefore, it is not foreseeable that BNSF could or would shift significant levels of container activity from Southern to Northern California in response to the Revised 2010 Commitments.

### *b. UP*

UP's largest intermodal railyards in Southern California are the two high-priority yards, UP Commerce, (which handles a mix of domestic (75 percent) and international cargo (25 percent)) and UP ICTF/Dolores (which is close to the ports and handles nearly all international cargo). UP Commerce has an estimated capacity of 510,000 container lifts and UP ICTF has current estimated capacity of 760,000 container lifts. The other two UP intermodal railyards in Southern California are UP Los Angeles Transportation Center (LATC) and UP Industry, both domestic container facilities, with estimated capacities of 340,000 and 200,000 container lifts.

UP's four off-dock southern California intermodal railyards have a combined container lift capacity of 1.8 million.<sup>85</sup> In 2005, the four UP intermodal railyards combined handled about 1.4 million container lifts.<sup>86</sup> In 2010, this activity level dropped to about 1.3 million container lifts,<sup>87</sup> an overall decline of about seven percent. Based on 2010 figures, UP had about 500,000 container lifts of off-dock railyard capacity remaining in Southern California.

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<sup>85</sup> Los Angeles County Metropolitan Transportation Authority, *Technical Memorandum – I-710 Railroads Goods Movement Study*, WBS Task ID:160.10.50, February 2009, pp. 22-24.

<sup>86</sup> Los Angeles County Metropolitan Transportation Authority, *Technical Memorandum – I-710 Railroads Goods Movement Study*, WBS Task ID:160.10.50, February 2009, p. 18.

<sup>87</sup> United States Securities and Exchange Commission, 2010 Form 10-K, UP Corporation, p. 15.

If the proposed expansion at the UP ICTF facility proceeds, this Modernization Project will double the capacity of that facility, from 760,000 to 1.5 million lifts, and consolidate UP's international cargo operations. Under the Revised 2010 Commitments, UP has agreed to meet the declining emission caps at the combined UP ICTF/Dolores Railyards, including any additional operations resulting from growth or the Modernization Project.

UP LATC Railyard and UP Industry Railyard are primarily domestic intermodal railyards. As of 2010, the combined container lift volume for the two yards was 457,000,<sup>88</sup> leaving an estimated maximum additional lift capacity of about 150,000. The combination of the lift capacity, physical land constraints that restrict expansion, and operational constraints due to the focus of UP LATC and UP Industry Railyards on processing domestic containers, makes it highly unlikely that UP would choose to shift significant levels of lift activity from one of the UP high-priority railyards to these alternative locations in response to the Revised 2010 Commitments.

The closest other large UP international container intermodal facilities in California are UP Oakland, about 400 miles away, and UP Lathrop, south of Stockton. ARB staff considered whether UP could transfer activity from UP Commerce or UP ICTF/Dolores to one of these alternative locations and determined that transfers to the alternative sites were neither reasonable nor feasible. UP Oakland and Lathrop were ruled out because of distance and the limited lift capacity remaining at those two Northern California railyards.

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<sup>88</sup> United States Securities and Exchange Commission, 2010 Form 10-K, UP Corporation, p. 15.

## **V. CUMULATIVE AND GROWTH-INDUCING IMPACTS**

This chapter evaluates the potential for the Revised 2010 Commitments, in combination with other existing and planned projects, to result in cumulatively significant environmental impacts.

### **A. Introduction**

CEQA requires that the cumulative impacts of a proposed project be addressed in an environmental document when the project's incremental effect combined with the effects of other projects is cumulatively considerable. If an environmental effect is not "cumulatively considerable," a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable. Cumulative impacts are impacts on the environment that result from the incremental impacts of a proposed action when added to other past, present and reasonably foreseeable future actions. Such impacts can result from individually minor but collectively significant actions taking place over time.

### **B. Staff Methodology**

The CEQA Guidelines set forth two methods of identifying cumulative impacts related to development projects. One method is based on adopted projections within a given geographic area included in an adopted general plan or certified environmental document. The other method is based on a list of past, present and reasonably foreseeable future projects that could result in cumulative impacts in combination with the proposed project. This discussion is guided by the standards of practicality and reasonableness, and focuses on the cumulative impacts to which the identified other projects contribute.

To determine whether cumulative impacts could occur as a result of the proposed project, staff considered development as identified at build-out conditions in both the general plan EIRs for the cities in which the four railyards are located and recent and projected projects that are in the vicinity of the four railyards, including the Port of Long Beach's proposed and ongoing projects. For the environmental topics checked 'No Impact' on the checklist, the project would not be expected to make any contribution to potential cumulative impacts whatsoever. Therefore, the focus of staff's analysis is only on aesthetics, noise, and transportation and traffic.

**The City of San Bernardino General Plan**<sup>89</sup> EIR was referred to in order to identify development projects located near the BNSF San Bernardino Railyard facility.

**The City of Commerce General Plan**<sup>90</sup> was referred to in order to identify development projects located near the BNSF Hobart and UP Commerce Railyards.

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<sup>89</sup> *Final San Bernardino General Plan Update and Associated Specific Plans: Environmental Impact Report*, September 2005,



**The City of Carson General Plan EIR**<sup>91</sup> was referred to in order to identify development projects located near the Dolores Railyard facility.

**The City of Long Beach General Plan:** The Long Beach 2030 Plan, currently in the works, will be an update to the existing general plan.<sup>92</sup> The noise and transportation elements of the existing general plan were adopted in 1975 and 1991, respectively.<sup>93</sup>

The City of Long Beach General Plan elements for noise (1975) and traffic (1991) are out of date, so ARB staff chose to use more up to date information from the Port of Long Beach documents to evaluate the potential cumulative impacts from implementation of the Revised 2010 Commitments at the UP ICTF facility in Long Beach.

**Port of Long Beach:**<sup>94</sup> The Port of Long Beach makes major capital investments each year, which include environmental infrastructure projects to improve air and water quality, clean soil and underwater sediment, protect wildlife and to create a sustainable Port. Also, the capital projects improve the efficiency of the Port's shipping facilities. Major projects include:

**Gerald Desmond Bridge Replacement:** Replacement or rehabilitation of the existing Gerald Desmond Bridge and adjacent roadway improvements.<sup>95</sup>

**Middle Harbor Redevelopment Project:** Expansion of an existing marine container terminal. The project consolidates two existing container terminals into one 345-acre terminal. Construction includes approximately 54 acres of landfill, dredging, and wharf construction; construction of an on-dock railyard; and reconstruction of terminal operations buildings.<sup>96</sup>

**Pier G modernization:** A multi-year, \$980 million renovation of the ITS container terminal. Construction of a new terminal administration and operations complex, new maintenance and repair facility, and a new on-dock railyard is underway as of early 2011. Shore power facilities and additional dock space are also being added.<sup>97</sup>

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<sup>90</sup> City of Commerce, *2020 General Plan*, January 2008.

<sup>91</sup> City of Carson, *General Plan: Final Environmental Impact Report*, October 2002.

<sup>92</sup> [http://www.lbds.info/planning/advance\\_planning/lb\\_2030/default.asp](http://www.lbds.info/planning/advance_planning/lb_2030/default.asp). Web archive, May 5, 2011.

<sup>93</sup> [http://www.lbds.info/planning/advance\\_planning/general\\_plan.asp](http://www.lbds.info/planning/advance_planning/general_plan.asp). Web archive, May 5, 2011.

<sup>94</sup> <http://www.polb.com/about/projects/default.asp>. Web archive, March 16, 2011.

<sup>95</sup> Port of Long Beach, *Gerald Desmond Bridge Replacement Project: Final Environmental Impact Report / Environmental Assessment & Application Summary Report*, July 2010, p. ES-5.

<sup>96</sup> Port of Long Beach, *Middle Harbor Redevelopment Project Final EIR*, Chapter 1, April 2009.

<sup>97</sup> <http://www.polb.com/about/projects/default.asp>. Web archive, March 16, 2011.

**Long Beach Harbor Dredging:** U.S. Army Corps of Engineers and the Port have commenced a \$40 million dredging project to aid navigation in and around the Port, safely contain contaminated sediments and recycle the dredge material as fill in the Pier G modernization project.<sup>98</sup>

**Pier S Marine Terminal:** Development of a 150-acre container terminal on Pier S and construction of navigational safety improvements to the Back Channel.<sup>99</sup>

**Pier B Rail Yard Expansion:** Expansion of the existing Pier B Rail Yard in two phases, including realignment of the adjacent Pier B Street and utility relocation.<sup>100</sup>

**I-710 Corridor Project:** The Long Beach Freeway (I-710) is a vital transportation artery, linking the Port of Long Beach to the rest of Southern California and beyond. The Los Angeles County Metropolitan Transportation Authority (Metro) is heading a regional effort to study the potential environmental impacts of improvement projects on the corridor.<sup>101</sup> The Port of Long Beach is one of several agencies funding the study.<sup>102</sup>

## C. Analysis

### 1. Aesthetics

The City of San Bernardino General Plan EIR (2005-2025) lists noise, transportation and traffic impacts – not aesthetics – as remaining significant, unavoidable, and adverse at build out after mitigation measures are applied.<sup>103</sup>

The City of Commerce General Plan<sup>104</sup> does not include a discussion of cumulative impacts from existing or ongoing projects. There are two existing projects listed on the City of Commerce website within five miles of the railyards as of April 29, 2011: a Gold's Gym building at 2035 Camfield Avenue and a warehouse development at 6600 Bandini Boulevard, both with an initial study and a mitigated negative declaration.<sup>105,106</sup> The initial studies and mitigated negative declarations found that approval and subsequent implementation of the proposed Gold's Gym building and the proposed warehouse

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<sup>98</sup> City of Long Beach, *Harbor Department Transfer Analysis*, June 2010, p. 20.

<sup>99</sup> <http://www.polb.com/about/projects/default.asp>. Web archive, March 16, 2011.

<sup>100</sup> <http://www.polb.com/about/projects/default.asp>. Web archive, March 16, 2011.

<sup>101</sup> Fact sheet, Los Angeles County Metropolitan Transportation Authority, *I-710 Corridor Project EIR/EIS*.

<sup>102</sup> Los Angeles County Metropolitan Transportation Authority, *I-710 South Corridor Project EIR/EIS Scope, Budget, and Schedule*, Revised - Planning and Project Committee, November 2010, p. 3.

<sup>103</sup> *Final San Bernardino General Plan Update and Associated Specific Plans: Environmental Impact Report*, September 2005, p. 6-1.

<sup>104</sup> City of Commerce, *2020 General Plan*, January 2008.

<sup>105</sup> City of Commerce, *Initial Study and Mitigated Negative Declaration, Gold's Gym Building*, July 2006.

<sup>106</sup> City of Commerce, *Final Initial Study, Xebec Bandini Boulevard Project*, July 2006.

development project will not have either individual or cumulatively considerable impacts, when considering planned and proposed development in the immediate vicinity of either project.<sup>107,108</sup>

Aesthetics is not listed under the cumulatively significant impacts at build out in the General Plan EIR for the City of Carson.<sup>109</sup> The EIR for the Port of Long Beach Gerald Desmond Bridge Replacement, found the project, in conjunction with all related projects planned within the Port, would not contribute to cumulatively considerable significant or adverse impacts on aesthetics.<sup>110</sup>

## 2. Noise

The City of San Bernardino General Plan EIR (2005-2025) identified noise impacts as remaining significant, unavoidable, and adverse at build out after mitigation measures are applied.<sup>111</sup> the identified significant and unavoidable noise impacts are to parklands only and are generated by projected airport noise from the San Bernardino International Airport located within the City of San Bernardino. The EIR found that, until the Airport Master Plan has been adopted by the San Bernardino International Airport Authority and corresponding noise contours have been established, the impact to parkland near the airport could exceed the limitations established by the General Plan and would be considered a significant adverse and unavoidable impact.<sup>112</sup>

ARB staff does not anticipate the incremental effect of potential noise impacts identified at the railyard would contribute to the identified future noise impacts to the parklands generated by the airport because the impacted parklands are not near the BNSF San Bernardino Railyard. The San Bernardino International Airport is on the east side of I-215, 4.5 miles to the east of the BNSF San Bernardino Railyard.

As noted in the discussion for Aesthetics, the City of Commerce General Plan<sup>113</sup> does not include a discussion of cumulative impacts from existing or ongoing projects. The two existing proposed projects within five miles of the railyards both have an initial study and a mitigated negative declaration, which found that approval and subsequent implementation of the two proposed projects will not have either individual or

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<sup>107</sup> City of Commerce, *Initial Study and Mitigated Negative Declaration, Gold's Gym Building*, July 2006, p. 4.

<sup>108</sup> City of Commerce, *Final Initial Study, Xebec Bandini Boulevard Project*, July 2006, p. 4.

<sup>109</sup> City of Carson, *General Plan: Final Environmental Impact Report*, October 2002, p. 2-5.

<sup>110</sup> Port of Long Beach, *Gerald Desmond Bridge Replacement Project: Final Environmental Impact Report / Environmental Assessment & Application Summary Report*, July 2010, p. 2-376.

<sup>111</sup> *Final San Bernardino General Plan Update and Associated Specific Plans: Environmental Impact Report*, September 2005, p. 6-1.

<sup>112</sup> *Final San Bernardino General Plan Update and Associated Specific Plans: Environmental Impact Report*, September 2005, p. 5.10-37.

<sup>113</sup> City of Commerce, *2020 General Plan*, January 2008.

cumulatively considerable impacts when considering planned and proposed development in the immediate vicinity of either project.<sup>114,115</sup>

The General Plan EIR for the City of Carson identified unavoidable significant impacts related to mobile source noise at build out. Although mitigation measures related to mobile source noise would be implemented on a project-by-project basis, it is anticipated that these impacts would remain significant and unavoidable.<sup>116</sup>

### 3. Transportation and Traffic

The City of San Bernardino General Plan EIR identified cumulative impacts on several freeway segments at build out that were considered significant and unavoidable because improvements to the freeway system are the responsibility of the existing regional transportation agencies, not the City of San Bernardino.<sup>117</sup>

Staff does not anticipate that the proposed project's potential for traffic impacts on arterial streets in the vicinity of the railyard (caused by a potential shift in a gate location) would contribute incrementally to cumulative traffic impacts on the freeway system identified in the City of San Bernardino General Plan EIR because a change in a gate location would not affect the volume of truck traffic on the freeways.

As noted in the discussion for Aesthetics, the City of Commerce General Plan<sup>118</sup> does not include a discussion of cumulative impacts from existing or ongoing projects. The two existing proposed projects within five miles of the railyards both have an initial study and a mitigated negative declaration, which found that approval and subsequent implementation of the two proposed projects will not have either individual or cumulatively considerable impacts when considering planned and proposed development in the immediate vicinity of either project.<sup>119,120</sup>

Adverse cumulative impacts to transportation and traffic have been identified for the Port of Long Beach projects, improvements to SR-47, widening of I-710 north of the Ports of Los Angeles and Long Beach (i.e., the I-710 Corridor Project), and the SR-47 connector ramp.<sup>121</sup> The City of Carson General Plan EIR also identified unavoidable significant impacts related to the increase in traffic volumes within the City for the planning horizon year of 2020. The General Plan EIR identified an additional 14

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<sup>116</sup> City of Carson, *General Plan: Final Environmental Impact Report*, October 2002, p. 8-2.

<sup>117</sup> *Final San Bernardino General Plan Update and Associated Specific Plans: Environmental Impact Report*, September 2005, p. 5.14-44.

<sup>118</sup> City of Commerce, *2020 General Plan*, January 2008.

<sup>119</sup> City of Commerce, *Initial Study and Mitigated Negative Declaration, Gold's Gym Building*, July 2006, p. 4.

<sup>120</sup> City of Commerce, *Final Initial Study, Xebec Bandini Boulevard Project*, July 2006, p. 4.

<sup>121</sup> Port of Long Beach, *Gerald Desmond Bridge Replacement Project: Final Environmental Impact Report / Environmental Assessment & Application Summary Report*, July 2010, p. 2-383.

roadway segments operating at unacceptable service levels over existing conditions,<sup>122</sup> three of which are within a mile of the UP ICTF/Dolores Railyards.<sup>123</sup> In addition, development under the General Plan would create unavoidable significant impacts relating to the exceedance of level of service standards established by the congestion management plan at Carson freeway monitoring stations. Although mitigation measures would be implemented on a project-by-project basis, it is anticipated that these impacts may remain significant and unavoidable.<sup>124</sup>

#### 4. Conclusion

##### *a. Aesthetics*

Based on ARB's review of the related projects and projected development in the area of the railyards listed above, staff does not anticipate the incremental effect or impact of the identified potential light impacts at the railyards, when added or combined with adopted projections within the area and other recent and future closely related projects, to be cumulatively considerable, because any potential light changes would occur in an area already dominated by industrial lighting such that any changes would likely be unnoticeable. However, because it is unknown what lighting changes may be undertaken and what development may occur in the area of the railyards that could combine with the railyards' potential light impacts (see Chapter IV, Section C.1.b. *Aesthetics, Impacts Analysis*), this analysis takes a conservative approach and considers the cumulative impact to light to be potentially significant. As explained in Chapter IV, Section C.1.c. (*Aesthetics, Potential Mitigation*) ARB cannot identify feasible mitigation for potential light and glare impacts, so this potential cumulative light impact remains significant and unavoidable.

##### *b. Noise*

Based on ARB's review of the development in the area of the railyards listed above, staff does not anticipate the incremental effect or impact of potential noise impacts of the proposed project, when added or combined with adopted projections within the area and other recent and future closely related projects, to be cumulatively considerable. Any potential noise impacts at the railyards would be the result of a movement of operations from one location to another on the railyard sites, without increasing the existing overall noise levels at the railyards (see Chapter IV, Section C.2.c. *Noise, Impacts Analysis*). The potential for noise impacts from the proposed project, when considered in combination with other plans and projects in the vicinity, is not expected to result in cumulative noise impacts, because the potential impacts from operational

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<sup>122</sup> City of Carson, *General Plan: Final Environmental Impact Report*, October 2002, pp. 4.3-36, 4.3-45.

<sup>123</sup> UP is already considering a gate change at the UP ICTF/Dolores facility now as part of the ICTF Modernization Plan. The UP ICTF Modernization Plan includes a proposal to move the main gate from Sepulveda to Anaheim Street to serve as the truck entrance to the ICTF. The UP ICTF Modernization Plan is currently being reviewed under an Environmental Impact Report being prepared by the South Coast Air Quality Management District.

<sup>124</sup> City of Carson, *General Plan: Final Environmental Impact Report*, October 2002, p. 8-1.

changes would likely be unnoticeable in the industrial environment of the sites within existing noise conditions, and because potential cumulative projects are too remote from the proposed project sites to combine with the project's potential impacts for purposes of cumulative noise impacts.

However, because it is unknown at this time what potential noise impacts may arise from any operational changes that may be undertaken, and it is unknown what development may occur in the vicinity of the railyards that could combine with the railyard's potential noise impacts, this analysis takes a conservative approach and considers the cumulative impact to noise to be potentially significant. As explained in Chapter IV, Section C.2.d. (*Noise, Potential Mitigation*), ARB cannot identify feasible mitigation for potential cumulative noise impacts, so this impact remains significant and unavoidable.

c. *Transportation and Traffic*

Based on ARB's review of the development in the area of the railyards listed above, staff does not anticipate the incremental effect or impact of potential traffic impacts from a shift in operations at the railyards, when added or combined with adopted projections within the area and other recent and foreseeable future closely related projects, to be cumulatively considerable, because potential traffic impacts from a movement in a gate location would be only to arterial streets in the vicinity of the railyards (see Chapter IV, Section C.3.b. *Traffic, Impacts Analysis*). Potential impacts to arterial streets in the vicinity of the railyards are not expected to contribute to identified cumulative impacts on freeway systems because the Revised 2010 Commitments will not change the operational level of the railyards, and therefore will not add new truck trips to the identified impacted freeway segments. However, because it is unknown at this time what development may occur in the vicinity of the railyards that could combine with the railyard's potential traffic impacts to arterial streets, this analysis takes a conservative approach and considers the cumulative impact to traffic on the arterial streets in the vicinity of the four railyards to be potentially significant. As explained in Chapter IV, Section C.3.c. (*Traffic, Potential Mitigation*), ARB cannot identify feasible mitigation for potential cumulative traffic impacts, so this impact remains significant and unavoidable.

## **VI. ALTERNATIVES ANALYSIS**

### **A. Introduction**

#### 1. CEQA Requirements

This chapter provides a discussion of alternatives to the proposed project as required by CEQA. An EIR must describe a range of reasonable alternatives to the proposed project that would feasibly attain most of the project objectives and provide a means for evaluating the comparative merits of each alternative. A "No Project" alternative must also be evaluated. The range of alternatives must be sufficient to permit a reasoned choice, but need not include every conceivable project alternative. CEQA Guidelines §15126.6(a) indicate that there is no ironclad rule governing the nature or scope of the alternatives to be discussed other than the rule of reason. The key issue is whether the selection and discussion of alternatives fosters informed decision making and meaningful public participation.

The regulation that implements the ARB's certified regulatory program does not impose any greater requirements for a discussion of project alternatives in an environmental assessment than is required for an EIR under CEQA.

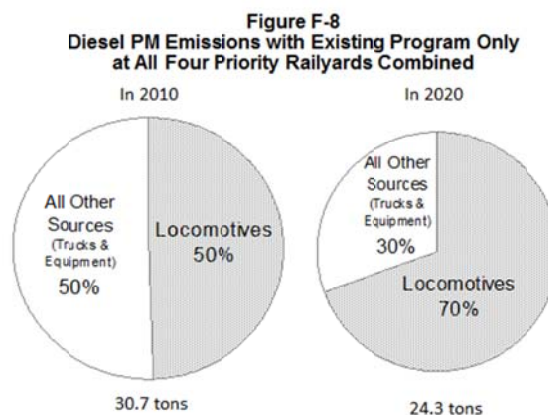
The purpose of the alternatives analysis is to determine whether or not a variation of the proposed project would reduce or eliminate significant project impacts, within the basic framework of the basic project objectives. Alternatives considered in an environmental document should be feasible and should attain basic project objectives. The primary objective of the Revised 2010 Commitments is to further reduce diesel PM emissions at the four identified high-priority railyards beyond the levels expected under the existing program of adopted regulations and agreements, and specifically to achieve at least an 85 percent reduction in diesel PM emissions between 2005 and 2020 regardless of growth in activity or operations.

An agency "need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative." (CEQA Guidelines §15126.6 (f)(3)). The analysis should focus on alternatives that are potentially feasible and that take economic, environmental, social, and technological factors into account, and should focus on reducing or avoiding significant environmental impacts associated with the proposed project. Alternatives that are unreasonable, infeasible, remote, or speculative may be identified, but their potential environmental impacts are not evaluated in this document.

## 2. Context for Regulatory Versus Voluntary Approaches

Much of the discussion of alternatives in this document (both feasible and infeasible alternatives) revolves around the merits of ARB pursuing a regulatory approach versus a voluntary approach that relies on an enforceable agreement negotiated with the railroads. The following facts provide the context for the discussion in this chapter.

- ARB has already effectively regulated all of the diesel PM emission sources at a railyard under its direct authority<sup>125</sup> (e.g., trucks, cargo handling equipment, transportation refrigeration units, locomotive fuels, etc.). As a result, emissions from these sources will continue to decline into the future. The key element of these ARB regulations requires owners of existing diesel vehicles/equipment to reduce diesel PM emissions from those vehicles/equipment by either installing (“retrofitting”) add-on pollution control devices called filters to capture the diesel PM in the engine exhaust or replacing those existing vehicles/equipment on a defined, accelerated schedule with new models that have built-in PM filters. These filters reduce diesel PM emissions by at least 85 percent on day one of operation.
- Locomotives are the largest source of diesel PM emissions at the railyards, contributing roughly half the emissions from the four yards combined in 2010, and growing to more than two-thirds of all the remaining emissions by 2020 as the other sources are increasingly well-controlled. Any effective mechanism to further reduce diesel PM emissions at the four railyards (beyond the existing program of adopted regulations and agreements) must result in significant new reductions from locomotives.



But at the four priority railyards, ARB field surveys indicate that all of the locomotives in routine operation are locomotives that California is specifically preempted from regulating under the federal Clean Air Act. Only the U.S. EPA can regulate the emissions from these locomotives.

- U.S. EPA regulations require that new locomotives and engines achieve 85 percent or better control of PM emissions, starting with new models of locomotives and engines manufactured in 2015. However, these federal regulations do not require railroads to retrofit PM filters on their fleets of existing locomotives or to accelerate the replacement of those locomotives with models achieving the 85 percent PM control. Based on the railroads’ historic rate of locomotive replacement and

<sup>125</sup> ARB’s authority to regulate non-preempted locomotives is discussed in Chapter III, Existing Setting.



remanufacture of the engines, U.S. EPA's rulemaking documents indicate that the entire national fleet will not meet the 85 percent PM control level until after 2035.<sup>126</sup>

- The railroads voluntarily entered into an enforceable 1998 Agreement with ARB that established an emissions performance standard that effectively accelerated the introduction of cleaner switch and interstate line haul locomotives into the fleet operating in the South Coast Air Basin by 2010. The 67 percent reduction in NOx emissions being achieved under this Agreement is based on a performance standard that lets the each railroad chose the specific strategy for cleaner locomotives that best fits its business needs. The railroads also voluntarily entered into an enforceable 2005 Agreement with ARB to reduce locomotive idling, use cleaner fuels in interstate locomotives, allow railyard inspections, and provide emission inventories/health risk assessments for 17 major railyards in the State. These agreements are successfully reducing diesel PM and NOx emissions from UP and BNSF locomotives in California, well beyond the benefits of the applicable federal emission standards for locomotives. The railroads are in full compliance with both agreements.

## **B. Alternatives Considered but Rejected as Infeasible and Not Analyzed**

A CEQA document should identify any alternatives that were considered by the lead agency, but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination (CEQA Guidelines §15126.6(c)). While the scope and goals of proposed projects may be relatively specific, a variety of options can be considered as alternatives to the proposed project.

### 1. Background

Community groups and the South Coast Air Quality Management District (District) have advocated a wide variety of approaches that they believe ARB should pursue, including an extensive list of recommendations submitted on April 24, 2008. ARB responded to that list by preparing a detailed 300 plus-page technical evaluation of the feasibility of 37 options, focusing on ARB's legal authority to implement the respective options, the ability of each option to reduce diesel PM emissions, and the related cost-effectiveness of each option.<sup>127</sup> Staff drew from that technical evaluation in the summary below of the alternatives considered but rejected as infeasible and not analyzed for their potential environmental impacts in this document.

These alternatives have been eliminated from further detailed consideration in this document for the following reasons: 1) they fail to meet most of the basic project objectives, 2) they are infeasible as defined by CEQA (CEQA Guidelines §15364), or 3) they are unable to avoid significant impacts (CEQA Guidelines §15126.6(c)).

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<sup>126</sup> U.S. EPA Fact Sheet, *Emission Factors for Locomotives*, April 2009, p. 8.

<sup>127</sup> *Technical Options Document*, August 2009.

## 2. ARB Regulation for Preempted Locomotives

Stakeholders have urged ARB to adopt a statewide regulation for all locomotives (preempted and non-preempted) that requires the railroads to install diesel PM filters in the near-term, and accelerate the introduction of locomotives meeting U.S. EPA's most stringent Tier 4 emission standards to achieve a 100 percent Tier 4 fleet in California by 2020. As discussed extensively in Appendix A of the *Recommendations Document*, the federal CAA preempts ARB from regulating emissions from the vast majority of the locomotives operating in California. While regulation is infeasible, UP and BNSF have agreed to meet and confer with ARB in 2013 regarding the progress being made by locomotive manufacturers to produce Tier 4 interstate line haul locomotives and the potential for interstate testing of prototype locomotives to include California.

Alternative B presented later in this chapter discusses the potential benefits and impacts of an ARB regulation limited to the older, non-preempted locomotives within the agency's authority.

## 3. ARB Regulation to Limit Locomotive Idling or Control Locomotive Maintenance Idling Emissions

### *a. Locomotive Idling Limits*

Stakeholders have proposed that ARB adopt a statewide version of the South Coast Air Quality Management District's (District) Rules 3501-3503 that sought to establish idling limits for locomotives, plus recordkeeping and air quality modeling requirements for railroads. Adopting an ARB regulation based on the District's rules would not achieve the primary project objective to further reduce emissions beyond the existing program of adopted regulations and agreements because the railroads are already implementing the requirements contained in the 2005 ARB/Railroad Agreement for all 18 major railyards that accomplish the same purpose.

From June 2005 to 2008, UP and BNSF fully implemented the key provisions of the 2005 Agreement to retrofit 99 percent or greater of California intrastate locomotives with idle reduction devices and to program the idle reduction devices to limit non-essential idling to 15 minutes. Non-essential idling excludes idling that occurs in "blue flag" maintenance areas, or is necessary to maintain locomotive engine temperature, battery voltage, air brake pressure, and other necessary operations. The current impact of the 2005 Agreement requirements for idle reduction devices, and the widespread installation of those devices, is to limit non-essential idling to 15 minutes, consistent with the District rule.

*b. Control of Locomotive Idling During Maintenance Operations*

Stakeholders have also proposed that ARB adopt a regulation that would require the capture and control of locomotive emissions while idling during maintenance. The intent would be to require UP to install a prototype technology (known as a “hood” or “bonnet” stationary collection system) at the UP Commerce facility, which has significant locomotive maintenance operations and emissions.

Locomotive maintenance facility idling emissions are primarily the result of technicians trouble-shooting repairs and performing federally required maintenance on locomotives. Technicians need to have the locomotives run through all of the engine power settings to ensure that the diagnostics, repairs, and maintenance were successful. Locomotive maintenance is critical to ensure the reliability, durability, and safety of locomotives while operating in railyards and on the main-lines. Maintenance idling emissions are considered “essential-idling” as they are part of federally required maintenance operations. Under federal law, these maintenance activities are performed inside what are referred to as designated “blue flag” areas. Federal law dictates that the maintenance be performed under a prescribed regulatory schedule. The maintenance is required for railroads to be able to conduct their operations.

ARB staff evaluated the technical feasibility and cost-effectiveness of advanced locomotive emission control systems (ALECS), also known as a hood or bonnet, for stationary locomotives operating within railyards. Based on limited prototype testing performed at the UP Roseville Railyard, this approach was determined to be technically feasible for stationary locomotives. ALECS has not been subject to full-scale railyard demonstration testing. Full-scale railyard demonstration testing is needed to determine the potential utilization rates and emissions reductions within actual railyard operations. Another reason for the demonstration testing is to determine what effects, if any, the ALECS system would have on the timeliness and effectiveness of railyard operations (i.e., moving locomotives in and out of the railyard). A full-scale demonstration is also needed to assess ALECS multiple bonnet system options to determine which can best be utilized between the locomotives and the stationary control equipment. At the present time, a full-scale demonstration project is contemplated for the UP Roseville Railyard, but has not been scheduled.<sup>128</sup>

At this point, this type of technology needs to be subject to a comprehensive field demonstration under actual and continuous railyard operations. ARB staff indicated that the stationary collection system could potentially be cost-effective in future years, but at this time there were a number of more cost-effective strategies (e.g., diesel particulate filters on locomotives) to reduce locomotive emissions and associated public health risks.<sup>129</sup>

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<sup>128</sup> *Technical Options Document*, August 2009, p. 106.

<sup>129</sup> *Technical Options Document*, August 2009, p. 108.

ARB staff found this approach to be infeasible under CEQA because this technology is not currently available or proven for actual railyard operations. Current analyses have not demonstrated that the technology is cost-effective and implementation could impact railroad operations, potentially triggering a conflict with the ICCTA. However, the Revised 2010 Commitments would require UP to specifically evaluate the potential benefits and issues with use of the hood technology at the UP Commerce Railyard and the UP ICTF/Dolores Railyards. UP could elect to purchase and install this technology to help meet the emissions performance standard under the Revised 2010 Commitments.

#### 4. ARB Actions to Determine Compliance with U.S. EPA Locomotive Emission Standards

Stakeholders have proposed two approaches – a California locomotive in-use testing program and a remote sensing program – for ARB to determine whether locomotives are complying with the applicable U.S. EPA emission standards. Under both proposed approaches, if ARB identified a locomotive that exceeded the federal emission standards, it would be up to U.S. EPA to take any enforcement action. Both of the suggested approaches for ARB action are infeasible for different reasons. Neither would attain the primary project objectives because there is no assurance of emission reductions beyond the existing federal regulations and no protection against rising emissions that could result from growth in cargo or railyard activity.

##### *a. California Testing of Existing (“In-Use”) Locomotives*

California and other states are preempted from requiring in-use testing of locomotives under U.S. EPA regulation at 40 CFR, Part 85, §85.1603(a)(2). Even if ARB could require the railroads to pull locomotives out of service to undergo emissions testing to determine compliance with U.S. EPA locomotive emission standards, it would be cost prohibitive to set up a separate program in California that would essentially duplicate the existing U.S. EPA program and achieve very little potential benefit based on the high rate of compliance determined by U.S. EPA under its own testing program.

U.S. EPA prescribes a percentage of in-use locomotives that are tested annually by independent emission testing facilities. Since the inception of the program in 2005, no locomotives that have been tested to date have exceeded the U.S. EPA emission standards. The U.S. EPA locomotive emission standards are required to “not be exceeded” during the locomotive’s useful life. To avoid non-compliance and a possible national locomotive fleet recall, locomotive manufacturers build locomotives with a significant compliance margin below emission standards.

This approach is infeasible for ARB based on cost and would not achieve the basic project objective.

*b. California Remote Sensing Program*

Remote sensing technology has the potential to measure locomotive emissions during normal operations as a locomotive passes a fixed point. However, the results of a pilot program required by State legislation showed that locomotive remote sensing technologies cannot accurately and repeatedly determine whether a locomotive is above or below the applicable federal emission standards.<sup>130</sup>

This approach is infeasible because the technology cannot perform reliably and the approach would not meet the basic project objective for the reasons described above.

5. Voluntary Commitments with Prescriptive Requirements

Stakeholders have suggested that if ARB pursues the voluntary commitment approach, the commitments should prescribe a list of specific actions that the railroads will take to: upgrade the locomotive fleet to the cleanest Tier 4 standards, electrify cargo handling equipment at the railyards, install a hood or bonnet system to capture and control locomotive maintenance idling emissions at UP Commerce, and implement identified other actions to reduce or mitigate the impacts of existing railroad operations on neighboring residents.

A partial list of the other actions suggested by stakeholders includes:

- Install walls that can reduce noise pollution and enforce noise regulations.
- Plant trees and install walls between the railyard and the community to serve as air pollution buffers.
- Weatherize and retrofit homes to prevent air pollution from entering.
- Install air conditioning units with filters in structures like homes and school day care centers.
- Install dual pane and tinted windows to protect from light and noise pollution.
- Fund a health clinic in the community.
- Fund a medical mapping study of the community.
- Fund community recreation centers.
- Move emissions sources (like truck gates and maintenance facilities) to another location within the railyard that is further away from nearby residents.
- Install ambient monitors to measure individual railyard diesel PM emissions.

Currently, there is no approved specific measurement technique to directly monitor or measure site-specific and source-specific diesel PM emissions. Under the Revised 2010 Commitments, ARB will work with the South Coast Air Quality Management District to install and operate two new ambient air quality monitors in the community near the BNSF San Bernardino Railyard and in the community near the BNSF Hobart

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<sup>130</sup> Air Resources Board, *Feasibility of Using Remote Sensing Devices to Measure Locomotive Emissions: Report to the California Legislature*, December 2010.

and UP Commerce Railyards. Other than this air quality monitoring, the other actions are not within ARB's authority to require or within ARB's budget to fund. In addition, the railroads have repeatedly stated that they will not participate in an agreement that directs or potentially constrains how they may conduct their operations. They also will not participate in a prescriptive agreement that defines exactly how they must reduce diesel PM emissions. Since there is no project without the voluntary participation of the railroads, this approach is infeasible.

However, for informational purposes, ARB staff provides the following description of activities underway to address some of the actions proposed by stakeholders.

*Tree planting. In 2010, BNSF provided a grant to the City of San Bernardino for \$250,000. The grant will be used to construct a median and to plant landscaping with trees along Fourth Street next to the BNSF San Bernardino Railyard. The Fourth Street improvements will occur along the northwestern boundary of the BNSF San Bernardino Railyard – west of the bridge and continuing west of the truck gate.*

*Air filters in schools. The Center for Community Action and Environmental Justice was recently awarded a \$1 million grant, through a Unocal settlement fund to install air filtration systems at seven schools located near the BNSF San Bernardino Railyard and the Union Pacific Mira Loma Railyard.*

*Railyard emissions. In a project agreement between British Petroleum and the University of California Los Angeles, a two-year study of railyard emissions was funded through a settlement agreement administered by the South Coast Air Quality Management District beginning in Summer 2009. The project collects filter and vapor samples in communities (i.e., Commerce, San Bernardino, Long Beach) near the four high-priority railyards. The sampling sites are selected with input from members of the nearby communities.*

*Health effects associated with BNSF San Bernardino Railyard emissions. Loma Linda University has been awarded funds of about \$860,000 from the South Coast Air Quality Management District to study the health effects on residents living near the BNSF San Bernardino Railyard. Community members trained in health research practices, in collaboration with researchers, will collect primary data through household- and school-based surveys on the prevalence of cardiovascular disease, respiratory disease, respiratory symptoms, and biologic outcomes, including lung function and airway inflammation. Researchers will also analyze secondary data from the California Cancer Registry to determine whether there is an excess of new and fatal cancers observed from 1999–2008 that could be attributed to diesel smoke and other airborne emissions. As part of the study, Loma Linda also will provide medical treatment to residents affected by the emissions.*

## 6. Voluntary Commitments with Performance Targets for All 18 Major Railyards

Stakeholders have also suggested that if ARB pursues the voluntary commitment approach with its performance target of 85 percent emission reduction by 2020, any commitments should apply to all 18 major railyards covered by ARB's prior health risk assessments. To the extent that implementing the Revised 2010 Commitments at the four high-priority railyards has the potential to result in adverse impacts on aesthetics, noise, and traffic, extending the Commitments to 18 railyards could potentially extend the geographic scope of those impacts.

UP and BNSF have indicated they are willing and able to allocate the necessary resources on upgrades to achieve an 85 percent reduction in diesel PM emissions at the four high-priority railyards, with the understanding that there will be spillover benefits at other railyards from the cleaner locomotives introduced to meet the emission reduction targets at the four high-priority railyards. The railroads noted that implementing a project similar to the Revised 2010 Commitments at all of the 18 major UP and BNSF railyards would exceed the railroads' available capital and staff resources, and they would not be able to implement such a comprehensive project between 2010 and 2020.

Since there is no project without the voluntary participation of the railroads, this approach is infeasible.

### **C. Alternative A: No Project**

CEQA requires a specific alternative of "No Project" to be evaluated. The No Project alternative can help define a future scenario that serves as a point of comparison for cumulative impact contributions of a project. CEQA documents typically assume that the adoption of a "no project" alternative would result in no further action by the project proponent or lead agency.

A "No Project" alternative, in this case, would be for ARB and UP and BNSF to not sign and implement the 2010 Railyard Commitments. The No Project alternative would mean the continued implementation of existing U.S. EPA and ARB regulations and agreements from 2005 to 2020. As shown in Tables F-3 through F-6 in Chapter IV, ARB staff estimates that UP and BNSF will reduce diesel PM emissions at the four priority railyards under the existing program by 50-75 percent by 2020, compared to 2005 levels. The level of control could be less if growth in cargo activity is high. In contrast, the Revised 2010 Commitments would require UP and BNSF to reduce diesel PM emissions at the four high-priority railyards 85 percent by 2020, compared to 2005 levels, regardless of the growth in cargo activity.

The No Project alternative, while not inducing operational shifts that could lead to identified impacts, will not get the benefits of the reduction in health risks and is

therefore not the preferred alternative. This alternative does not even partially satisfy the project objective. The No Project alternative would prolong higher diesel PM emissions and associated health risks for residents living near the four high-priority railyards.

#### **D. Other Project Alternatives Analyzed**

ARB staff evaluated the benefits and impacts of three regulatory alternatives that could (individually and cumulatively) achieve a portion of the project objective to reduce railyard diesel PM emissions and that ARB has the legal authority to implement.

- Alternative B: ARB regulation for non-preempted freight locomotives.
- Alternative C: ARB regulation requiring zero-emission cargo handling equipment operating at intermodal railyards.
- Alternative D: ARB regulation requiring railroads to prepare risk reduction audits, plans, and measures.

In the following pages, ARB staff discusses each of these alternatives including an evaluation of the feasibility, the potential beneficial and adverse environmental impacts, and the staff's conclusion as to whether the alternative can satisfy the project objective with fewer adverse environmental impacts.

##### 1. Alternative B: ARB Regulation for Non-Preempted Locomotives

###### *a. Description of Project Alternative*

Under this alternative, ARB would adopt a statewide regulation requiring at least the major Class I railroads (BNSF and UP) to replace, retrofit, or upgrade any non-preempted locomotives operating in California to achieve more stringent California emission standards. For the regulation to take effect, ARB would need to obtain authorization from U.S. EPA to enforce the regulation under CAA §209(e)(2).

Those locomotives and locomotive engines that are not preempted include those that were manufactured prior to 1973 and have not been upgraded (remanufactured) after 2000, and all locomotives that have exceeded 133 percent of their useful life since original manufacture or remanufacture, whichever is later.



*b. Evaluation of Feasibility*

In this chapter, ARB staff has framed the evaluation with a series of questions and answers to discuss the basis for the conclusions.

*i. What locomotives could potentially be regulated by ARB?*

A detailed discussion of ARB's authority to regulate locomotives is set forth in Appendix A of the *Recommendations Document* and summarized in Chapter III. Although the Health and Safety Code vests ARB with authority to regulate locomotives,<sup>131</sup> that authority is circumscribed by constraints imposed by the preemptions of State regulation under the CAA and the ICCTA. CAA section 209(e)(1) preempts all states, including California, from adopting emission standards and other requirements related to the control of emissions from new locomotives. For purposes of preemption, U.S. EPA has interpreted new as it applies to locomotives to mean original manufacture and subsequent remanufacture of the locomotive<sup>132</sup> and that preemption applies for 133 percent of the new locomotive's useful life.<sup>133</sup> U.S. EPA also determined that a locomotive or locomotive engine owned by a Class I railroad would not be considered either new or preempted if it was manufactured prior to January 1, 1973 and has not been upgraded (remanufactured) to Tier 0 or higher emissions standards after January 1, 2000.<sup>134</sup>

To the extent that ARB has authority under the CAA to adopt emission standards for locomotives manufactured prior to 1973 and non-new locomotives that have exceeded 133 percent of their useful lives, and, once adopted, has received authorization from U.S. EPA under section 209(e)(2) to enforce the regulation, the regulation must be harmonized with the purposes and intent of the ICCTA preemption.<sup>135</sup>

Currently, the U.S. EPA useful life definition would generally exclude states from regulating all newer 2000 to 2011 model year locomotives because these locomotives would not typically have exceeded their useful lives by 133 percent. All of these newer locomotives were built to meet the new U.S. EPA locomotive Tier 0, Tier 1, and Tier 2 emission standards. Table F-2 in Chapter III shows the model years and emission standards for each tier of U.S. EPA locomotive emission standards.

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<sup>131</sup> Health and Safety Code §39666 and 43013(b).

<sup>132</sup> Title 40 Code of Federal Regulation (CFR) §92.2.

<sup>133</sup> Title 40 CFR §1074.12(b).

<sup>134</sup> Title 40 CFR § 92.1.

<sup>135</sup> *AAR v. SCAQMD*, *supra*, 622 F.3d 1094, 1098. Although the Court said the federally-approved regulation must be harmonized with the ICCTA preemption, it did not give any guidance on how this should be done. Based on other court and Surface Transportation Board decisions, application of the ICCTA preemption is a factually-based question. See, e.g., *Jackson*, *supra*, 500 F.3d 238, 253; *Bos. & Me. Corp.*, 2001 WL 458685, at \*6. Thus, ARB believes that harmonization would likely entail some form of balancing the health and welfare benefits derived from regulating locomotives not preempted under the CAA against the potential burdens imposed by the regulation on the railroads' ability to manage and govern rail transportation.

ARB's regulatory authority under the CAA, once harmonized with the ICCTA preemption, would likely only apply to a limited number of switch and medium horsepower locomotives that operate within the four high-priority railyards or the South Coast Air Basin. For practical purposes, because of the decades typically required for these locomotives to reach the 133 percent of their useful life benchmark, a switch or medium horsepower locomotive that is not preempted by the CAA or ICCTA is likely to be a pre-Tier 0 locomotive. Line haul locomotives used to move freight between states would arguably be excluded from ARB's authority because of ICCTA considerations.

- ii. How many non-preempted switch and medium horsepower locomotives could be captured by an ARB regulation?

Based on an April 2011 submittal to ARB and ARB staff's independent field surveys, UP and BNSF operated on a regular basis approximately 80 arguably non-preempted and pre-Tier 0 locomotives in California in 2010 (45 switch and 35 medium horsepower). Recent ARB field surveys indicate that these arguably non-preempted locomotives are not operating at any of the four high-priority railyards on a regular basis. About 20 of the non-preempted locomotives (5 switch and 15 medium horsepower) are operating on a regular basis within the South Coast Air Basin at other railyards, and an additional 60 (40 switch and 20 medium horsepower) are operating in the rest of the State.

Between 2007 and April 2011, UP and BNSF replaced or signed grant contracts to replace nearly all of the older switch locomotives that have operated on a regular basis in the four high-priority railyards with advanced technology locomotives.

UP operates 71 of these advanced technology units in the South Coast Air Basin. UP Commerce and UP ICTF/Dolores Railyards have been fully supported by the advanced technology units since 2008. UP has about 20 arguably non-preempted switch and medium horsepower locomotives currently remaining and operating on a regular basis within the South Coast Air Basin.

In 2010, BNSF procured 11 advanced technology switch locomotives, with another 12 to be purchased in the next few years under incentive contracts. At that point, BNSF will be able to fully support both BNSF San Bernardino and BNSF Hobart Railyards with nearly all advanced technology units. By 2009, BNSF had replaced all of its older, arguably non-preempted switch and medium horsepower locomotives in the South Coast Air Basin with models remanufactured to U.S. EPA Tier 0 emission standards, restarting their useful lives for the purpose of determining preemption under the CAA. As a result, BNSF currently has no non-preempted switch or medium horsepower locomotives operating within the South Coast Air Basin on a regular basis.

- iii. Would all of the arguably non-preempted switch and medium horsepower locomotives have to be upgraded under an ARB regulation?

Not necessarily. Railroads could remove locomotives from the scope of the regulation by (1) converting an arguably non-preempted locomotive to a preempted locomotive by remanufacturing it to meet the minimum U.S. EPA Tier 0+ emission standard or (2) removing the older locomotive from California service and replacing it with a preempted locomotive (i.e., Tier 0 or Tier 0+) from another state.

Railroads also may contest the presumption that California has clear authority to regulate what it has determined to be non-preempted locomotives. The railroads have indicated that there are no non-preempted locomotives that operate solely within California. Rather, the railroads indicate that older switch and medium horsepower locomotives that are not preempted under the CAA move regularly between regions and states, as part of a dynamic western region pool of locomotives and arguably are preempted under the ICCTA. UP and BNSF's western region primarily includes the States of California, Arizona, New Mexico, Nevada, and Oregon. As a result, the railroads could challenge a State non-preempted locomotive regulation as being preempted under ICCTA, as the railroads may argue that an ARB non-preempted locomotive regulation adversely impacts interstate commerce and unreasonably burdens management and governance of rail transportation. Litigation could delay any benefits of the regulation.

- iv. What are the potential emission reductions from an ARB regulation for arguably non-preempted switch and medium horsepower locomotives?

There is a range of potential emission reductions that could result from ARB adoption and implementation of such a regulation for BNSF and UP operated locomotives. On the low end, the diesel PM benefits could be zero if BNSF and UP chose to replace all of the 80 remaining pre-Tier 0 locomotives in California with federally preempted Tier 0 locomotives from other states, because there is no change in PM emission levels between those standards. If BNSF and UP remanufactured the entire California fleet of 80 pre-Tier 0 switch and medium horsepower locomotives that existed in 2010 to comply with an ARB regulation, the remanufacture would have to meet U.S. EPA Tier 0+ standards under federal law. Thus, as shown in Table F-13, the resulting benefits could be 0-16 tons of PM reductions per year statewide, with the certainty that virtually no benefits would be realized at the four high-priority railyards. For perspective, ARB estimates that all BNSF and UP locomotives statewide emitted about 1,400 tons per year of PM in 2010.

**Table F-13**  
**ARB Non-Preempted Locomotive Regulation**  
**Estimated Diesel PM Emission Reductions from Upgrading BNSF and UP**  
**Pre-Tier 0 Switch and Medium Horsepower Locomotives to Either Tier 0 or Tier 0+**  
**(tons per year)**

Areas of California	Number of Non-Preempted Locomotives* in 2010	PM Reductions with Tier 0**	PM Reductions with Tier 0+**
South Coast Air Basin	20	0	4
Rest of State	60	0	12
Total Statewide	80	0	16

\* Number of UP and BNSF non-preempted locomotives that operate within the South Coast Air Basin or the rest of the State on a regular basis, based on UP and BNSF intrastate locomotive inventories for calendar year 2010, submitted in April 2011, and cross-referenced with UP and BNSF 1998 Locomotive NOx Fleet Average Agreement data for the South Coast Air Basin in calendar year 2010.

\*\* Based on annual diesel fuel consumption of 25,000 gallons and U.S. EPA switch duty cycle.

- v. Would the current line haul locomotive fleet achieve additional emission reductions at the four priority railyards beyond the federal program by 2020 if ARB could regulate the non-preempted locomotives that exceeded their useful lives?

Likely not, because very few line haul locomotives currently operating in Southern California would be non-preempted and subject to the ARB regulation. ARB staff recognizes that such a regulation could reduce diesel PM emissions in other areas of the State (as shown on Table F-13) if the railroads chose to comply by upgrading the affected locomotives to Tier 0+ standards. ARB pursuit of such a regulation *in addition to* the Revised 2010 Commitments could sacrifice the much greater existing and planned reductions at the four priority railyards and other railyards in the South Coast Air Basin. The Revised 2010 Commitments recognize the railroads' right to withdraw from their obligations under the agreement, including their obligation to maintain emission reductions already achieved at the four priority railyards, if ARB pursues a regulatory approach, absent the railroads first having failed to comply with the terms of the Revised 2010 Commitments.

In response to the 1998 ARB/Railroad Agreement, BNSF and UP operate locomotive fleets in the South Coast that currently achieve Tier 2 average emission levels, up to twenty years ahead of the rest of the country. Tier 2 interstate line haul locomotives built between 2005 and 2011 would, in most cases, not exceed 133 percent of their

useful lives any earlier than 2013. In 2013, U.S. EPA requires the Tier 2+ remanufacturing kits for Tier 2 locomotives that are ready for remanufacture. The UP and BNSF Tier 2 interstate line haul locomotives are expensive (at about \$2 million or more per unit), are higher horsepower and more fuel efficient units, and pull most of the railroads' revenue commodities. As a result, it is likely UP and BNSF would invest the necessary funding (up to \$200,000 or more per unit) to remanufacture them to meet the required U.S. EPA Tier 2+ PM standards beginning in 2013.

A Tier 2+ locomotive remanufacturing could extend the federal preemption of Tier 2 locomotives for at least an additional seven to ten years. As a result, Tier 2 interstate line haul locomotives may not be eligible for an ARB non-preempted locomotive State regulation until sometime between 2020 and 2030.

*c. Potential Impacts*

*i. Impact on Aesthetics*

The four high-priority railyards are in continuous operation under well-lighted conditions, 24 hours a day, seven days a week. Under existing conditions, there is already substantial nighttime light and glare from fixed lighting sources. A regulation for non-preempted switch and medium horsepower locomotives would result in deployment of new or upgraded lower-emitting locomotives, which should have no impact on light and glare at any of the four high-priority railyards.

*ii. Impact on Noise*

The four high-priority railyards covered by the Commitments are large, existing industrial-type operations that already operate 24 hours a day, seven days a week, with on-site and entering/exiting diesel equipment. The physical scale, frequency of activity, noise, and vibration from these operations are part of the existing conditions.

A regulation for non-preempted switch and medium horsepower locomotives would result in deployment of new or upgraded lower-emitting locomotives. These lower-emitting locomotives are quieter than the current models. When the new advanced technology line haul locomotives are available, staff expects those units to be roughly 10 to 30 percent quieter than the current locomotives that will be replaced. Therefore, the noise reduction resulting from Alternative B would be a positive impact. However, in field surveys in June, July, August, and September 2010, ARB staff found no non-preempted locomotives owned by BNSF or UP in operation at any of the four high-priority railyards on a regular basis. Therefore, little or no overall railyard noise reductions would be likely to occur at any of the four high-priority railyards by remanufacturing the non-preempted switch and medium horsepower locomotives.

iii. Impact on Transportation and Traffic

Trucks enter and exit the four high-priority railyards, either through a gate complex in one area of the railyard or through entrance and exit gates in separate areas of the railyard. At each railyard, the container trucks take a freeway route on exiting. A regulation for non-preempted switch and medium horsepower locomotives could result in deployment of new or upgraded lower-emitting locomotives, which would have no impact on transportation, or on traffic, or on movement of drayage trucks.

d. *Conclusion*

A regulation for non-preempted switch and medium horsepower locomotives would not be expected to generate any adverse impacts on aesthetics or on transportation and traffic. New or upgraded locomotives are quieter than the current models, so the noise reduction resulting from Alternative B could generate a positive impact. However, since ARB staff field surveys in June through September 2010 found no non-preempted locomotives owned by BNSF or UP in operation at any of the four high-priority railyards on a regular basis, little or no noise reductions would be likely to occur at any of the four high-priority railyards by remanufacturing the non-preempted switch and medium horsepower locomotives.

A regulation to implement this alternative, consistent with State and federal law, would, however, not satisfy the project objectives because it would not reduce diesel PM emissions at the four high-priority railyards beyond the existing program. The statewide reductions in diesel PM would be 0-16 tons per year statewide, with no reductions realized at the four high-priority railyards. Under the Revised 2010 Commitments, 12.5 tons per year of additional diesel PM reductions would be achievable at the four high-priority railyards alone. Similarly, the Revised 2010 Commitments may result in spillover emission reductions benefits to the rest of the State, through the accelerated introduction of Tier 4 interstate line haul locomotives into California, that would equal or exceed the potential diesel PM emissions reductions statewide of an ARB non-preempted locomotive regulation.

2. Alternative C: ARB Regulation for Zero-Emission Cargo Handling Equipment

a. *Description of Project Alternative*

Under this alternative, ARB could consider amending the existing statewide regulation for cargo handling equipment operating at ports and intermodal railyards to require certain equipment at intermodal railyards to meet zero-emission levels on site, essentially through electrification of certain operations.

Under such a proposal, the regulation could be amended to require the replacement of nearly all of the existing diesel cargo equipment that moves containers, including

existing diesel rubber tired gantry cranes (RTGs), diesel yard tractors and forklifts/picks with electrified rail mounted gantry (RMG) cranes and the installation of the necessary RMG electric infrastructure at covered railyards. While existing diesel RTGs, yard tractors, and forklifts/picks are capable of operating anywhere in the railyard to move containers, an electric RMG is a very large overhead crane mounted on fixed guides that transfers a container between the railcar and the truck trailer and is fully capable of performing the functions of the more mobile diesel cargo handling equipment. These RMGs are installed in single, fixed location between the rail tracks and the container storage area.

Alternatively, a proposed regulation could more limitedly require replacement of diesel yard tractors with fully electric yard trucks as part of the existing yard operations.

*b. Evaluation of Feasibility*

ARB has the authority under State and federal law to adopt regulations to reduce emissions from mobile cargo handling equipment,<sup>136</sup> as evidenced by the existing ARB regulation for these sources. In general, regulations adopted by ARB must be necessary, cost-effective, and technologically feasible.<sup>137</sup> For regulations to control sources of air toxics like diesel PM, State law requires ARB to design the regulation based on use of the best available control technology (BACT), in consideration of risk and cost.<sup>138</sup>

This section discusses ARB staff's evaluation of the feasibility of going beyond the existing regulations to require zero-emission technology for these types of equipment at the four high-priority railyards. This project alternative would require the purchase of new equipment, construction of significant new electric infrastructure at the railyard, and redesign of current railyard operating practices.

In addition to meeting the aforementioned requirements for adoption of regulations under State law, ARB would be required to obtain authorization from U.S. EPA prior to ARB enforcing the regulation. ARB would also have to consider if a federally-authorized regulation could be harmonized with the ICCTA preemption.<sup>139</sup> In evaluating its authority to adopt amendments to the cargo handling regulation, among the criteria that the Board would consider in adopting the proposed amendments would be the emission/health risk reductions that would be achieved from the amendments and the burdens related to cost that would be imposed upon the railroads.

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<sup>136</sup> Health and Safety Code §39658, 39666, 39667, 43013(b), and 43018.

<sup>137</sup> Health and Safety Code §43013(a) and (b).

<sup>138</sup> Health and Safety Code §39666 and 39667.

<sup>139</sup> See *AAR v. SCAQMD*, *supra*, 622 F.3d at 1098. Although, to date, the railroads have not challenged the existing cargo handling regulation, they have stated that they have voluntarily elected to comply and have reserved their right to challenge the regulation.

In evaluating the burdens imposed by a proposed regulation, ARB staff and the Board would consider, among other things, the benefits and costs of the proposed regulation. The baseline for this analysis would be full implementation of the existing regulation, equipment that meets the required Tier 4 PM levels (85 percent or better PM control), and substantial recent investments by the railroads in the new Tier 4 equipment. As discussed below, the technology to achieve additional on-site emission reductions from electrification of cargo handling equipment presently exists for several railyard applications.

If use of electrified RMGs virtually eliminated all of the diesel cargo handling equipment emissions projected to remain in 2020, the maximum diesel PM reductions for all four railyards combined would be under 2.6 tons per year, at a cost of over \$1.1 billion. For context, ARB's 2007 regulation to reduce emissions and health risk from drayage trucks serving ports and intermodal railyards (including the four priority yards) had roughly the same estimated total cost to reduce diesel PM by 949 tons per year. Alternatively, if ARB required conversion of Tier 4 diesel yard trucks to electric trucks at these four railyards, the maximum diesel PM reductions for all four railyards combined would be about 1.8 tons per year, at a minimum cost of over \$56 million.

ARB staff does not anticipate that a regulatory proposal to mandate electrification of cargo handling equipment would be cost-effective at this time. The following sections discuss the basis for staff's estimates of potential emission reductions and costs associated with this alternative.

i. Existing ARB Regulation

In December 2005, ARB approved a regulation to reduce NO<sub>x</sub> and PM emissions from diesel-fueled cargo handling equipment operated at ports and intermodal railyards. Cargo handling equipment includes yard trucks/hostlers, cranes, picks, forklifts and related equipment used to handle goods moved in containers. This existing regulation establishes BACT for covered equipment and requires all equipment to have Tier 4 level PM control (85 percent control) or better by the end of 2017 or earlier. Yard trucks must meet in-use performance standards through accelerated turnover of older yard trucks to ones equipped with cleaner, on-road engines. Non-yard truck equipment must also meet BACT, which could include retrofits and/or replacement to cleaner on-road or off-road engines.

The railroads typically turn over the cargo handling equipment at these railyards more frequently than the industry-wide assumptions in the regulation. Staff estimates that all of the yard trucks operating at the four high-priority railyards could meet the Tier 4 PM level as early as 2012-2013, and all cranes, picks, and forklifts could meet the Tier 4 PM level by as early as 2015.



ii. Emissions from Cargo Handling Equipment

The projected diesel PM emissions from all cargo handling equipment at the four priority railyards under the existing ARB regulation are shown in Table F-14. By 2020, cargo handling equipment accounts for about ten percent of the diesel PM emissions at these yards. These figures include all diesel cargo handling equipment at each railyard and therefore represent the upper bound of emissions that could be eliminated on site from conversion to electric equipment.

**Table F-14**  
**Diesel PM Emissions from Cargo Handling Equipment**  
**at the Four High-Priority Railyards**  
**With the Existing Program**  
(tons per year)

<b>Railyard</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
BNSF San Bernardino	3.0	1.2	0.6	0.4
BNSF Hobart	5.9	2.4	1.2	0.8
UP Commerce	4.8	3.0	1.5	0.9
UP ICTF/Dolores	4.4	1.6	1.0	0.5*
<b>Total</b>	<b>18.1</b>	<b>8.2</b>	<b>4.3</b>	<b>2.6</b>

\* If implemented, the UP Modernization Plan would reduce to near zero emissions.

iii. Timing for Implementation

In the analysis of this alternative, staff has assumed that any new regulatory requirements would be implemented post-2015. With at least a year to develop and adopt the regulatory amendments under the Administrative Procedure Act, implementation of the regulation would then require significant modifications to the railyard infrastructure with additional time for the necessary environmental reviews and federal, State, and local permitting requirements.

Still more time would be required for construction and installation. ARB staff estimates that these additional steps would take at least four years from the time the regulation is approved to completion, putting implementation in the 2016-2017 period. This proposed schedule is based on recent experiences with the proposed UP ICTF

Modernization project and the proposed BNSF Southern California International Gateway near-dock railyard facility. This analysis assumes that electric RMGs would displace both the Tier 4 cranes and yard trucks that would already be operating in high-priority railyards by 2015.

#### iv. Potential Emission Reductions

Electric RMGs could replace nearly all of the existing equipment and achieve close to the combined 2.6 tons per year upper bound estimate of on-site diesel PM emission reductions indicated on Table F-14 for all four railyards.

ARB staff estimates that Tier 4 compliant yard trucks will account for about 70 percent of the expected 2020 emissions of diesel PM from cargo handling equipment shown in Table F-14. Conversion of Tier 4 yard trucks to electric models could achieve combined diesel PM reductions of roughly 1.8 tons per year for all four railyards.

The railyard-specific numbers for cargo handling equipment are shown in Appendix A of this *Supplement to the June 2010 Staff Report*.

Converting the cargo handling equipment to electric models would reduce or nearly eliminate on-site emissions of diesel PM at the four railyards, but would shift a small portion of those emissions to communities with fossil-fuel fired power plants to provide the necessary electricity. As California transitions to more renewable and zero-emission sources to generate electric power, that impact would be expected to diminish.

#### v. Costs to Purchase and Install New Equipment

The sections below provide the numbers that ARB staff used to estimate the railyard-specific cost of installing electric RMGs to replace Tier 4 compliant equipment. RMGs would virtually eliminate the need for other cargo handling equipment, including yard trucks, forklifts, and picks currently used to move containers on site. A less effective option would be to replace the Tier 4 compliant yard trucks with zero-emission yard trucks (presumed to be electric for this analysis).

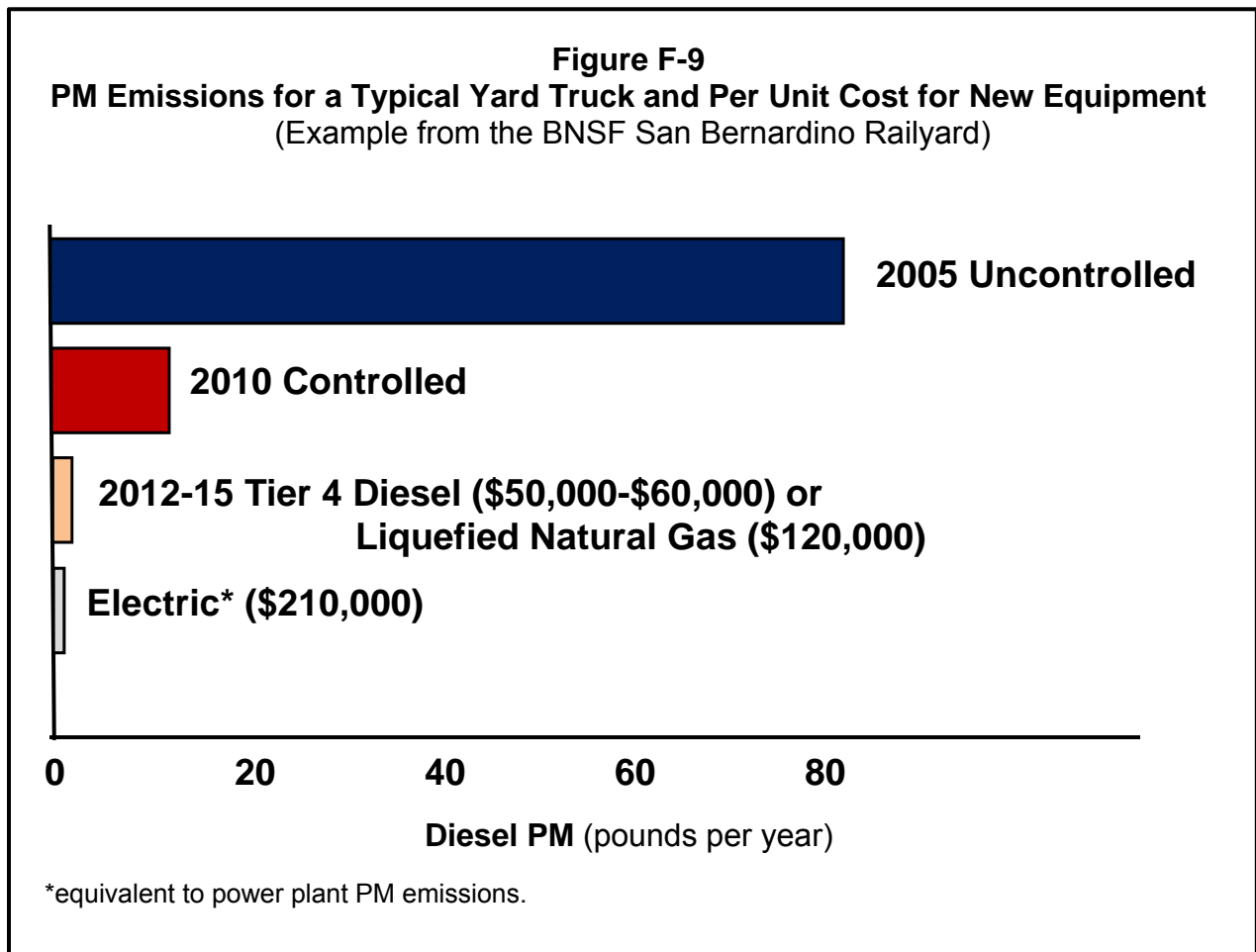
*Rail-Mounted Gantry Cranes.* For background, ARB staff analyzed several UP and BNSF railyards around the U.S. where the railroads have installed or are planning to install RMG cranes and the supporting electric infrastructure at existing and new facilities. To estimate the cost of purchasing and installing RMGs at the four existing high-priority yards in California, we relied on the published estimates of costs to convert the existing UP ICTF facility to electric RMG cranes as part of the UP ICTF Modernization Plan.<sup>140</sup>

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<sup>140</sup> *Application for Development Project Approval, Intermodal Container Transfer Facility (ICTF) Modernization Project* (December 26, 2007).

ARB staff estimates that each railyard will need one to two RMGs for each rubber tire gantry (RTG) crane that is replaced, and may need one RMG per 50,000 to 150,000 container lifts. The cost to purchase the RMGs would be about \$5 million per unit, with another \$5 million per crane to install the electric infrastructure and reconfigure operations at the yards.

*Electric Yard Trucks.* Staff used an estimate of \$210,000 per unit to purchase a new electric yard truck. There would be additional costs to install on-site electric infrastructure to charge these yard trucks. The railroads indicate that the railyard duty cycle and operations would essentially require that each existing diesel yard truck be replaced with two electric trucks to accommodate the recharging time when an electric truck would be out of service, based on current technology. Because we do not know the status of development of longer-life battery technology or quick-charge capability for electric yard trucks that might exist post-2015, ARB staff used a one-to-one replacement ratio to estimate the costs, but acknowledges the actual costs could be higher. Figure F-9 shows the relative PM emissions from yard truck technologies and costs to purchase new equipment based on operating assumptions typical of the BNSF San Bernardino Railyard.



vi. BNSF San Bernardino – Specific Cost Estimates

Between 2015 and 2020, staff estimates that diesel PM emissions from cargo handling equipment at the BNSF San Bernardino Railyard will be reduced to about 0.4 tons per year with the existing regulation.

*Electrified RMG Cranes.* From 2005 to 2010, the BNSF San Bernardino Railyard operated 13 RTG cranes, plus 6 picks. To replace 13 Tier 4 RTGs in 2015 with electric RMGs (which would also displace nearly all of the 57 Tier 4 yard trucks) would require the installation of an estimated 26 electrified RMGs.

Staff estimates that each electric RMG would cost about \$5 million, or a total of about \$130 million for 26 electric RMGs. Staff estimates that the necessary electric infrastructure to support electric RMGs would cost an additional \$5 million per electric RMG, or a total of about \$130 million.

However, the physical configuration of the BNSF San Bernardino Railyard includes a bridge crossing over the railyard with container operations on both sides of the Fourth Street Bridge. Currently, mobile cargo equipment can pass under the bridge and service operations on both sides. An electric RMG is too tall to be installed such that it could service both sides. An electric RMG approach would require either doubling the number of RMGs to cover both sides of the property (at double the above cost) or a significant cost to remove or relocate the bridge.

Total electric RMG capital costs for the BNSF San Bernardino Railyard would be in the range of \$260 million-\$520 million.

*Electric Yard Trucks.* In 2005-2010, the BNSF San Bernardino Railyard operated about 57 diesel yard trucks. To replace 57 Tier 4 diesel-fueled yard trucks with electric yard trucks at a cost of about \$210,000 per unit, the total capital cost would be \$12 million.

vii. BNSF Hobart – Specific Cost Estimates

Between 2015 and 2020, staff estimates that diesel PM emissions from cargo handling equipment at the BNSF Hobart Railyard will be reduced to about 0.8 tons per year with the existing regulation.

*Electrified RMG Cranes.* From 2005 to 2010, the BNSF Hobart Railyard operated 27 RTG cranes, plus 11 picks. To replace 27 Tier 4 RTGs in 2015 with electric RMGs (which would also displace nearly all of the 114 Tier 4 yard trucks) would require the installation of an estimated 54 electrified RMGs.

Staff estimates that each electric RMG would cost about \$5 million, or a total of about \$270 million for 54 electric RMGs. Staff estimates that the necessary electric

infrastructure to support electric RMGs would cost an additional \$5 million per electric RMG, or a total of about \$270 million.

Total electric RMG capital costs for the BNSF Hobart Railyard would be about \$540 million.

*Electric Yard Trucks.* To replace 114 Tier 4 diesel-fueled yard trucks with electric yard trucks at a cost of about \$210,000 per unit, the total capital cost would be \$24 million.

#### viii. UP Commerce-Specific Cost Estimates

Between 2015 and 2020, staff estimates that diesel PM emissions from cargo handling equipment at the UP Commerce Railyard will be reduced to about 0.9 tons per year with the existing regulation.

*Electrified RMG Cranes.* From 2005 to 2010, the UP Commerce Railyard operated 9 RTG cranes, plus one pick. To replace 9 Tier 4 RTGs in 2015 with electric RMGs (which would also displace nearly all of the 26 Tier 4 yard trucks or hostlers) would require the installation of an estimated 18 electrified RMGs.

Staff estimates that each electric RMG would cost about \$5 million, or a total of about \$90 million for 18 electric RMGs. Staff estimates that the necessary electric infrastructure to support electric RMGs would cost an additional \$5 million per electric RMG, or a total cost of \$90 million.

Total electric RMG capital costs for the UP Commerce Railyard would be about \$180 million.

*Electric Yard Trucks.* The capital costs to replace 26 diesel yard trucks, with electric yard trucks at about \$210,000 per unit, would be a total cost of about \$5.5 million.

#### ix. UP ICTF/Dolores-Specific Cost Estimates

Between 2015 and 2020, staff estimates the diesel PM emissions from cargo handling equipment at the UP ICTF/Dolores Railyards will be reduced to about 0.5 tons per year with the existing regulation.

*Electrified RMG Cranes.* From 2005 to 2010, the UP ICTF/Dolores Railyards operated 10 RTG cranes, plus three picks. To replace 10 Tier 4 RTGs in 2015 with electric RMGs (which would also displace nearly all of the 73 Tier 4 yard trucks) would require the installation of an estimated 20 electric RMGs. This scenario is based on the current lift capacity of about 750,000 vs. the UP Modernization Plan with 1.5 million lift capacity.

Staff estimates that each electric RMG would cost about \$5 million, or a total of about \$100 million for 20 electric RMGs. Staff estimates that the necessary electric

infrastructure to support electric RMGs would cost an additional \$5 million per electric RMG, or a total cost of \$100 million.

Total electric RMG capital costs for the UP ICTF/Dolores Railyards would be about \$200 million at current levels of operations without the expansion proposed under the Modernization Plan.

*Electric Yard Trucks.* The total capital costs to replace 73 diesel yard trucks with electric yard trucks at about \$210,000 per unit would equal about \$15 million.

*c. Potential Impacts*

*i. Impact on Aesthetics*

The four high-priority railyards are in continuous operation under well-lighted conditions, 24 hours a day, seven days a week. Under existing conditions, there is already substantial nighttime light and glare from fixed lighting sources.

A regulation for electrification of railyard cargo handling equipment is not likely to result in more brightly lit cargo handling equipment. Changes resulting from a cargo handling equipment electrification regulation are not likely to cause changes in substantial light or glare that would adversely affect day or nighttime views in the area of any of the railyards.

*ii. Impact on Noise*

The four high-priority railyards covered by the Commitments are large, existing industrial-type operations that already operate 24 hours a day, seven days a week, with on-site and entering/exiting diesel equipment. The physical scale, frequency of activity, noise, and vibration from these operations are part of the existing conditions.

A regulation for cargo handling equipment electrification would result in deployment of new, electrified equipment. Electrified equipment is significantly quieter than the diesel-fueled equipment currently in use at the four high-priority railyards. Therefore, the noise reduction resulting from Alternative C would be a positive impact.

*iii. Impact on Transportation and Traffic*

On-road container trucks enter and exit the four high-priority railyards, either through a gate complex in one area of the railyard or through entrance and exit gates in separate areas of the railyard. At each railyard, the container trucks take a freeway route on exiting. A regulation for electrification of cargo handling equipment would result in deployment of RMG cranes, which are taller than the RTGs presently in use. At BNSF San Bernardino Railyard, this would necessitate removal or relocation of the Fourth Street Bridge, potentially resulting in temporary or permanent restrictions on

traffic flow in the vicinity of the BNSF San Bernardino Railyard. A cargo handling equipment electrification regulation would therefore have a significant negative impact on transportation and traffic at the BNSF San Bernardino Railyard. At the other three high-priority railyards, a cargo handling equipment electrification regulation would have no impact on transportation or traffic, as the RMG operations would be limited within the railyards.

*d. Conclusion*

If ARB staff proposed and the Board adopted a regulatory amendment to implement this alternative consistent with State and federal law, the maximum possible estimate of diesel PM emission reductions achievable at the four high-priority railyards would be less than 2.6 tons per year at a cost of well over \$1.1 billion. However, some of those emissions would remain but be transferred to the communities where the electric power is generated for use at the railyards. Compared to the proposed project, this alternative would be substantially less effective at achieving the project objective at the four high-priority railyards, with a maximum of 2.6 tons per year of diesel PM reductions in 2020 versus 12.5 tons per year of diesel PM reductions achievable with the Revised 2010 Commitments.

Installation of electric equipment would result in a reduction in noise at all four railyards. This alternative may also result in potential transportation and traffic impacts at the BNSF San Bernardino Railyard if the existing Fourth Street Bridge must be moved to accommodate electric RMG cranes. Because of the reconfiguration that would be needed at the railyards to enable the electric RMG installation and operation, there could be potential short-term construction-related impacts on noise, traffic, and air quality, but the nature and scope of those impacts are unknown at this time.

3. Alternative D: ARB Regulation Requiring Risk Reduction Audits, Plans, and Measures

*a. Description of Project Alternative*

Under this alternative, the Board could consider adopting a regulation to require railyards to perform risk reduction audits and plans, and implement measures to reduce railyard risks, similar to the existing requirements under the Health and Safety Code “Hot Spots” program that applies to stationary sources and is overseen and enforced by the local air quality management and air pollution control districts.<sup>141</sup> The “Hot Spots” model provides a potential model for an ARB regulation to reduce the health risk from the major railyards in California.

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<sup>141</sup> Health and Safety Code §44300 et seq.

*b. Evaluation of Feasibility*

There are two parts to this evaluation. First, ARB staff provides a summary of the “Hot Spots” program. Then, we explore ARB’s authority to adopt a regulation consistent with State and federal law to establish similar requirements for railyard facilities dominated by mobile source emissions.

*i. “Hot Spots” Statutes*

The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588, 1987, Connelly) was enacted in September 1987. Under this legislation, “stationary sources” are required to report the types and quantities of certain substances their facilities routinely release into the air. The goals of the Air Toxics "Hot Spots" Act are to collect emission data, to identify facilities having localized impacts, to ascertain health risks, and to notify nearby residents of significant risks. In September 1992, the "Hot Spots" Act was amended by Senate Bill (SB) 1731 (Calderon) to address the reduction of significant risks. Statute now also requires that owners of significant-risk facilities reduce those risks below the level of significance.

The current statutory requirements are in Health and Safety Code §44391, which requires facilities presenting a significant risk (as determined by the air district) to conduct a risk reduction audit and develop a plan to implement measures to reduce that risk within five years of the date the plan is submitted to the district. The period to implement the plan may be shortened by the district if it finds that it is technically feasible and economically practicable to implement the plan more quickly or finds that the emissions from the facility pose an unreasonable health risk. However, a district may lengthen the plan implementation period by up to an additional five years based on factors such as economic burden to the facility operator or technical feasibility of the plan.

*ii. Air District Risk Levels*

Each district has selected a risk threshold value for the projected maximum individual cancer risk (expressed as chances in a million) at which facilities must conduct a risk reduction audit and plan.<sup>142</sup> The current risk threshold value for the South Coast Air Quality Management District and the Sacramento Metropolitan Air Quality Management District is 25 in a million. Risk threshold values for the San Joaquin Valley, Bay Area, and Mojave Desert are 100 in a million. The implementation plan component of the “Hot Spots” program, through Health and Safety Code §44391, has proved to be an effective mechanism for reducing toxic emissions at stationary facilities.

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<sup>142</sup> [http://www.arb.ca.gov/ab2588/district\\_levels.htm](http://www.arb.ca.gov/ab2588/district_levels.htm). Web archive, May 6, 2011.



iii. ARB Authority to Adopt a Similar Program for Railyards

ARB staff believes that a similar program could be developed under the broad authority granted ARB under Health and Safety Code §39650 et seq. to develop a statewide program to control toxic air contaminants, subject to federal preemption. As with other airborne toxic control measures, ARB would have to consider, among other things, the cost-effectiveness of the adopted program and the types of emission/risk reduction measures that the railroads would need to implement.

For the reasons set forth in the earlier analysis of Alternative B, federal preemption would likely significantly restrict ARB's authority to regulate the largest railyard emission source, i.e., locomotives. The CAA preemption alone would preempt a State requirement for risk reduction measures that apply to federal complying locomotives, which on average would represent about 70 percent of remaining railyard diesel PM emissions at the four high-priority railyards by 2020.

Under existing ARB and U.S. EPA regulations and agreements, railyard emissions from cargo handling equipment, drayage trucks, and transport refrigeration units (TRUs) will reduce by 90 percent or more between 2015 and 2020. As explained under Alternative C above regarding possible amendments to the cargo handling equipment regulation, further regulation of these sources (e.g., electrification of TRUs) is currently not cost-effective, arguably precluding ARB adoption of an emission/risk reduction program that relies upon emission reductions from these sources under authority granted in the Health and Safety Code. Moreover, while these regulations apply across several industrial sectors, it could be argued that further regulation of these sources at railyards alone is discriminatory and – when considered with the cost-effectiveness of the regulations – unduly burdensome, making harmonization with ICCTA problematic.<sup>143</sup>

iv. Emission Reduction Benefits

It is not possible to accurately quantify the emission reductions that would result from implementation of this alternative without defining a risk threshold and doing air quality modeling to back-calculate the reductions that would be needed from non-locomotive sources to meet it. However, staff has provided an upper bound number based on the universe of diesel PM sources at the four priority railyards – excluding preempted locomotives. Since there are no non-preempted locomotives routinely operating at the four priority railyards, there are no emissions from these sources to include. The sum of diesel PM emissions for all non-locomotive sources at the four yards in 2020 under the existing program is 7.4 tons per year. If the railroads electrified every non-locomotive mobile source, most of these emissions could be eliminated from the yard itself. However, an ARB regulation establishing a risk threshold for railyards or applying the existing district thresholds for stationary sources would need to identify a feasible path to meet the threshold in a cost-effective way, consistent with State and federal law.

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<sup>143</sup> *AAR v. SCAQMD*, *supra*, 622 F.3d at 1098.

*c. Potential Impacts*

i. Impact on Aesthetics

The four high-priority railyards are in continuous operation under well-lighted conditions, 24 hours a day, seven days a week. Under existing conditions, there is already substantial nighttime light and glare from fixed lighting sources. A regulation to reduce diesel PM emissions at railyards is not likely to result in more brightly lit railyard equipment. Changes resulting from such a regulation are not likely to cause changes in substantial light or glare that would adversely affect day or nighttime views in the area of any of the railyards.

ii. Impact on Noise

The four high-priority railyards covered by the Revised 2010 Commitments are large, existing industrial-type operations that already operate 24 hours a day, seven days a week, with on-site and entering/exiting diesel equipment. The physical scale, frequency of activity, noise, and vibration from these operations are part of the existing conditions. A regulation to reduce railyard diesel PM health risk would likely result in deployment of new, electrified railyard equipment. Electrified railyard equipment is significantly quieter than the diesel-fueled equipment currently in use at the four high-priority railyards. Therefore, the noise reduction resulting from Alternative D would be a positive impact.

iii. Impact on Transportation and Traffic

Trucks enter and exit the four high-priority railyards, either through a gate complex in one area of the railyard or through entrance and exit gates in separate areas of the railyard. At each railyard, the container trucks take a freeway route on exiting. A regulation to reduce railyard diesel PM health risk would likely result in deployment of rail mounted gantry (RMG) cranes, which are taller than the RTGs presently in use. As discussed under Alternative C, this would have a significant negative impact on transportation and traffic at the BNSF San Bernardino Railyard.

One of the approaches that the railroads could employ to meet a risk threshold without reductions from preempted locomotives is an electric truck fleet to serve the railyard. Based on current technology and battery range, this would likely require electric truck charging stations at or near the railyard and new operations to support truck queuing and time out of service to access the charging stations. These operations would likely increase the total volume of truck traffic needed to meet the railyard's cargo demands and could impact traffic at each of the high-priority railyards.

*d. Conclusion*

This alternative would be less effective in meeting the project objective than the Revised 2010 Commitments because any requirements to reduce the health risk from the high-priority railyards would need to exclude the diesel PM emissions from preempted locomotives, the largest remaining source. The total remaining diesel PM emissions in 2020 subject to control under this alternative would be 7.4 tons per year for all four railyards combined. If all of these on-site emissions were eliminated through electrification, it would still be substantially less effective than the 12.5 tons per year of diesel PM reductions achievable under the proposed project.

The conclusions for Alternative C would also apply to Alternative D because both would be likely to result in reconfiguration at the railyards to enable electric RMG installation and operation. Installation of electric equipment would result in a reduction in noise at all four railyards. This alternative may also result in potential transportation and traffic impacts at the BNSF San Bernardino Railyard if the existing Fourth Street Bridge must be moved to accommodate electric RMG cranes. Because of the reconfiguration that would be needed at the railyards to enable the electric RMG installation and operation, there could be potential short-term construction-related impacts, but the nature and scope of those impacts are unknown at this time.

## ATTACHMENT 1

### Environmental Checklist

ARB used the environmental checklist criteria included in Appendix G of the CEQA Guidelines as a basis for assessing the potential significant adverse environmental impacts. ARB's findings are supported by documents incorporated by reference into this environmental analysis.

The environmental impacts checked below indicate those that may be affected by the Revised 2010 Commitments. Further discussion follows each major category of potential impact.

For this project, the following designations are used:

**Potentially Significant Impact:** An impact that could be significant and discussed in the Impact Analysis chapter of the FED.

**Less Than Significant With Mitigation Incorporated:** An impact that requires mitigation to reduce the impact to a less-than-significant level.

**Less Than Significant:** Any impact that would not be considered significant under CEQA relative to existing standards.

**No Impact:** Any impact that does not apply to the project.

## **Evaluation of Environmental Impacts**

### **I. AESTHETICS.** Would the Revised 2010 Commitments:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Discussion: The four high-priority railyards are large, existing industrial-type operations that run 24 hours a day, seven days a week, with diesel equipment on-site and entering/exiting the railyards. The physical scale of these railyards and their equipment typically precludes community residents from experiencing scenic views adjacent to the railyards; therefore the project will have no impact on scenic vistas. Operational changes on-site of the railyards will not damage scenic resources including but not limited to trees, rock outcroppings, and historic buildings within a State scenic highway.

The potential for the creation of new sources of substantial light or glare is discussed in the FED Impact Analysis chapter.

**II. AGRICULTURE AND FOREST RESOURCES.** Would the Revised 2010 Commitments:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the <a href="#">Farmland Mapping and Monitoring Program</a> of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a <a href="#">Williamson Act</a> contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code §12220(g)), timberland (as defined by Public Resources Code §4526), or timberland zoned Timberland Production (as defined by Government Code §51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion: The four high-priority railyards are existing facilities that are not located on farmland or forest land. They are located in urban areas and physically constrained from increasing the footprint of their operations, except for the UP ICTF/Dolores Railyards.<sup>144</sup> Implementation of the Revised 2010 Commitments would not adversely impact the existing forest and agricultural resources.

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<sup>144</sup> *Application for Development Project Approval, Intermodal Container Transfer Facility (ICTF) Modernization Project* (December 26, 2007, p.3). In Appendix H of this report there is a Phase I Environmental Site Assessment for an adjacent property outside of the ICTF footprint which UP anticipates may be developed for the modernization project (shown in Figure 2 of the Environmental Site Assessment).

**III. AIR QUALITY.** Would the Revised 2010 Commitments:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>



Discussion: Implementation of the Revised 2010 Commitments would substantially decrease, not increase, air pollution and the associated health risk. The Commitments would reduce the exposure of residents of surrounding communities to toxic air pollutant concentrations and reduce the criteria pollutants that contribute to violations of air quality standards by cutting the diesel PM, NO<sub>x</sub>, and VOC emissions from railyard operations. Staff expects the impact on SO<sub>x</sub> emissions to be either neutral because the emission reduction technologies do not provide additional SO<sub>x</sub> control or beneficial because use of more fuel-efficient locomotives to meet the Commitments would result in lower emissions of SO<sub>x</sub> (and other pollutants). Applicable air quality plans prepared by local, regional, and State agencies specifically rely on new emission reductions from locomotives to meet air quality standards and toxic reduction targets. A more detailed discussion of the beneficial impacts on air quality is provided in the FED Impact Analysis chapter.

If the railroads choose to implement operational changes that involve construction, there could be potential short-term construction-related impacts to air quality due to the temporary generation of criteria and toxic air pollutants (e.g., use of diesel-fueled construction equipment and creation of fugitive dust), but the nature and scope of such impacts are unknown at this time.

**IV. BIOLOGICAL RESOURCES.** Would the Revised 2010 Commitments:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the <a href="#">California Department of Fish and Game</a> or <a href="#">U.S. Fish and Wildlife Service</a> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the <a href="#">California Department of Fish and Game</a> or <a href="#">US Fish and Wildlife Service</a> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by <a href="#">Section 404 of the Clean Water Act</a> (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion: The four high-priority railyards are existing facilities and are not located on riparian land, in a sensitive natural community, or in federally protected wetlands. They are in urban areas and physically constrained from increasing the footprint of their operations, except for the UP ICTF/Dolores Railyards.<sup>145</sup> The project will have no impact or substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service. Implementation of the Commitments will not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites because the Commitments will not result in a change in use of the sites. The project will not conflict with the provisions of any approved local, regional, State, or federal habitat conservation plans as none are applicable to the project sites.

<sup>145</sup> *Application for Development Project Approval, Intermodal Container Transfer Facility (ICTF) Modernization Project* (December 26, 2007), p. 3.

**V. CULTURAL RESOURCES.** Would the Revised 2010 Commitments:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guideline § <a href="#">15064.5</a> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guideline § <a href="#">15064.5</a> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion: The four high-priority railyards are existing large industrial-type operations that have been operating for decades:

**BNSF San Bernardino Railyard:** California Southern Railroad opened the San Bernardino railyard, with the opening of the Cajon Pass, in 1885.<sup>146</sup> Atchison, Topeka & Santa Fe (ATSF) began intermodal operations in 1986.<sup>147</sup> All of the identified cultural sites in San Bernardino's General Plan EIR are located north of East 40<sup>th</sup> Avenue off of Rim of the World Highway, near Arrowhead Springs Road – about five miles from the BNSF San Bernardino Railyard.

**BNSF Hobart Railyard:** The Los Angeles and Salt Lake Railroad rail company, incorporated in 1901, completed and operated a railway line between Los Angeles and Salt Lake City, Utah, via Las Vegas, Nevada.<sup>148</sup>

<sup>146</sup> [http://en.wikipedia.org/wiki/California\\_Southern\\_Railroad](http://en.wikipedia.org/wiki/California_Southern_Railroad). Web archive, March 16, 2011.

<sup>147</sup> Economics & Politics, Inc., *Hemet: Demographic, Economic & Quality of Life Data*, September 2005, p. 50.

<sup>148</sup> [http://en.wikipedia.org/wiki/San\\_Pedro,\\_Los\\_Angeles\\_and\\_Salt\\_Lake\\_Railroad](http://en.wikipedia.org/wiki/San_Pedro,_Los_Angeles_and_Salt_Lake_Railroad). Web archive, March 16, 2011.

Intermodal operations began in 1952 on two dedicated tracks.<sup>149</sup> According to the General Plan EIRs, the cities of Commerce and Vernon do not contain any known archaeological or paleontological resources.

UP Commerce Railyard: The Los Angeles and Salt Lake Railroad built this yard in 1924. UP shut the classification yard hump operations in 1990 to shift operational emphasis to intermodal activities.<sup>150</sup> According to the General Plan EIRs, the cities of Commerce and Vernon do not contain any known archaeological or paleontological resources.

UP ICTF/Dolores Railyards: ICTF opened in 1986.<sup>151</sup> Dolores was built by Pacific Electric in 1943 to support growing harbor activity during World War II.<sup>152</sup> There are no paleontological resources within the City of Carson, but there are two identified cultural sites. The first cultural site identified in the General Plan EIR is located at 18127 Alameda Street, about five miles north of the UP ICTF Railyard. The second site is located at the southeast corner of East 230<sup>th</sup> Street and Utility Way, about a mile west of the UP ICTF Railyard. All of the cultural sites identified in the Historic Preservation Document (part of the forthcoming Long Beach 2030 General Plan) are east of the Long Beach Freeway.

ARB anticipates that the railroads will purchase and operate cleaner locomotives and yard equipment to meet the emission reduction levels in the Revised 2010 Commitments. The railroads may undertake physical changes in the facility itself as part of operational changes to reduce health risks. Such changes may involve digging and construction, for example, when trenching for electrical infrastructure for electrification of cranes. Such land disturbances, however, are not expected to affect any historical resources, archaeological resources, paleontological resources or unique geological features, nor disturb any human remains, because the land disturbances would primarily involve the removal of existing pavement and only incidental removal of soil. There is not a reasonable likelihood that implementation of the Revised 2010 Commitments would have a significant adverse effect on Cultural Resources.

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<sup>149</sup> BNSF Railway, *Los Angeles (Hobart) and Commerce BNSF Intermodal Facilities*. Informational brochure provided by BNSF to ARB, May 2010.

<sup>150</sup> Solomon, Brian, *Union Pacific Railroad*, 2000, pp. 69-70.

<sup>151</sup> <http://www.uprr.com/customers/intermodal/featured/ictf/index.shtml>. Web archive, March 16, 2011.

<sup>152</sup> <http://www.erha.org/pesspd.htm>. Web archive, March 16, 2011.

**VI. GEOLOGY AND SOILS.** Would the Revised 2010 Commitments:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Rupture of a known earthquake fault, as delineated on the most recent <a href="#">Alquist-Priolo Earthquake Fault Zoning Map</a> issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to <a href="#">Division of Mines and Geology Special Publication 42</a> .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion: The four high-priority railyards are existing large industrial-type operations that have been operating at their current urban sites for decades. Because these particular railyards are intermodal railyards, most of the land between the tracks at each site is paved or built over. ARB anticipates that any technological changes or operational changes that the railroads would pursue to meet the emission reduction levels would not make significant physical changes in the facility. Although some operational changes may involve some digging or trenching, this would not result in substantial soil erosion or the loss of topsoil, because it would primarily involve the removal of existing pavement and only incidental removal of soil. Furthermore, the project will not alter or add uses to the sites, will not involve any land alteration that could increase exposure of people or structures to seismic and landslide risks, and will not increase risk to people or property from any type of soil instability. There is not a reasonable likelihood that implementation of the Revised 2010 Commitments will have a significant adverse effect on geology and soils.

**VII. GREENHOUSE GAS EMISSIONS.** Would the Revised 2010 Commitments:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion: The 2010 Revised Commitments would reduce the environmental impact of Southern California operations regardless of growth. A shift in freight from truck transport to rail transport has a net benefit for climate change. Moving cargo by rail emits approximately 75 percent less carbon dioxide (CO<sub>2</sub>) emissions than moving that same cargo by truck.<sup>153</sup>

Emissions of CO<sub>2</sub> and other greenhouse gases track closely with diesel fuel burned. Implementation of the Revised 2010 Commitments will continue the turnover of the switch locomotive fleet that primarily operates in the railyards to multi-engine generator set technology that reduces fuel consumption by 20 to 40 percent as compared to older switch locomotives.<sup>154</sup> While the level of greenhouse gas emissions from new advanced technology line haul locomotives is uncertain since the technology does not yet exist, ARB staff expects that these new units will have equivalent or better fuel economy than current models. With fuel comprising the second largest cost for railroad operations, the railroads are exerting pressure on the technology developers to ensure that next generation locomotives have no fuel consumption penalty, despite the addition of multiple air pollution control devices. Black carbon is a constituent of diesel PM and a fast-acting climate change contributor. The primary objective of the Revised 2010 Commitments is to reduce diesel PM, which will also reduce black carbon.

<sup>153</sup> *The Economic Impact of America's Freight Railroads*, American Association of Railroads, May 2010.

<sup>154</sup> Air Resources Board, *Technical Options to Achieve Additional Emissions and Risk Reductions from California Locomotives and Railyards*, August 2009, p. 45.



**VIII. HAZARDS AND HAZARDOUS MATERIALS.** Would the Revised 2010 Commitments:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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	Potentially Significant	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion: The railroads already transport and handle railcars containing hazardous materials, consistent with federal, State and local requirements. None of the four high-priority railyards is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5.

Since the railyards are in established urban areas, it is not foreseeable that any action attributable to the Revised 2010 Commitments would affect the likelihood of wildland fires; therefore the likelihood of wildland fires is not analyzed further in the FED. Railyard facilities are highly specialized facilities consisting of one or more areas including engine maintenance buildings, fueling areas, track and switching areas, and track maintenance/material storage yards. The raw materials associated with this industry are primarily used in fueling and maintenance operations. The maintenance/material storage yard areas use a wide variety of solvents, paints, treated railroad ties and wastes.<sup>155</sup>

Interstate line haul locomotive manufacturers, currently General Electric (GE) and Electro-Motive Diesel (EMD), must meet the U.S. EPA Tier 4 interstate line haul locomotive oxides of nitrogen (NOx) emission standard of 1.3 g/bhp-hr by 2015. U.S. EPA and locomotive manufacturers agree the Tier 4 NOx standard will be met with either exhaust gas recirculation (EGR) or selective catalytic reduction (SCR) aftertreatment systems. Locomotive EGR and SCR will likely be part of an aftertreatment system that will also include a diesel oxidation catalyst (DOC) and diesel particulate filter (DPF). DOCs and DPFs are devices designed primarily to reduce locomotive PM emissions to meet the U.S. EPA Tier 4 PM level of 0.03 g/bhp-hr.

<sup>155</sup> U.S. EPA Industry Profile, Rail Yards: <http://www.epa.gov/reg3hwmd/bf-lr/regional/industry/railyard.htm>. Web archive, March 16, 2011.

At this time, neither GE nor EMD has formally announced which NOx approach will be employed with Tier 4 locomotives. However, recent discussions indicate that both GE and EMD are focusing efforts on a non-SCR based approach to respond to railroads' concerns about increased life-cycle costs and the need for a national supply infrastructure to provide the urea required for SCR.

EGR works by recirculating a portion of an engine's exhaust gas back to the engine cylinders. In a diesel engine, the exhaust gas replaces some of the excess oxygen in the pre-combustion mixture. Because NOx forms primarily when a mixture of nitrogen and oxygen is subjected to high temperature, the lower combustion chamber temperatures caused by EGR reduce the amount of NOx the combustion generates.

The federal government comprehensively regulates the transportation of hazardous materials. Under the railroads' common carrier obligation to transport hazardous materials, the railroads are subject to numerous special procedures contained in Department of Transportation / Pipeline and Hazardous Materials Safety Administration (DOT/PHMSA) and Department of Homeland Security / Transportation Security Administration (DHS/TSA) rules, relating to the handling and storage of hazardous materials.<sup>156</sup> The PHMSA issues hazardous materials regulations for railroads<sup>157</sup> that are enforced by the Federal Railroad Administration (FRA); TSA issues hazardous materials regulations for railroads<sup>158</sup> from a security perspective.

The federal regulations governing the transportation of hazardous materials by rail govern operating practices, tank car requirements, and other aspects of hazardous materials transportation. PHMSA regulations require that:

- Railroads must compile annual data on certain shipments of explosive, toxic by inhalation, and radioactive materials; use the data to analyze safety and security risks along rail routes where those materials are transported; assess alternative routing options; and make routing decisions based on those assessments.
- Rail carriers must have security plans and address the security of shipments from origin to destination.
- When a railroad receives hazardous materials in a train, the railroad must conduct a safety and security inspection of the railcars containing hazardous materials.

In analyzing impact, staff assumed the Revised 2010 Commitments would result in the accelerated introduction of Tier 4 interstate line haul locomotives, which may rely on SCR technology to reduce NOx emissions and require the use of urea, which by itself is not a hazardous substance. But the combustion of urea in SCR technology produces ammonia emissions, which are limited by emission standards.

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<sup>156</sup> BNSF Railway Company, Ex-Parte No. 677 (Sub-No. 1), Common Carrier Obligation of Railroads – Transportation of Hazardous Materials. Presentation by BNSF to Surface Transportation Board, DOE, July 22, 2008.

<sup>157</sup> Title 49, Code of Federal Regulations, Part 174.

<sup>158</sup> Title 49, Code of Federal Regulations, Part 1580.

Ammonia is listed as a hazardous substance both federally and in California. Federal listings include:

- Air Contaminants (Occupational Safety and Health Act)
- Extremely Hazardous Substances (Superfund)
- Hazardous Substances (Superfund)
- Registered Pesticides (Federal Insecticide, Fungicide, and Rodenticide Act)
- Regulated Toxic, Explosive, or Flammable Substances (Clean Air Act)
- Toxic Release Inventory Chemicals

Ammonia is listed in the 2007 (Comprehensive Environmental Response, Compensation, and Liability Act) CERCLA priority list as a hazardous substance.<sup>159</sup> The CERCLA priority list is developed based on toxicity, frequency of occurrence at pre-Superfund sites, and potential for human exposure. In California, ammonia is listed as hazardous substance under California Occupational Safety and Health Regulations.<sup>160</sup>

Railroads currently store and dispense large volumes of diesel fuel and oil, and handle a variety of hazardous materials for use with stationary sources within most railyards. The Revised 2010 Commitments will not lead to changes in how UP and BNSF handle hazardous materials or comply with existing regulations.

One of the key challenges with SCR on an interstate line haul locomotive is being able to design a system that precisely meters urea to approach a one to one conversion ratio between urea to NO<sub>x</sub>, and to minimize potentially toxic emissions from ammonia slip.<sup>161</sup>

U.S. EPA responded to the potential for SCR technology to convert urea into ammonia in its 2008 locomotive rulemaking. Please see the U.S. EPA response below with respect to unregulated pollutants:<sup>162</sup>

There is potential for the formation of unregulated pollutants of significant concern to EPA any time engine technologies change, including when new emission control technologies are added. Some examples of these unregulated pollutants include nitrous oxide (N<sub>2</sub>O) and ammonia. In addition, failure to dose urea in an SCR system while operating under load may cause elevated nitrogen dioxide (NO<sub>2</sub>) emissions.

Similarly, use of a catalyzed diesel particulate filter that produces NO<sub>2</sub> in excess of what is needed for passive regeneration – and operated without a downstream SCR system – may lead to elevated NO<sub>2</sub> emissions. Such increased NO<sub>2</sub> emissions could be a concern for operation in enclosed environments such as locomotive operation in minimally ventilated or unventilated tunnels. Similarly, use of NO<sub>x</sub> reduction catalysts with poor selectivity could result in elevated

<sup>159</sup> <http://www.atsdr.cdc.gov/cercla/07list.html>. Web archive, May 6, 2011.

<sup>160</sup> Title 8, California Code of Regulations, §339(b)(3).

<sup>161</sup> *Technical Options Document*, August 2009, p. 166.

<sup>162</sup> *Federal Register*, Volume 73, Number 88, pp. 25098-25352, May 6, 2008.

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N<sub>2</sub>O emissions. An aggressive urea dosing strategy within an SCR system (for high levels of NO<sub>x</sub> control) without a properly designed/calibrated feedback control system, ammonia slip catalyst, or adequate exhaust/urea mixing could also result in elevated ammonia emissions.

SCR-related ammonia emissions can be minimized through the use of closed-loop feedback and control of urea injection, and all but eliminated through use of an oxidation catalyst downstream of the SCR catalyst. Such catalysts, commonly referred to as slip catalysts, are in use today and have been shown to be highly effective at eliminating ammonia emissions.<sup>163</sup>

We expect locomotive manufacturers to be conscious of these possibilities and to take appropriate action to minimize or prevent the formation of unregulated pollutants when designing emission control systems. Manufacturers must comply with the *Prohibited Controls* section of Title 40 Code of Federal Regulations, §1033.115(c), which states:

*"You may not design or produce your locomotives with emission control devices, systems, or elements of design that cause or contribute to an unreasonable risk to public health, welfare, or safety while operating. For example, this would apply if the locomotive emits a noxious or toxic substance it would otherwise not emit that contributes to such an unreasonable risk."*

Emission control systems designed to meet the 2007 and 2010 heavy-duty truck and Tier 2 light-duty vehicle emission standards already take these unregulated pollutants into account through compliance with Section 202(a)(4) of the Clean Air Act. Catalyzed diesel particulate filter systems that minimize formation of excess NO<sub>2</sub> while still relying primarily on passive regeneration have entered production for OEM and retrofit applications. Compact urea-SCR systems that have been developed to meet the U.S. 2010 heavy-duty truck standards use closed-loop controls that continuously monitor NO<sub>x</sub> reduction performance. Such systems have the capability to control stack emissions of ammonia to below 5 parts per million (ppm) during transient operation, even without the use of an ammonia slip catalyst. We understand that such systems may still emit some very small level of uncontrolled pollutants, and we would not generally consider a system that releases de minimis amounts of ammonia or N<sub>2</sub>O while employing technology consistent with limiting these emissions, to be in violation of Title 40 Code of Federal Regulations, §1033.115(c) – which is the same way we currently treat passenger cars and heavy-duty trucks with regard to N<sub>2</sub>O and hydrogen sulfide (H<sub>2</sub>S) emissions.

For each of the railyards, changes in operations resulting from the Revised 2010 Commitments are not likely to cause changes in how any hazardous materials are transported through or used at the railyard. It is possible that changes in operations at the railyards could result in the moving of maintenance facilities which use hazardous materials to another on-site location. However, specific provisions under State and federal law govern the safe handling of these materials. The Revised 2010 Commitments do not cause any changes to the handling of such materials.

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<sup>163</sup> Smedler, G., *NO<sub>x</sub> Emission Control Options*, 2007 HDD Emission Control Symposium – Gothenberg, Sweden, September 11, 2007, pp. 1-31.

**IX. HYDROLOGY AND WATER QUALITY.** Would the Commitments:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
j) Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion: The four high-priority railyards are large existing facilities with fixed tracks and heavy diesel equipment operating on the tracks, on paved ground, and on unpaved ground. It is not foreseeable that the railroads would alter the land use at these sites in response to the Revised 2010 Commitments; thus it is not reasonably foreseeable that implementation of the Commitments would have a significant adverse effect on Hydrology and Water Quality.

**X. LAND USE AND PLANNING.** Would the Revised 2010 Commitments:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion: The four high-priority railyards are existing large industrial-type operations that have been operating at their current urban sites for decades. Most of the land at each site is paved, built over, or covered with railroad tracks. ARB anticipates the railroads would purchase and operate cleaner locomotives and yard equipment to meet the emission reduction levels in the Revised 2010 Commitments, and that any operational changes implemented would not affect land use or change existing land uses since the facilities are part of the existing conditions. It is not reasonably foreseeable that implementation of the Revised 2010 Commitments would have a significant adverse effect on Land Use and Planning.



**XI. MINERAL RESOURCES.** Would the Revised 2010 Commitments:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion: The four high-priority railyards are existing large industrial-type operations that have been operating at their current urban sites for decades. Most of the land at each site is paved, built over, or covered with railroad tracks. There is not a reasonable likelihood that implementation of the Revised 2010 Commitments would have a significant adverse effect on Mineral Resources.

**XII. NOISE.** Would the Revised 2010 Commitments cause the:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Potential noise impacts are discussed in the Impact Analysis chapter of the FED.

**XIII. POPULATION AND HOUSING.** Would the Revised 2010 Commitments:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion: The four high-priority railyards are existing large industrial-type operations that have been operating at their current urban sites for decades. There is no residential housing on these properties. There is not a reasonable likelihood that implementation of the Revised 2010 Commitments would have a significant adverse effect on Population and Housing.

#### XIV. PUBLIC SERVICES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the proposed project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion: The implementation of the project will occur at four existing industrial railyards. Any changes that occur at the railyards will not require any changes to governmental facilities. There is no reasonable likelihood that implementation of the Revised 2010 Commitments would have a significant adverse effect on Public Services.

## XV. RECREATION

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion: The implementation of the project will occur at four industrial railyards and there is not a reasonable likelihood that it will result in impacts on parks or other facilities.

**XVI. TRANSPORTATION AND TRAFFIC.** Would the Revised 2010 Commitments:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion: The four high-priority railyards are existing facilities and the proposed project will not cause any new uses that would cause additional traffic that could conflict with applicable plans or programs. The existing conditions include rail crossings at grade with streets. The Revised 2010 Commitments are not expected to change how trains enter or exit one of the railyards and therefore would not change any existing delays in emergency access by motor vehicles needing to cross the railroad tracks.

Further analysis of the potential for changes to traffic in the vicinity of the railyards is discussed in the Impact Analysis chapter of the FED.

**XVII. UTILITIES AND SERVICE SYSTEMS.** Would the Revised 2010 Commitments:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>



Discussion: The four high-priority railyards are large, industrial-type facilities supported by existing water, wastewater, and waste disposal services. Most of the land at each site is paved, built over, or covered with railroad tracks. ARB anticipates that any technological or operational changes resulting from the Revised 2010 Commitments will not result in changes that would affect these services since the primary purpose of the railyard is to move freight.

If any railroad concludes that site operational changes (such as moving a truck entrance gate or installing a large electric rail-mounted gantry crane) offer a cost-effective option to reduce emissions, the railroad may pursue such changes. It is highly speculative that any such changes might require a corresponding change in the storm water drainage facilities. There is not a reasonable likelihood that implementation of the Revised 2010 Commitments would have a significant adverse effect on Utilities and Service Systems.

## XVIII. MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion: The proposed project will occur at four existing industrial paved-over railyards. The project does not have the potential to substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory. Potential cumulative impacts are discussed under the Cumulative and Growth-Inducing Impacts chapter of the FED. The proposed project would have clear and substantial air quality benefits to nearby residents and the surrounding region.

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