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DRAFT

Diesel Particulate Matter Mitigation Plan for the Union Pacific Railroad City of Industry Rail Yard

prepared for:

Union Pacific Railroad Company

October 7, 2008

prepared by:

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Union Pacific Railroad City of Industry Rail Yard

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I. Introduction

In accordance with the 2005 California Air Resources Board (CARB)/Railroad Statewide Agreement (MOU), Union Pacific Railroad Company (UPRR) has prepared this Mitigation Plan for the UPRR City of Industry (COI) Rail Yard. The purpose of this Plan is to outline the potential mitigation measures that can be used to reduce Diesel particulate matter (DPM) emissions from the COI Rail Yard. The baseline inventory for calendar year 2005 and initial estimates of health risk associated with Yard operations are detailed in the *Health Risk Assessment for the Union Pacific Railroad City of Industry Railyard* (CARB, 2008).[1] This Plan contains sections detailing how the baseline and projected emissions were calculated, a discussion of updates to the 2005 baseline inventory since the Health Risk Assessment (HRA) Report was published by CARB, a discussion of projected growth rates and proposed mitigation measures, and a discussion of the mechanisms that will be used to track progress.

As discussed below, the proposed mitigation measures, when fully implemented, will reduce the DPM emissions from the COI Yard by approximately 76% from 2005 levels, even after accounting for anticipated growth in yard activities (see Section V for a discussion of the predicted growth rate). These emission reductions will concurrently lower any predicted health risk associated with the facility's operations.

II. Summary of Rail Yard Operations

The City of Industry Yard is both an intermodal container handling facility and a classification[2] yard for manifest (mixed freight) trains. Incoming trains terminate on various tracks within the yard. Yard switchers then move sections of cars to various locations within the Yard, as needed. Sections of manifest train cars are moved and reconnected to others to build new outbound trains. Intermodal cars are moved to the intermodal loading/unloading tracks where containers are removed from and placed on the cars.

The City of Industry Yard proper includes several distinct areas. The area west of South Azusa Avenue includes a set of tracks for arriving and departing trains (known as the "A"

[1] Available at *http://www.arb.ca.gov/railyard/hra/up_coi_hra.pdf.*

[2] A classification yard receives trains, breaks them into sections, and reconnects them to make new trains for the rail cars ultimate destinations.

Yard), the Bowl[3] (used for some arriving and departing trains as well as classification), and the intermodal tracks for unloading and loading of containers. The Marne Yard, east of South Azusa Avenue, contains several parallel sets of tracks for originating trains, and classification (train building). In addition, two main lines are connected to the Yard: the Alhambra Subdivision mainline, which runs along the north side of the Yard; and the Los Angeles Subdivision main line, approximately ½ mile to the south of the Yard.

In addition to the City of Industry Yard itself, there is another small yard known as the Azusa Yard, which is located adjacent to the Los Angeles Subdivision main line east of South Azusa Avenue. Activities in the Azusa Yard are limited to local trains operating out of the main City of Industry Yard, which serve customers to the east and west along the Los Angeles Subdivision.

There is no locomotive servicing facility at City of Industry. However, a limited amount of locomotive servicing does occur in the Marne Yard. This activity consists primarily of refueling of locomotives from trucks (known as "direct to locomotive" or DTL fueling), with some minor maintenance and repairs.

Facilities within the Yard include classification tracks, a gate complex for inbound and outbound intermodal truck traffic, intermodal loading and unloading tracks, a crane maintenance shop, and various buildings and facilities supporting railroad and contractor operations.

Emission sources include, but are not limited to, locomotives, on-road Diesel-fueled trucks, heavy-heavy-duty Diesel-fueled trucks, cargo handling equipment (CHE), heavy equipment, and TRUs and reefer cars.

III. Emissions Summary

Table 1 shows the DPM emissions from the COI Yard, by equipment category, for the 2005 baseline year, calendar year 2007, and for future years as the mitigation measures proposed in this Plan are implemented over time. Since the CARB HRA report was released in April 2008, additional information has become available and the 2005 baseline emission inventory has been adjusted accordingly. Table 1 shows the original 2005 emission estimates as well as the adjusted 2005 emission estimates. Each inventory update is discussed below.

As shown in Table 1, when the proposed mitigation measures are implemented, DPM emissions will be reduced by approximately 76% from 2005 levels, even after accounting

[3] A "bowl" is traditionally a large number of parallel tracks used for classification. Railcars are pushed over a "hump" (a raised section of track), separated from one another, and allowed to roll by gravity into the appropriate track within the bowl. The City of Industry Yard no longer uses the Bowl in this manner. All train breaking and building activities are handled by flat switching (moving sections of cars using yard switcher engines).

for expected growth in yard activities (see Section V for a discussion on the predicted growth rate). These emission reductions will concurrently lower any existing predicted health risk related to facility operations. A detailed discussion of each mitigation measure is provided in Section VI.

Table 1
Summary of Emissions from the UPRR City of Industry Rail Yard

Equipment Category	DPM Emissions (TPY)					
	2005[a]	2005-Adj[b]	2007	2010[e]	2015[e]	2020[e]
Locomotives	5.9	5.9	4.1	2.5	1.9	1.5
Line Haul[c]	*2.6*	*2.6*	*2.6*	*2.1*	*1.5*	*1.1*
Switch	*3.3*	*3.3*	*1.5*	*0.4*	*0.4*	*0.5*
Service and Load Tests	*0.01*	*0.01*	*0.01*	*0.01*	*0.00*	*0.00*
Light DutyYard Trucks	0.2	0.2	0.2	0.2	0.3	0.3
HHD Diesel-Fueled Drayage Trucks	1.8	1.8	1.4	1.0	0.5	0.3
Cargo Handling Equipment (CHE)	2.6	1.5	1.6	0.9	0.5	0.5
Heavy Equipment	0.2	0.2	0.1	0.1	0.1	0.1
Transport Refrigeration Units (TRUs)	0.3	0.3	0.3	0.1	0.01	0.01
Stationary/Portable I.C. Engines	0.003	0.003	0.003	0.003	0.003	0.003
Total[f]	**10.9**	**9.8**	**7.6**	**4.8**	**3.3**	**2.6**

Notes:

a. From the *Health Risk Assessment for the Union Pacific Railroad City of Industry Railyard* (CARB, 2008).
b. Based on new information, the emission estimates presented in the CARB HRA have been adjusted. See the Inventory Updates section below for details.
c. Line haul emission estimates include both in-yard activity and by-passing through trains.
d. Emissions from cargo handling equipment were adjusted to reflect the use of a more appropriate engine load factor for yard hostlers. See Section III for a complete discussion.
e. Includes growth in Yard related activities (see Section V) and the proposed mitigation measures (see Section VI).
f. The numbers shown may not add precisely due to rounding.

Inventory Updates

In the adjusted 2005 inventory, the default engine load factor for yard hostlers has been revised based on new, more representative data. The default load factor (65%) for yard hostlers contained in the OFFROAD model is based on data collected for equipment operating at various facilities, and not specifically at an intermodal rail yard.[4] Additional data have been collected by both UPRR and Burlington Northern Santa Fe (BNSF) Railway to determine an appropriate engine load factor for yard hostlers operating at intermodal rail yards. The data collected by both railroads show that the default load factor from the OFFROAD model and the load factor from the Ports study are too high for yard hostlers operating at intermodal rail yards. Based on the UPRR and BNSF data, a more appropriate load factor for yard hostlers operating at intermodal rail yards is between 15 and 20%. Therefore, with the concurrence of CARB, the 2005 baseline emission estimates for yard hostlers that were presented in the CARB HRA report have been recalculated using a load factor of 20%.

Also, in December 2007, the Regulation to Control Emissions from In-Use On-Road Diesel-Fueled Heavy-Duty Drayage Trucks (Drayage Truck Rule) was adopted by CARB. The Regulation, when implemented, will reduce emissions from drayage trucks transporting cargo between California's Ports and intermodal rail yards. If the Regulation is implemented as planned, CARB expects an 86% reduction of DPM emissions from drayage truck operations from 2007 levels by 2014. These reductions will be above and beyond the reductions shown in Table 1. Thus, the projected emission estimates for the 2010–2020 period are conservative, but temporally and operationally realistic.

IV. Emission Inventory Methodology

A general discussion of the analytical methodology and assumptions for each equipment category used to calculate emissions for the 2005 baseline and calendar year 2007 inventories, and to forecast emissions for calendar years for future years, is provided below and in Appendix A. Detailed emission calculations for the 2005 baseline year can be found in the *Toxic Air Contaminant Emission Inventory and Dispersion Modeling Report for the City of Industry Rail Yard, City of Industry, California* (Sierra Research, 2007).[5]

[4] A yard hostler engine load factor of 39% was calculated based on data collected at the Ports of Los Angeles and Long Beach, and was used in the HRA report for the UPRR ICTF rail yard, at CARB's direction. The 65% default factor from the OFFROAD model was used in the HRA report for the UPRR COI rail yard.

[5] Available at *http://www.arb.ca.gov/railyard/hra/sr_ind_rpt.pdf.*

1. Locomotives

Table 2
Summary of Emissions from Locomotives
at the UPRR City of Industry Rail Yard

Equipment Category	DPM Emissions (TPY)					
	2005[a]	2005-Adj[b]	2007	2010[c]	2015[c]	2020[c]
Line Haul[d]	2.6	2.6	2.6	2.1	1.5	1.1
Switch	3.3	3.3	1.5	0.4	0.4	0.5
Service and Load Tests	0.01	0.01	0.01	0.01	<0.01	<0.01
Total	**5.9**	**5.9**	**4.1**	**2.5**	**1.9**	**1.5**

Notes:
a. From the *Health Risk Assessment for the Union Pacific Railroad City of Industry Railyard* (CARB, 2008).
b. 2005 adjustments do not affect locomotive emission estimates.
c. Includes growth in Yard related activities (see Section V) and the proposed mitigation measures (see Section VI).
d. Line haul emission estimates include both in-yard activity and by-passing through trains.

Analytical Method for Calculating Emissions

For the 2005 baseline year, emissions from the COI Yard's operational locomotives were estimated for (1) "road power" (locomotives arriving and departing from the Yard with intermodal and manifest freight trains), (2) yard switching operations, and (3) emissions from locomotive service and maintenance activities.

- 2005 Road Power Emissions – UPRR databases provided basic information on all trains arriving and departing the COI Yard during calendar year 2005. These data included the number of trains and the number of locomotives on each train. UPRR data also provided the individual locomotive model, emission control technology (as defined by EPA Tier), and whether the locomotive was equipped with automatic start/stop idle control devices.

- Emission factors for individual locomotive models and control technologies were adjusted in accordance with CARB guidance for the effects of fuel sulfur content in 2005 for both California fuel and fuel delivered in other states. These emission factors were used to calculate total emissions associated with movements into and out of the Yard based on routes followed, speeds, and throttle settings, as well as estimated idle time on arrival, and idle time prior to departure.

- 2005 Yard Switching Operations – COI Yard operations include the use of two sets of two medium horsepower SD-40 locomotives. Emissions for the 2005 baseline year were calculated based on emission factors for the specific locomotive models in use, the hours of operation, and the USEPA switcher duty cycle.

- 2005 Service and Maintenance Operations – Another UPRR database provided detailed information on the number of locomotives fueled and serviced at the COI Yard. Servicing takes place within the facility in an area referred to as the "Marne Yard" (east of South Azusa Avenue). Based on the database entries for type of service, a small number of load test events and service events requiring idling were identified, and the emissions associated with these events were calculated. The vast majority of service events were simple "yard service" involving "Direct to Locomotive" (DTL) refueling by fuel trucks with the locomotives shut down.

2007 Emission Inventory

Locomotive emissions for line-haul, service, and maintenance operations were calculated from UPRR data for calendar year 2007 in the same manner as the emissions for the 2005 baseline year. Emission factors for 2007 were updated from those for 2005 to reflect the reductions in sulfur content for both California fuel and 47-state fuel. California refinery data show that California fuel sulfur content was reduced from 221 ppm in 2005 to 4.8 ppm in 2007. EPA's 2004 forecasts for sulfur content for 47-state fuel estimated 2639 ppm S for 2005 and 1328 ppm S for 2007.

Yard switching emissions estimates were calculated based on the assumption that hp-hrs of work by switchers is proportional to the total trailing tons of originating and terminating freight, using the 2005 estimate as the baseline. Total trailing tons of freight decreased by approximately 18% from 2005 to 2007. This decrease in work and emissions is further reduced by the introduction of ultra-low emission locomotives (ULELs, i.e., gen-set switchers) in mid-2007. On average, these ULELs emit 85% less exhaust particulate matter per brake horsepower-hour, and this factor was applied for 6 months of the year's switching operations. Trailing tons of freight (and therefore, total yard switching hp-hrs of work) were assumed to increase at 1% per year after 2007.

2010-2020 Emission Inventory Forecast

UPRR locomotive acquisition and retirement projections were used to develop model- and tier-specific growth rates from 2005 to 2012.[6] These rates were applied to the observed fleet distribution at the City of Industry Yard in 2005 to generate 2012 emission factors for the City of Industry fleet. Locomotive emissions for 2010 were developed by interpolation between the City of Industry 2007 fleet's emissions and those for 2012 assuming a 1% per year growth in locomotive activity beginning in 2008. All yard switching activity after 2007 was assumed to be handled by ULEL gen-set switchers. The locomotive fleet model and technology distribution for the 2012 inventory was developed from the 2005 base year distribution and UPRR locomotive acquisition and

[6] The 2012 acquisition and retirement projections were submitted to U.S. EPA and CARB as part of the 1998 MOU reporting requirements.

retirement projections. One half of the line haul locomotives at City of Industry in 2012 were assumed to have the projected distribution. To reflect UPRR's response to the 1998 CARB MOU, the other half of the line haul fleet at City of Industry in 2012 was assumed to include equal fractions of Tier 2 Dash 9 and SD-70 locomotives. The fuel sulfur content in 2012 was projected to be 15 ppm for California fuel and 123 ppm for 47-state fuel. Emission factors for 2012 were calculated to reflect the projected fuel sulfur content for California fuel and 47-state fuel in the same manner as was used for the 2007 inventory.

Emissions estimates for 2015 and 2020 were projected from the 2012 inventory based on 1% per year growth in activity. In addition, USEPA forecasts of average line haul locomotive emissions presented in the Regulatory Impact Analysis for locomotive emission controls (EPA, 2008) and adjusted for the EPA-assumed growth rate of 1.6% per year in fuel consumption were used to derive control factors reflecting the effects of future mandated improvements in locomotive emission control technology. These control factors were applied to the line haul emissions estimates for 2010, 2015 and 2020.

2. HHD Diesel-Fueled Drayage Trucks

Table 3
Summary of Emissions from Drayage Trucks
at the UPRR City of Industry Rail Yard

Equipment Category	DPM Emissions (TPY)					
	2005[a]	2005-Adj[b]	2007	2010[c]	2015[c]	2020[c]
Traveling Emissions	1.3	1.3	1.4	0.8	0.4	0.2
Idling Emissions	0.5	0.5	0.4	0.3	0.2	0.1
Total	**1.8**	**1.8**	**1.4**	**1.0**	**0.5[d]**	**0.3**

Notes:
a. From the *Health Risk Assessment for the Union Pacific Railroad City of Industry Railyard* (CARB, 2008).
b. 2005 adjustments do not affect drayage truck emission estimates.
c. Includes growth in Yard related activities (see Section V) and the proposed mitigation measures (see Section VI).
d. The numbers shown may not add precisely due to rounding.

Analytical Method for Calculating Emissions

The 2005 baseline DPM emission estimates for drayage trucks operating at the COI Yard were based on the number of truck trips, the length of each trip, and the amount of time spent idling. Gate count data were used to determine the number of HHD trucks that operated at COI during the 2005 calendar year. UPRR personnel count the number of cargo containers processed through both the "in" and "out" gates of the Yard. Since each HHD truck holds only one cargo container, the gate counts were used to determine the number of HHD truck trips for 2005. Trucks that enter or exit the facility without a chassis and/or a cargo container are referred to as "bobtails." Based on interviews and

personal communication with the Intermodal Operations Manager at COI, the monthly gate counts were increased by 25% to account for bobtails.

The number of truck trips for calendar year 2007 was based on the actual gate count data for 2007 plus 25% to account for bobtails. For future years 2010-2020, the number of truck trips was based on the 2007 gate count data plus a growth factor of 1% per year. See Section V for a discussion on the growth rate.

In addition to the emissions from truck movements, an average idling time of 30 minutes per trip was assumed, to account for emissions during truck queuing, staging, loading, and/or unloading during the 2005 baseline year. Based on discussions with the Intermodal Operations Manager, the average queuing time at the gate at COI is less than 10 minutes per truck. In addition to idling during queuing, it was assumed that each truck idles an average of 15 minutes per trip while the chassis is connected/disconnected from the truck tractor. An additional five minutes of idling per trip was included to account for any other delays. No change in idling time per trip was assumed for calendar year 2007 or future years 2010-2020.

A fleet average emission factor for traveling exhaust emissions was calculated using CARB's EMFAC2007 model with the BURDEN output option.[7] Since the fleet distribution is not known, the EMFAC2007 default distribution for Los Angeles County was used. Idling emission factors were calculated using the EMFAC2007 model with the EMFAC output option. Separate model runs were performed for each year.

[7] Emission factors in grams per mile (g/mi) were calculated from the tons per day emissions (tpd) estimates and daily VMT estimates generated by the EMFAC2007 model (see Appendix A for model output). The tpd emission estimates were converted to g/mi as follows: g/mi = tpd x (2000 lb/ton) x (453.59 g/lb) x (1 day/(VMT x 1000)).

3. Cargo Handling Equipment (CHE)

Table 4
Summary of Emissions from Cargo Handling Equipment
at the UPRR City of Industry Rail Yard

Equipment Category	DPM Emissions (TPY)					
	2005[a]	2005-Adj[b]	2007	2010[c]	2015[c]	2020[c]
Cargo Handling Equipment[d]	2.6	1.5	1.6	0.9	0.5	0.5

Notes:

a. From the *Health Risk Assessment for the Union Pacific Railroad City of Industry Railyard* (CARB, 2008).
b. Based on new information, the emission estimates presented in the CARB HRA have been adjusted. See the Inventory Updates section above for details.
c. Includes growth in Yard-related activities (see Section V) and the proposed mitigation measures (see Section VI).
d. Emissions from cargo handling equipment were adjusted to reflect the use of a more appropriate engine load factor for yard hostlers. See Section III for a complete discussion.

Analytical Method for Calculating Emissions

The 2005 baseline year DPM emissions from CHE operating at the COI Yard were based on the number and type of equipment, equipment model year, equipment size, and the annual hours of operation. The hours of operation during the baseline year were obtained from UPRR staff. Equipment-specific emission factors were calculated using a spreadsheet developed by CARB staff and are based on the OFFROAD2007 model. As discussed above, the load factor that was used for the yard hostlers for 2005 was adjusted from the default factor of 65% from the OFFROAD model to 20% based on data collected by UPRR and BNSF.

Equipment-specific operation data were not available for calendar year 2007. Therefore, the 2007 hours of operation were assumed to be equal to the 2005 baseline year hours of operation for each equipment unit, multiplied by the ratio of the 2007 lift count to the 2005 lift count. At the end of 2005, UPRR retired two older, higher-emitting, pieces of CHE and one additional unit was removed from the Yard. The fleet makeup for the 2007 emission estimates were adjusted accordingly. In addition, in December 2006, CARB's *Regulation for Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards* (CHE Regulation) became effective and the 2005 baseline equipment-specific DPM emission factors were adjusted, as needed for future year emission calculations, to show the emission reductions that will be achieved through compliance with the CHE Regulation.

For future years 2010-2020, the 2005 baseline year hours of operation were adjusted by the ratio of the predicted future year lift count[8] to the 2005 actual lift count. The fleet mix was adjusted to account for the addition or removal of equipment. In addition, the 2005 baseline equipment-specific DPM emission factors were adjusted, as needed, to show the emission reductions that will be achieved through compliance with the CHE Regulation. It was assumed that compliance with the Regulation would be achieved through the use of verified Diesel emission control strategies (VDECS). To be conservative, it was assumed a Level 2 (50% reduction) VDECS would be used.

4. Heavy Equipment

Table 5
Summary of Emissions from Heavy Equipment
at the UPRR City of Industry Rail Yard

Equipment Category	DPM Emissions (TPY)					
	2005[a]	2005-Adj[b]	2007	2010[c]	2015[c]	2020[c]
Diesel-Fueled Heavy Equipment	0.2	0.2	0.1	0.1	0.1	0.1

Notes:
a. From the *Health Risk Assessment for the Union Pacific Railroad City of Industry Railyard* (CARB, 2008).
b. 2005 adjustments do not affect heavy equipment emission estimates.
c. Includes growth in Yard-related activities (see Section V) and the proposed mitigation measures (see Section VI).

Analytical Method for Calculating Emissions

The 2005 baseline year DPM emissions from heavy equipment operated at COI were based on the number and type of equipment, equipment model year, equipment size, fuel type, and the annual hours of operation. The hours of operation during the baseline year were obtained from UPRR staff. Equipment-specific emission factors were calculated using the OFFROAD2007 model.

Equipment-specific operational data were not available for calendar year 2007. Therefore, the 2005 baseline year hours of operation for each equipment unit were adjusted by the ratio of the 2007 lift count to the 2005 lift count. The fleet mix was adjusted, as needed, to account for equipment being added or removed from the fleet.

All Diesel-fueled heavy equipment operated at intermodal rail yards must comply with the CHE Regulation. Therefore, the 2005 baseline equipment-specific DPM emission

[8] See Section V for a discussion of the projected growth rates for the facility. Predicted lift counts are shown in Appendix B.

factors for the UPRR owned equipment were adjusted, as needed, to show the emission reductions that will be achieved through compliance with the CHE Regulation. It should be noted that much of the heavy equipment operated at the COI Yard is not owned by UPRR. While this equipment is required to comply with the provisions of the CHE Regulation, UPRR cannot predict the methods that will be used by the various contractors for compliance nor the compliance schedule for each contractor. Therefore, no adjustments were made to the equipment specific emission factors for the contractor-owned equipment.

For future years 2010–2020, the 2005 baseline year hours of operation were adjusted by the ratio of the predicted future year lift count to the 2005 actual lift count. The 2005 baseline equipment-specific DPM emission factors for UPRR owned equipment were adjusted, as needed, to reflect the emission reductions that will be achieved through compliance with the CHE Regulation. It was assumed that compliance with the CHE Regulation will be achieved through the use of a VDECS. To be conservative, it was assumed a Level 2 (50% reduction) VDECS would be used. As noted above, the emission factors for contractor-owned heavy equipment were not adjusted.

5. Transport Refrigeration Units (TRUs) and Refrigerated Railcars (Reefer Cars)

Table 6
Summary of Emissions from TRUs and Reefer Cars
at the UPRR City of Industry Rail Yard

Equipment Category	DPM Emissions (TPY)					
	2005[a]	2005-Adj[b]	2007	2010[c]	2015[c]	2020[c]
TRUs	0.2	0.2	0.2	0.1	0.01	0.01
Reefer Cars	0.1	0.1	0.1	0.03	0.003	0.003
Total	**0.3**	**0.3**	**0.3**	**0.1**	**0.01**	**0.01**

Notes:
a. From the *Health Risk Assessment for the Union Pacific Railroad City of Industry Railyard* (CARB, 2008).
b. 2005 adjustments do not affect TRU and reefer car emission estimates.
c. Includes growth in Yard-related activities (see Section V) and the proposed mitigation measures (see Section VI).

Analytical Method for Calculating Emissions

The 2005 baseline year emissions from TRUs and reefer cars are based on the average size of the units, the average number of units in the Yard, and the hours of operation for each unit. The hours of operation were from CARB's *Staff Report: Initial Statement of Reason for Proposed Rulemaking for Airborne Toxic Control Measure (ATCM) for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets, and*

Facilities Where TRUs Operate (October 2003).[9] It is assumed the number of units and the annual hours of operation remain constant over the course of each year, with individual units cycling in and out of the Yard. Emission factors for TRUs and reefer cars were obtained from the OFFROAD2007 model.

For the 2007 calendar year and 2010-2020 future year emission estimates, the average number of units in the Yard was calculated by multiplying the 2005 equipment count data by the ratio of the predicted future year lift count to the 2005 lift count. The 2005 baseline year DPM emission factors were adjusted, as needed, to show the emission reductions that will be achieved through compliance with the TRU ATCM. UPRR does not own or operate the TRUs that pass through the COI Yard. Therefore, specifics on how units will comply with the ATCM were not available. For the purposes of this Plan, it is assumed that all TRUs operating in the Yard will comply with the emission levels contained in the ATCM by the compliance deadline.

6. Other Miscellaneous Diesel-Fueled Equipment

Table 7
Summary of Emissions from Light Duty Yard Trucks
at the UPRR City of Industry Rail Yard

Equipment Category	DPM Emissions (TPY)					
	2005[a]	2005-Adj[b]	2007	2010[c]	2015[c]	2020[c]
Light Duty Yard Trucks	0.2	0.2	0.2	0.2	0.3	0.3
Stationary/Portable Engines	0.003	0.003	0.003	0.003	0.003	0.003
Total	**0.2**	**0.2**	**0.2**	**0.2**	**0.3**	**0.3**

Notes:
a. From the *Health Risk Assessment for the Union Pacific Railroad City of Industry Railyard* (CARB, 2008).
b. 2005 adjustments do not affect these emission estimates.
c. Includes growth in Yard-related activities (see Section V) and the proposed mitigation measures (see Section VI).

Analytical Method for Calculating Emissions

Light-Duty Trucks – Emissions from light-duty Diesel-fueled trucks operating at the Yard are based on the engine model year, vehicle class, annual vehicle miles traveled (VMT), and the amount of time spent idling. Vehicle-specific emission factors for travel exhaust and idling were calculated using the EMFAC2007 model.

[9] Available at *http://www.arb.ca.gov/regact/trude03/trude03.htm*.

For calendar years 2007 and 2010-2020, emission factors were calculated using the EMFAC2007 model. It is assumed that the fleet mix and activity data were unchanged from the 2005 baseline year.

Stationary and Portable Internal Combustion Engines – Emissions from the stationary emergency generator and portable air compressor (contractor-owned and -operated) were calculated based on the size of the engine and the annual hours of operation. Emission factors for the stationary engine were taken from AP-42, Table 3-3.1 and emission factors for the portable air compressor were calculated using the OFFROAD2007 model. Since the operation of these units is not directly related to the volume of freight handled, emission estimates for calendar years 2007 and 2010-2020 were assumed to be unchanged from the 2005 baseline year.

V. Projected Growth Rates

The emission estimates presented in Table 1 account for the expected growth in operations at UPRR's California facilities. While it is not possible to accurately predict future goods movements needs, a reasonable estimate of growth was determined based on historic data. Based on a review of historic fuel use data and other historic operational factors, such as lift counts, tons of freight, etc., and discussions with CARB staff, it was determined that a long-term growth rate of 1% per year is appropriate for the COI Yard. Detailed data, including Diesel fuel consumption, revenue ton-miles of freight, and gross ton-miles of freight, are contained in Appendix B.

VI. Mitigation Measures

1. Current Mitigation Measures

As shown in Table 1, by 2007, emissions of DPM have been reduced 10% from the 2005 baseline year. These reductions were achieved through the implementation of the measures listed below.

- Retrofit of idle control devices – By the end of 2007, 96% of UPRR's intrastate locomotives had been equipped with idle control devices. By June 2008, 100% of UPRR's intrastate locomotives are equipped with idle control devices.

- Use of idle control devices on new locomotives – All new locomotives purchased since 2001 are equipped with factory-installed automatic idle control devices.

- Increased fuel efficiency – Aggressive fuel consumption efforts have achieved a 12% improvement in fuel efficiency since 1995.

- Cleaner new line haul locomotives – UPRR has acquired more than 800 new, cleaner Tier 2 line haul locomotives since they were introduced in 2005.

- Cleaner existing line haul locomotives – UPRR has remanufactured more than 1,800 older line haul locomotives with new, lower emitting components since 2000.

- Cleaner fuels – Only Ultra-Low Sulfur Diesel (ULSD) fuel is being dispensed in California.

- Cleaner cargo handling equipment – Since 2005, UPRR has retired four pieces of higher-emitting CHE and two additional units will be retired in 2008. Two new rubber tire gantry (RTG) cranes, equipped with the cleanest engines available, have been purchased for the Yard. In addition, a VDECS will be installed on each new RTG unit during 2009. The installation of the VDECS will further reduce the DPM emissions from these units.

- Employee training – Aggressive employee training is being implemented to reduce unnecessary idling and ensure trains are operated in the most efficient manner by the locomotive engineers, thereby reducing fuel consumption and emissions.

2. Proposed Future Mitigation Measures

To achieve additional DPM reductions, UPRR proposes to implement the mitigation measures outlined below.

- Continued acquisition of Tier 2 line haul locomotives and newer technology locomotives as they become available.

- Continued remanufacture and retrofit of older line haul locomotives with new, lower-emitting components and automatic idle controls.

- Continued retirement of older locomotives from the fleet.

- Continued reductions in unnecessary locomotive and equipment idling through employee training.

- Continued modernization of CHE – By the end 2010, all of the 1988-2006 model year CHE that is currently operating at the COI Yard (a total of 7 units) will be in compliance with the CHE Regulation. All new units purchased for the Yard will be equipped with either an engine certified to the Tier 4 standards or an engine certified to the highest available Tier combined with a VDECS.

- Cleaner drayage fleet – Natural fleet turn-over coupled with the Port's Clean Truck Program and CARB's proposed drayage truck regulation will continue to reduce DPM emissions from these vehicles.

- Cleaner TRUs – Beginning in 2008, TRUs will be required to meet lower emission standards contained in the ATCM. The standards are further reduced beginning in 2010.

VII. Evaluation of Additional Mitigation Measures

In addition to the proposed mitigation measures discussed above, UPRR will evaluate the use of other mitigation measures, on a case-by-case basis. Measures that are found to be safe, legal, technologically and operationally feasible, and cost-effective will be further evaluated for implementation.

VIII. Mechanisms for Tracking Progress

UPRR will track the progress and effectiveness of the mitigation measures using a variety of methods. Mechanisms for tracking progress could include, but are not limited to, the following:

- Recordkeeping – The CHE Regulation requires detailed recordkeeping and reporting for all CHE fleets. These records can be used to determine when higher-emitting equipment is replaced by newer, cleaner technology and/or when a VDECS has been installed.

  In addition, UPRR maintains detailed records of Diesel fuel usage. A reduction in the amount of fuel used corresponds to a reduction in emissions.

- Compliance with Regulations – By maintaining compliance with current and proposed regulations, such as the CHE Regulation, UPRR will be able to demonstrate a reduction in DPM emissions at the COI Yard.

- Compliance with Other Agreements – By demonstrating compliance with the 1998 MOU, which requires locomotives operating in the South Coast Air Basin to meet a Tier 2 equivalent, emission reductions at the COI Yard can be shown.

- Inventory Updates – Periodic updates to the emission inventory can be used to demonstrate actual emission reductions achieved at the COI Yard. Due to the time and data required to prepare a complete rail yard inventory, UPRR is proposing to prepare inventory updates no more frequently than once every two years.

IX. Conclusions

As shown in Table 1, the proposed mitigation measures, when fully implemented, will reduce the DPM emissions from the COI Yard by approximately 76% from 2005 levels. These emission reductions will concurrently lower any existing predicted health risk associated with the facility operations. Other federal, state, and related air pollution control measures and plans will supplement the current and future emission reduction discussed in this Plan.

X. References

CARB, 2008. *Health Risk Assessment for the Union Pacific Railroad City of Industry Rail Yard.* (*http://www.arb.ca.gov/railyard/hra/up_coi_hra.pdf.*)

EPA, 2008. *Regulatory Impact Analysis: Control of Emissions of Air Pollution from Locomotive Engines and Marine Compression-Ignition Engines Less than 30 Liters per Cylinder*, EPA420-R-08-001a, USEPA-OTAQ, May 2008.

Sierra Research, 2007. *Toxic Air Contaminant Emission Inventory and Dispersion Modeling Report for the City of Industry Rail Yard, City of Industry, California.* (Available at *http://www.arb.ca.gov/railyard/hra/sr_ind_rpt.pdf.*)

APPENDIX A
DETAILED EMISSION CALCULATIONS

LOCOMOTIVE DATA

City of Industry Locomotive Emissions (DPM TPY)

	2005*	2007*	2010**	2015**	2020**
Line Haul	2.6	2.6	2.1	1.5	1.1
Switch	3.3	1.5	0.4	0.4	0.5
Service and load tests	0.01	0.01	0.01	0.00	0.00
Total	**5.9**	**4.1**	**2.5**	**1.9**	**1.5**

* Actual

** Forecast assuming 1% p.a. growth after 2007, UPRR-projected fleet turnover, and new EPA emission standards.

Emission Calculations

Initial calculations:
2005 and 2007 from actual data
2012 based on 2005 activity and projected 2012 fleet composition without EPA (2004) controls

	2005	2007	2012 fleet @ '05 activity
Through trains and power	0.51	0.95	0.40
Freight and power in yard	2.06	1.61	1.92
Yardops	3.29	1.54	0.49
Service and load tests	0.008	0.010	0.005
Total	5.88	4.11	2.81

Growth factor calculations	
2007 observed growth v. 2005	0.816
Annual growth after 2007	1.01
Growth factors	
2012 relative to 2005	0.857
2015 relative to 2012	1.030
2020 relative to 2012	1.083

Projected and interpolated emissions with growth, but without EPA (2004) controls

	2005	2007	2010	2012
Through trains and power	0.51	0.95	0.52	0.34
Freight and power in yard	2.06	1.61	1.63	1.64
Yardops	3.29	1.54	0.41	0.42
Service and load tests	0.008	0.010	0.006	0.004
Total	5.88	4.11	2.57	2.41

Control factor calculations from EPA 2008 Final RIA (Tables 3-72 and 3-82)

	2010 Base	2010 Control	2012 Base	2012 Control	2015 Control	2020 Control
EPA Line Haul Emissions	22300	21580	21956	19597	16928	12550

(assumes 1.6%/year growth in fuel use)
(no further control for switchers assumed beyond ULEL replacement in 2007)

Control factors (2015 and 2020 calculated relative to 2012 fleet)

	2010	2012	2015	2020
Line Haul Control Factor	0.968	0.893	0.824	0.564

RESULTS:
Projected and interpolated emissions with growth and control

	2005	2007	2010	2012	2015	2020
Through trains and power	0.51	0.95	0.50	0.31	0.26	0.19
Freight and power in yard	2.06	1.61	1.58	1.47	1.24	0.90
Yardops	3.29	1.54	0.41	0.42	0.43	0.46
Service and load tests	0.008	0.010	0.006	0.004	0.003	0.002
Total	5.88	4.11	2.50	2.20	1.94	1.54

LOCOMOTIVE DATA
2007 SAMPLE CALCULATIONS

Activity Types

Description	Activity Code	Number of Events/Year	Locomotives per Consist	Number of Setouts	Emission Factor Group	Locomotives per Consist Working	Fraction of Calif. Fuel
EB Through (Alhambra Sub) without Setouts	1	376	3.572	301	1	3.572	0.5
EB Through (Alhambra Sub) with Setouts	2	376	3.572	301	1	3.572	0.5
WB Through (Alhambra Sub) without Setouts	3	3686	3.280	1061	1	3.280	0.5
WB Through (Alhambra Sub) with Setouts	4	3686	3.280	1061	1	3.280	0.5
EB Through (Los Angeles Sub) without Setouts	5	10	2.900	3	1	2.900	0.5
EB Through (Los Angeles Sub) with Setouts	6	10	2.900	3	1	2.900	0.5
WB Through (Los Angeles Sub) without Setouts	7	22	3.727	14	1	3.727	0.5
WB Through (Los Angeles Sub) with Setouts	8	22	3.727	14	1	3.727	0.5
EB Intermodal Terminating	9	43	2.395	1	2	2.395	0.0
EB Intermodal Originating	10	797	2.837	1	2	2.837	0.9
WB Intermodal Terminating	11	346	2.387	0	2	2.387	0.0
WB Intermodal Originating	12	36	1.500	0	2	1.500	0.9
EB Manifest Terminating	13	5	2.000	0	3	2.000	0.0
EB Manifest Originating	14	14	2.714	0	3	2.714	0.9
WB Manifest Terminating	15	31	3.871	0	3	3.871	0.0
WB Manifest Originating	16	16	3.438	0	3	3.438	0.9
EB West Colton Manifest Terminating	17	0	2.000	0	4	1.000	0.9
EB West Colton Manifest Originating	18	353	3.320	0	4	3.320	0.9
WB West Colton Manifest Terminating	19	362	3.210	0	4	3.210	0.9
WB West Colton Manifest Originating	20	0	2.000	0	4	2.000	0.9
EB Local Terminating (Alhambra Sub)	21	482	1.965	0	5	1.965	1.0
EB Local Originating (Alhambra Sub)	22	505	1.972	0	5	1.972	1.0
WB Local Terminating (Alhambra Sub)	23	235	1.991	0	5	1.991	1.0
WB Local Originating (Alhambra Sub)	24	244	2.000	0	5	2.000	1.0
EB Local Terminating (Los Angeles Sub)	25	159	2.050	0	5	2.050	1.0
EB Local Originating (Los Angeles Sub)	26	252	2.048	0	5	2.048	1.0
WB Local Terminating (Los Angeles Sub)	27	398	1.892	0	5	1.892	1.0
WB Local Originating (Los Angeles Sub)	28	550	1.915	0	5	1.915	1.0
EB Power Moves Through (Alhambra Sub) without Setouts	29	7	1.714	0	1	1.500	0.5
EB Power Moves Through (Alhambra Sub) with Setouts	30	7	1.714	0	1	1.500	0.5
WB Power Moves Through (Alhambra Sub) without Setouts	31	107	3.916	5	1	1.500	0.5
WB Power Moves Through (Alhambra Sub) with Setouts	32	107	3.916	5	1	1.500	0.5
EB Power Moves Through (Los Angeles Sub)	33	50	3.340	0	1	1.500	0.5
WB Power Moves Through (Los Angeles Sub)	35	126	3.381	0	1	1.500	0.5
EB Power Moves Terminating	37	296	2.865	0	6	1.500	0.0
EB Power Moves Originating	38	35	3.029	0	6	1.500	0.9
WB Power Moves Terminating	39	618	3.158	0	6	1.500	0.0
WB Power Moves Originating	40	234	3.308	0	6	1.500	0.9
Yard Operations (Hours)	41	7360	2.000	0	7	2.000	1.0

		Emission Factors Weighted by Model/Tier/ZTR Fractions - DPM g/hr per Locomotive										
Consist Groups	**Group ID**	**Idle-NonZTR**	**Idle-All**	**DB**	**N1**	**N2**	**N3**	**N4**	**N5**	**N6**	**N7**	**N8**
California Fuel (221 ppm S)												
Through Trains and Power Moves	1	12.83	24.62	41.99	43.41	96.14	223.06	284.60	357.90	575.10	684.51	764.71
Intermodal Trains	2	11.93	23.20	41.75	45.72	97.17	223.96	288.34	361.42	563.43	664.86	742.13
Manifest Trains	3	31.10	35.61	65.08	43.33	117.86	226.61	263.70	335.16	518.43	647.19	787.85
West Colton Manifest Trains	4	26.57	34.11	65.16	42.05	118.25	237.83	266.66	332.51	534.16	690.53	817.49
Local Trains	5	30.84	38.87	72.68	31.50	112.16	176.86	189.68	233.23	376.96	436.19	569.83
In-Yard Power Moves	6	28.47	34.14	61.13	41.43	110.56	217.91	257.97	328.88	520.33	641.63	769.32
Yard Switching	7	47.94	47.94	80.04	35.70	134.30	210.81	226.28	286.07	483.62	579.93	744.38
47-State Fuel (2639 ppm S)												
Through Trains and Power Moves	1	12.83	24.62	41.99	43.41	96.14	232.69	302.21	383.84	612.51	724.61	811.27
Intermodal Trains	2	11.93	23.20	41.75	45.72	97.17	234.50	306.08	387.04	600.68	707.57	792.15
Manifest Trains	3	31.10	35.61	65.08	43.33	117.86	235.82	280.07	359.87	551.83	682.92	832.16
West Colton Manifest Trains	4	26.57	34.11	65.16	42.05	118.25	246.35	283.35	357.65	567.94	724.36	858.48
Local Trains	5	30.84	38.87	72.68	31.50	112.16	182.65	201.61	251.21	400.47	455.74	595.91
In-Yard Power Moves	6	28.47	34.14	61.13	41.43	110.56	226.57	274.02	353.18	553.78	676.48	812.13
Yard Switching	7	N/A -- Hump and trim sets operate on 100% California Fuel										

Note: Idle-NonZTR is the average per-locomotive idle emission rate for the fraction of locomotives not equipped with ZTR/Auto start-stop technology

Locomotive Model Distributions
Through Trains and Power Moves

Technology	**ZTR/AESS**	**Switcher**	**GP-3x**	**GP-4x**	**SD-50**	**GP-60**	**SD-7x**	**SD-90**	**Dash 7**	**Dash 8**	**Dash 9**	**C-60**
Pre Tier 0	**No**	0.0000	0.0040	0.0690	0.0013	0.0472	0.0018	0.0003	0.0000	0.0082	0.0230	0.0000
Pre Tier 0	**Yes**	0.0000	0.0042	0.0000	0.0000	0.0005	0.0000	0.0000	0.0000	0.0000	0.0072	0.0000
Tier 0	**No**	0.0000	0.0000	0.0048	0.0000	0.0418	0.2532	0.0003	0.0000	0.0053	0.0241	0.0000
Tier 0	**Yes**	0.0000	0.0005	0.0004	0.0000	0.0004	0.0017	0.0000	0.0000	0.0000	0.0042	0.0000
Tier 1	**No**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0018	0.0000	0.0000	0.0000	0.0001	0.0000
Tier 1	**Yes**	0.0000	0.0000	0.0000	0.0000	0.0000	0.2436	0.0000	0.0000	0.0000	0.0006	0.0000
Tier 2	**No**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0010	0.0000
Tier 2	**Yes**	0.0000	0.0000	0.0013	0.0000	0.0000	0.1235	0.0000	0.0000	0.0000	0.1249	0.0000

Intermodal Trains

Technology	ZTR/AESS	Switcher	GP-3x	GP-4x	SD-50	GP-60	SD-7x	SD-90	Dash 7	Dash 8	Dash 9	C-60
Pre Tier 0	No	0.0000	0.0000	0.0439	0.0019	0.0340	0.0025	0.0003	0.0000	0.0186	0.0371	0.0000
Pre Tier 0	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0102	0.0000
Tier 0	No	0.0000	0.0000	0.0025	0.0000	0.0362	0.2569	0.0009	0.0000	0.0108	0.0278	0.0003
Tier 0	Yes	0.0000	0.0000	0.0000	0.0000	0.0016	0.0019	0.0000	0.0000	0.0000	0.0056	0.0000
Tier 1	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0022	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.2284	0.0000	0.0000	0.0000	0.0003	0.0000
Tier 2	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0009	0.0000
Tier 2	Yes	0.0000	0.0000	0.0006	0.0000	0.0000	0.1122	0.0000	0.0000	0.0000	0.1626	0.0000

Manifest Trains

Technology	ZTR/AESS	Switcher	GP-3x	GP-4x	SD-50	GP-60	SD-7x	SD-90	Dash 7	Dash 8	Dash 9	C-60
Pre Tier 0	No	0.0000	0.0000	0.3665	0.0136	0.1177	0.0000	0.0091	0.0000	0.0136	0.0000	0.0000
Pre Tier 0	Yes	0.0000	0.0045	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 0	No	0.0000	0.0000	0.0362	0.0000	0.1403	0.0498	0.0000	0.0000	0.0181	0.0091	0.0000
Tier 0	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0724	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 2	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 2	Yes	0.0000	0.0000	0.0136	0.0000	0.0000	0.0317	0.0000	0.0000	0.0000	0.1041	0.0000

West Colton Manifest Trains

Technology	ZTR/AESS	Switcher	GP-3x	GP-4x	SD-50	GP-60	SD-7x	SD-90	Dash 7	Dash 8	Dash 9	C-60
Pre Tier 0	No	0.0004	0.0155	0.1630	0.0000	0.2655	0.0000	0.0000	0.0000	0.0040	0.0044	0.0000
Pre Tier 0	Yes	0.0004	0.0049	0.0004	0.0000	0.0004	0.0000	0.0000	0.0000	0.0000	0.0022	0.0000
Tier 0	No	0.0000	0.0000	0.0133	0.0000	0.1798	0.0222	0.0000	0.0000	0.0013	0.0044	0.0000
Tier 0	Yes	0.0000	0.0040	0.0000	0.0000	0.0093	0.0000	0.0000	0.0000	0.0000	0.0009	0.0000
Tier 1	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0320	0.0000	0.0000	0.0000	0.0013	0.0000
Tier 2	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 2	Yes	0.0000	0.0000	0.0013	0.0000	0.0000	0.2251	0.0000	0.0000	0.0000	0.0435	0.0000

Local Trains

Technology	ZTR/AESS	Switcher	GP-3x	GP-4x	SD-50	GP-60	SD-7x	SD-90	Dash 7	Dash 8	Dash 9	C-60
Pre Tier 0	No	0.0000	0.7082	0.0617	0.0000	0.0009	0.0000	0.0000	0.0000	0.0006	0.0000	0.0000
Pre Tier 0	Yes	0.0000	0.1969	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 0	No	0.0000	0.0000	0.0182	0.0000	0.0012	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 0	Yes	0.0000	0.0000	0.0109	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 2	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 2	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0000

In-Yard Power Moves

Technology	ZTR/AESS	Switcher	GP-3x	GP-4x	SD-50	GP-60	SD-7x	SD-90	Dash 7	Dash 8	Dash 9	C-60
Pre Tier 0	**No**	0.0003	0.0943	0.2725	0.0059	0.0972	0.0015	0.0012	0.0000	0.0186	0.0136	0.0000
Pre Tier 0	**Yes**	0.0000	0.0242	0.0000	0.0000	0.0006	0.0000	0.0000	0.0000	0.0000	0.0053	0.0000
Tier 0	**No**	0.0000	0.0000	0.0171	0.0000	0.1149	0.1017	0.0003	0.0000	0.0097	0.0153	0.0003
Tier 0	**Yes**	0.0000	0.0003	0.0006	0.0000	0.0006	0.0006	0.0000	0.0000	0.0000	0.0024	0.0000
Tier 1	**No**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0012	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	**Yes**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0884	0.0000	0.0000	0.0000	0.0012	0.0000
Tier 2	**No**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0006	0.0000
Tier 2	**Yes**	0.0000	0.0000	0.0085	0.0000	0.0000	0.0374	0.0000	0.0000	0.0000	0.0639	0.0000

Yard Switching*

Technology	ZTR/AESS	Switcher	GP-3x	GP-4x	SD-50	GP-60	SD-7x	SD-90	Dash 7	Dash 8	Dash 9	C-60
Pre Tier 0	**No**	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pre Tier 0	**Yes**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 0	**No**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 0	**Yes**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	**No**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	**Yes**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 2	**No**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 2	**Yes**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

*** Yard switching emissions calculated as SD-40 emissions with 85% control factor for ULEL gensets from mid-2007.**

Track Segment	Segment Number	Length (mi)
Los Angeles Sub West End	1	0.2651
Los Angeles Sub #2	2	0.1754
Los Angeles Sub Lead #1	3	0.0537
Los Angeles Sub Lead #2	4	0.0436
Los Angeles Sub Lead #3	5	0.0248
Los Angeles Sub Lead #4	6	0.0329
East Bowl to Mid Yard	13	0.2799
Mid Yard to West Marne	14	0.2851
Marne North Track	15	0.2851
East Marne to Fullerton	16	0.6980
West Marne to Marne South Track	17	0.1554
Marne South Track	18	0.2811
Marne South Track to East Marne	19	0.1401
Alhambra Sub West End	20	0.1863
Alhambra Sub #2	21	0.1863
Alhambra Sub #3	22	0.2530
Alhambra Sub #4	23	0.2207
Alhambra Sub #5	24	0.2702
Alhambra Sub #6	25	0.7284
Alhambra Sub #7	26	0.5547
Alhambra Sub #8	27	0.6778
Alhambra Sub Lead #1	28	0.1977
Alhambra Sub Lead #2	29	0.1164
A Yard West End	30	0.1584
A Yard West Middle	31	0.3410
A Yard East Middle	32	0.3275
Bowl West End	33	0.1715
Bowl Middle	34	0.4917
Bowl East End	35	0.2016
Los Angeles Sub Lead #7	40	0.0639
Los Angeles Sub Lead #8	41	0.0617
Los Angeles Sub Lead #9	42	0.0552
Los Angeles Sub Lead #5	43	0.0286
Los Angeles Sub Lead #6	44	0.0581
Los Angeles Sub #3	45	1.4558
Azusa Yard	46	0.3568
A Yard Switching	47	0.7644
Intermodal Track and Bowl Yard Switching	48	0.7446
Switching between A Yard/Bowl and Marne	49	0.3618
Marne Yard Switching	50	0.5270

Movement Type	Activity Code	Segment Number	Speed (mph)	Duty Cycle Number	Non-ZTR Idle Time (hrs)	ZTR Idle Time (hrs)	Working Time - Final Train Building (hrs)	Fraction of Segment or Time Moving
EB Through (Alhambra Sub) without Setouts	1	20	50	1	0.000	0.000	0.000	1.000
"	1	21	50	1	0.000	0.000	0.000	1.000
"	1	22	50	1	0.000	0.000	0.000	1.000
"	1	23	50	1	0.000	0.000	0.000	1.000
"	1	24	50	1	0.000	0.000	0.000	1.000
"	1	25	50	1	0.000	0.000	0.000	1.000
"	1	26	50	1	0.000	0.000	0.000	1.000
"	1	27	50	1	0.000	0.000	0.000	1.000
EB Through (Alhambra Sub) with Setouts	2	20	30	2	0.000	0.000	0.000	1.000
"	2	21	20	3	0.000	0.000	0.000	1.000
"	2	28	10	4	0.000	0.000	0.000	1.000
"	2	29	10	4	0.000	0.000	0.000	1.000
"	2	30	10	4	0.000	0.000	0.000	1.000
"	2	31	10	4	0.500	0.000	0.000	1.000
"	2	32	10	4	0.000	0.000	0.000	1.000
"	2	13	10	4	0.000	0.000	0.000	1.000
"	2	14	10	4	0.000	0.000	0.000	1.000
"	2	15	10	4	0.000	0.000	0.000	1.000
"	2	16	10	4	0.000	0.000	0.000	1.000
WB Through (Alhambra Sub) without Setouts	3	20	50	1	0.000	0.000	0.000	1.000
"	3	21	50	1	0.000	0.000	0.000	1.000
"	3	22	50	1	0.000	0.000	0.000	1.000
"	3	23	50	1	0.000	0.000	0.000	1.000
"	3	24	50	1	0.000	0.000	0.000	1.000
"	3	25	50	1	0.000	0.000	0.000	1.000
"	3	26	50	1	0.000	0.000	0.000	1.000
"	3	27	50	1	0.000	0.000	0.000	1.000
WB Through (Alhambra Sub) with Setouts	4	20	30	2	0.000	0.000	0.000	1.000
"	4	21	20	3	0.000	0.000	0.000	1.000
"	4	28	10	4	0.000	0.000	0.000	1.000
"	4	29	10	4	0.000	0.000	0.000	1.000
"	4	30	10	4	0.000	0.000	0.000	1.000
"	4	31	10	4	0.500	0.000	0.000	1.000
"	4	32	10	4	0.000	0.000	0.000	1.000
"	4	13	10	4	0.000	0.000	0.000	1.000
"	4	14	10	4	0.000	0.000	0.000	1.000
"	4	15	10	4	0.000	0.000	0.000	1.000
"	4	16	10	4	0.000	0.000	0.000	1.000
EB Through (Los Angeles Sub) without Setouts	5	1	50	1	0.000	0.000	0.000	1.000
"	5	2	50	1	0.000	0.000	0.000	1.000
"	5	45	50	1	0.000	0.000	0.000	1.000
"	5	46	50	1	0.000	0.000	0.000	1.000
EB Through (Los Angeles Sub) with Setouts	6	1	50	1	0.000	0.000	0.000	1.000
"	6	2	30	2	0.000	0.000	0.000	1.000
"	6	45	20	3	0.000	0.000	0.000	1.000
"	6	46	10	4	0.000	0.500	0.000	1.000
WB Through (Los Angeles Sub) without Setouts	7	1	50	1	0.000	0.000	0.000	1.000
"	7	2	50	1	0.000	0.000	0.000	1.000
"	7	45	50	1	0.000	0.000	0.000	1.000
"	7	46	50	1	0.000	0.000	0.000	1.000
WB Through (Los Angeles Sub) with Setouts	8	1	50	1	0.000	0.000	0.000	1.000
"	8	2	30	2	0.000	0.000	0.000	1.000
"	8	45	20	3	0.000	0.000	0.000	1.000
"	8	46	10	4	0.000	0.500	0.000	1.000
EB Intermodal Terminating	9	20	30	2	0.000	0.000	0.000	1.000
"	9	21	20	3	0.000	0.000	0.000	1.000
"	9	28	10	4	0.000	0.000	0.000	1.000
"	9	29	10	4	0.000	0.000	0.000	1.000
"	9	30	10	4	0.000	0.000	0.000	1.000
"	9	31	10	4	0.000	0.000	0.000	1.000
"	9	32	10	4	0.000	0.000	0.000	1.000
"	9	13	10	4	0.000	0.000	0.000	1.000
"	9	14	10	4	0.000	0.000	0.000	1.000
"	9	14	10	4	0.000	0.000	0.000	1.000
"	9	13	10	4	0.000	0.000	0.000	1.000
"	9	32	10	4	0.500	0.500	0.000	0.500
"	9	-32	10	4	0.000	0.000	0.000	0.500
"	9	-13	10	4	0.000	0.000	0.000	1.000

Movement Type	Activity Code	Segment Number	Speed (mph)	Duty Cycle Number	Non-ZTR Idle Time (hrs)	ZTR Idle Time (hrs)	Working Time - Final Train Building (hrs)	Fraction of Segment or Time Moving
"	9	-17	10	4	0.000	0.000	0.000	1.000
"	9	-18	10	4	0.000	0.000	0.000	0.500
EB Intermodal Originating	10	18	10	5	0.000	0.000	1.500	0.000
"	10	-17	10	4	0.000	0.000	0.000	0.500
"	10	-13	10	4	0.000	0.000	0.000	0.500
"	10	-32	10	4	0.000	0.000	0.000	0.250
"	10	32	10	5	0.000	0.000	0.250	0.000
"	10	13	10	5	0.000	0.000	0.250	0.000
"	10	14	10	5	0.000	0.000	0.250	0.000
"	10	15	10	4	0.000	0.000	0.000	0.500
"	10	16	10	4	0.000	0.000	0.000	0.500
"	10	-19	10	4	0.000	0.000	0.000	0.500
"	10	-19	10	4	0.000	0.000	0.000	0.250
"	10	19	10	5	0.000	0.000	0.100	0.000
"	10	16	10	5	0.000	0.000	0.650	0.000
WB Intermodal Terminating	11	16	10	4	0.000	0.000	0.000	1.000
"	11	15	10	4	0.000	0.000	0.000	1.000
"	11	14	10	4	0.000	0.000	0.000	1.000
"	11	13	10	4	0.000	0.000	0.000	1.000
"	11	32	10	4	0.000	0.000	0.000	1.000
"	11	31	10	4	0.000	0.000	0.000	1.000
"	11	30	10	4	0.000	0.000	0.000	1.000
"	11	29	10	4	0.000	0.000	0.000	1.000
"	11	28	10	4	0.000	0.000	0.000	1.000
"	11	21	10	4	0.000	0.000	0.000	1.000
"	11	21	10	4	0.000	0.000	0.000	1.000
"	11	28	10	4	0.000	0.000	0.000	1.000
"	11	29	10	4	0.000	0.000	0.000	1.000
"	11	33	10	4	0.500	0.500	0.000	0.500
"	11	-33	10	4	0.000	0.000	0.000	0.500
"	11	-29	10	4	0.000	0.000	0.000	1.000
"	11	-30	10	4	0.000	0.000	0.000	1.000
"	11	-31	10	4	0.000	0.000	0.000	1.000
"	11	-32	10	4	0.000	0.000	0.000	1.000
"	11	-13	10	4	0.000	0.000	0.000	1.000
"	11	-17	10	4	0.000	0.000	0.000	1.000
"	11	-18	10	4	0.000	0.000	0.000	0.500
WB Intermodal Originating	12	18	10	5	0.000	0.000	1.500	0.000
"	12	-17	10	4	0.000	0.000	0.000	0.500
"	12	-13	10	4	0.000	0.000	0.000	0.500
"	12	-32	10	4	0.000	0.000	0.000	0.500
"	12	-31	10	4	0.000	0.000	0.000	0.500
"	12	-30	10	4	0.000	0.000	0.000	0.500
"	12	30	10	5	0.000	0.000	0.150	0.000
"	12	29	10	5	0.000	0.000	0.200	0.000
"	12	28	10	5	0.000	0.000	0.200	0.000
"	12	21	10	5	0.000	0.000	0.200	0.000
"	12	20	10	4	0.000	0.000	0.000	0.500
"	12	-17	10	4	0.000	0.000	0.000	0.500
"	12	17	10	5	0.000	0.000	0.150	0.000
"	12	13	10	5	0.000	0.000	0.200	0.000
"	12	32	10	5	0.000	0.000	0.200	0.000
"	12	31	10	5	0.000	0.000	0.200	0.000
"	12	30	10	4	0.000	0.000	0.000	0.500
"	12	29	10	4	0.000	0.000	0.000	0.500
"	12	28	10	4	0.000	0.000	0.000	0.500
"	12	21	10	4	0.000	0.000	0.000	0.500
"	12	20	10	4	0.000	0.000	0.000	0.500
EB Manifest Terminating	13	20	30	2	0.000	0.000	0.000	1.000
"	13	21	20	3	0.000	0.000	0.000	1.000
"	13	28	10	4	0.000	0.000	0.000	1.000
"	13	29	10	4	0.000	0.000	0.000	1.000
"	13	30	10	4	0.000	0.000	0.000	1.000
"	13	31	10	4	0.000	0.000	0.000	1.000
"	13	32	10	4	0.000	0.000	0.000	1.000
"	13	13	10	4	0.000	0.000	0.000	1.000
"	13	14	10	4	0.000	0.000	0.000	1.000
"	13	14	10	4	0.000	0.000	0.000	1.000
"	13	13	10	4	0.000	0.000	0.000	1.000

Movement Type	Activity Code	Segment Number	Speed (mph)	Duty Cycle Number	Non-ZTR Idle Time (hrs)	ZTR Idle Time (hrs)	Working Time - Final Train Building (hrs)	Fraction of Segment or Time Moving
"	13	32	10	4	0.500	0.500	0.000	0.500
"	13	-32	10	4	0.000	0.000	0.000	0.500
"	13	-13	10	4	0.000	0.000	0.000	1.000
"	13	-17	10	4	0.000	0.000	0.000	1.000
"	13	-18	10	4	0.000	0.000	0.000	0.500
EB Manifest Originating	14	18	10	5	0.000	0.000	1.500	0.000
"	14	-17	10	4	0.000	0.000	0.000	0.500
"	14	-13	10	4	0.000	0.000	0.000	0.500
"	14	-32	10	4	0.000	0.000	0.000	0.250
"	14	32	10	5	0.000	0.000	0.250	0.000
"	14	13	10	5	0.000	0.000	0.250	0.000
"	14	14	10	5	0.000	0.000	0.250	0.000
"	14	15	10	4	0.000	0.000	0.000	0.500
"	14	16	10	4	0.000	0.000	0.000	0.500
"	14	-19	10	4	0.000	0.000	0.000	0.500
"	14	-19	10	4	0.000	0.000	0.000	0.250
"	14	19	10	5	0.000	0.000	0.100	0.000
"	14	16	10	5	0.000	0.000	0.650	0.000
WB Manifest Terminating	15	16	10	4	0.000	0.000	0.000	1.000
"	15	15	10	4	0.000	0.000	0.000	1.000
"	15	14	10	4	0.000	0.000	0.000	1.000
"	15	13	10	4	0.000	0.000	0.000	1.000
"	15	32	10	4	0.000	0.000	0.000	1.000
"	15	31	10	4	0.000	0.000	0.000	1.000
"	15	30	10	4	0.000	0.000	0.000	1.000
"	15	29	10	4	0.000	0.000	0.000	1.000
"	15	28	10	4	0.000	0.000	0.000	1.000
"	15	21	10	4	0.000	0.000	0.000	1.000
"	15	21	10	4	0.000	0.000	0.000	1.000
"	15	28	10	4	0.000	0.000	0.000	1.000
"	15	29	10	4	0.000	0.000	0.000	1.000
"	15	33	10	4	0.500	0.500	0.000	0.500
"	15	-33	10	4	0.000	0.000	0.000	0.500
"	15	-29	10	4	0.000	0.000	0.000	1.000
"	15	-30	10	4	0.000	0.000	0.000	1.000
"	15	-31	10	4	0.000	0.000	0.000	1.000
"	15	-32	10	4	0.000	0.000	0.000	1.000
"	15	-13	10	4	0.000	0.000	0.000	1.000
"	15	-17	10	4	0.000	0.000	0.000	1.000
"	15	-18	10	4	0.000	0.000	0.000	0.500
WB Manifest Originating	16	18	10	5	0.000	0.000	1.500	0.000
"	16	-17	10	4	0.000	0.000	0.000	0.500
"	16	-13	10	4	0.000	0.000	0.000	0.500
"	16	-32	10	4	0.000	0.000	0.000	0.500
"	16	-31	10	4	0.000	0.000	0.000	0.500
"	16	-30	10	4	0.000	0.000	0.000	0.500
"	16	30	10	5	0.000	0.000	0.150	0.000
"	16	29	10	5	0.000	0.000	0.200	0.000
"	16	28	10	5	0.000	0.000	0.200	0.000
"	16	21	10	5	0.000	0.000	0.200	0.000
"	16	20	10	4	0.000	0.000	0.000	0.500
"	16	-17	10	4	0.000	0.000	0.000	0.500
"	16	17	10	5	0.000	0.000	0.150	0.000
"	16	13	10	5	0.000	0.000	0.200	0.000
"	16	32	10	5	0.000	0.000	0.200	0.000
"	16	31	10	5	0.000	0.000	0.200	0.000
"	16	30	10	4	0.000	0.000	0.000	0.500
"	16	29	10	4	0.000	0.000	0.000	0.500
"	16	28	10	4	0.000	0.000	0.000	0.500
"	16	21	10	4	0.000	0.000	0.000	0.500
"	16	20	10	4	0.000	0.000	0.000	0.500
EB West Colton Manifest Terminating	17	20	30	2	0.000	0.000	0.000	1.000
"	17	21	20	3	0.000	0.000	0.000	1.000
"	17	28	10	4	0.000	0.000	0.000	1.000
"	17	29	10	4	0.000	0.000	0.000	1.000
"	17	30	10	4	0.000	0.000	0.000	0.500
"	17	31	10	4	0.000	0.000	0.000	0.500
"	17	32	10	4	0.000	0.000	0.000	0.500
"	17	13	10	4	0.000	0.000	0.000	0.250

Movement Type	Activity Code	Segment Number	Speed (mph)	Duty Cycle Number	Non-ZTR Idle Time (hrs)	ZTR Idle Time (hrs)	Working Time - Final Train Building (hrs)	Fraction of Segment or Time Moving
"	17	14	10	4	0.000	0.000	0.000	0.250
"	17	14	10	4	0.000	0.000	0.000	0.250
"	17	13	10	4	0.000	0.000	0.000	0.250
"	17	32	10	4	0.250	0.250	0.000	0.250
"	17	-32	10	4	0.000	0.000	0.000	0.250
"	17	-13	10	4	0.000	0.000	0.000	0.500
"	17	-17	10	4	0.000	0.000	0.000	0.500
"	17	-18	10	4	0.000	0.000	0.000	0.250
"	17	33	10	4	0.000	0.000	0.000	0.500
"	17	34	10	4	0.000	0.000	0.000	0.500
"	17	35	10	4	0.000	0.000	0.000	0.500
"	17	13	10	4	0.000	0.000	0.000	0.250
"	17	14	10	4	0.000	0.000	0.000	0.250
"	17	14	10	4	0.000	0.000	0.000	0.250
"	17	13	10	4	0.000	0.000	0.000	0.250
"	17	35	10	4	0.250	0.250	0.000	0.250
"	17	-35	10	4	0.000	0.000	0.000	0.250
"	17	-13	10	4	0.000	0.000	0.000	0.500
"	17	-17	10	4	0.000	0.000	0.000	0.500
"	17	-18	10	4	0.000	0.000	0.000	0.250
EB West Colton Manifest Originating	18	18	10	5	0.000	0.000	1.500	0.000
"	18	-17	10	4	0.000	0.000	0.000	0.500
"	18	-13	10	4	0.000	0.000	0.000	0.500
"	18	-32	10	4	0.000	0.000	0.000	0.250
"	18	32	10	5	0.000	0.000	0.250	0.000
"	18	13	10	5	0.000	0.000	0.250	0.000
"	18	14	10	5	0.000	0.000	0.250	0.000
"	18	15	10	4	0.000	0.000	0.000	0.500
"	18	16	10	4	0.000	0.000	0.000	0.500
"	18	-17	10	4	0.000	0.000	0.000	0.500
"	18	-13	10	4	0.000	0.000	0.000	0.500
"	18	-35	10	4	0.000	0.000	0.000	0.250
"	18	35	10	5	0.000	0.000	0.250	0.000
"	18	13	10	5	0.000	0.000	0.250	0.000
"	18	14	10	5	0.000	0.000	0.250	0.000
"	18	15	10	4	0.000	0.000	0.000	0.500
"	18	16	10	4	0.000	0.000	0.000	0.500
WB West Colton Manifest Terminating	19	16	10	4	0.000	0.000	0.000	1.000
"	19	15	10	4	0.000	0.000	0.000	1.000
"	19	14	10	4	0.000	0.000	0.000	1.000
"	19	13	10	4	0.000	0.000	0.000	1.000
"	19	32	10	4	0.000	0.000	0.000	0.500
"	19	31	10	4	0.000	0.000	0.000	0.500
"	19	30	10	4	0.000	0.000	0.000	0.500
"	19	29	10	4	0.000	0.000	0.000	0.250
"	19	28	10	4	0.000	0.000	0.000	0.250
"	19	21	10	4	0.000	0.000	0.000	0.250
"	19	28	10	4	0.000	0.000	0.000	0.250
"	19	29	10	4	0.250	0.250	0.000	0.250
"	19	-30	10	4	0.000	0.000	0.000	0.250
"	19	-31	10	4	0.000	0.000	0.000	0.500
"	19	-32	10	4	0.000	0.000	0.000	0.500
"	19	-13	10	4	0.000	0.000	0.000	0.500
"	19	-17	10	4	0.000	0.000	0.000	0.500
"	19	-18	10	4	0.000	0.000	0.000	0.250
"	19	35	10	4	0.000	0.000	0.000	0.500
"	19	34	10	4	0.000	0.000	0.000	0.500
"	19	33	10	4	0.000	0.000	0.000	0.500
"	19	29	10	4	0.000	0.000	0.000	0.250
"	19	28	10	4	0.000	0.000	0.000	0.250
"	19	21	10	4	0.000	0.000	0.000	0.250
"	19	28	10	4	0.000	0.000	0.000	0.250
"	19	29	10	4	0.250	0.250	0.000	0.250
"	19	-33	10	4	0.000	0.000	0.000	0.250
"	19	-34	10	4	0.000	0.000	0.000	0.500
"	19	-35	10	4	0.000	0.000	0.000	0.500
"	19	-13	10	4	0.000	0.000	0.000	0.500
"	19	-17	10	4	0.000	0.000	0.000	0.500
"	19	-18	10	4	0.000	0.000	0.000	0.250

Movement Type	Activity Code	Segment Number	Speed (mph)	Duty Cycle Number	Non-ZTR Idle Time (hrs)	ZTR Idle Time (hrs)	Working Time - Final Train Building (hrs)	Fraction of Segment or Time Moving
WB West Colton Manifest Originating	20	18	10	5	0.000	0.000	1.500	0.000
"	20	-17	10	4	0.000	0.000	0.000	0.500
"	20	-13	10	4	0.000	0.000	0.000	0.500
"	20	-32	10	4	0.000	0.000	0.000	0.500
"	20	-31	10	4	0.000	0.000	0.000	0.500
"	20	-30	10	4	0.000	0.000	0.000	0.250
"	20	30	10	5	0.000	0.000	0.150	0.000
"	20	29	10	5	0.000	0.000	0.200	0.000
"	20	28	10	5	0.000	0.000	0.200	0.000
"	20	21	10	5	0.000	0.000	0.200	0.000
"	20	20	10	4	0.000	0.000	0.000	0.500
"	20	-17	10	4	0.000	0.000	0.000	0.500
"	20	-13	10	4	0.000	0.000	0.000	0.500
"	20	-35	10	4	0.000	0.000	0.000	0.500
"	20	-34	10	4	0.000	0.000	0.000	0.500
"	20	-33	10	4	0.000	0.000	0.000	0.250
"	20	33	10	5	0.000	0.000	0.150	0.000
"	20	29	10	5	0.000	0.000	0.200	0.000
"	20	28	10	5	0.000	0.000	0.200	0.000
"	20	21	10	5	0.000	0.000	0.200	0.000
"	20	20	10	4	0.000	0.000	0.000	0.500
EB Local Terminating (Alhambra Sub)	21	20	30	2	0.000	0.000	0.000	1.000
"	21	21	20	3	0.000	0.000	0.000	1.000
"	21	28	10	4	0.000	0.000	0.000	1.000
"	21	29	10	4	0.000	0.000	0.000	1.000
"	21	33	10	4	0.000	0.000	0.000	1.000
"	21	34	10	4	0.000	0.000	0.000	1.000
"	21	35	10	4	0.500	0.500	0.000	1.000
"	21	-13	10	4	0.000	0.000	0.000	1.000
"	21	-17	10	4	0.000	0.000	0.000	1.000
"	21	-18	10	4	0.000	0.000	0.000	0.500
EB Local Originating (Alhambra Sub)	22	18	10	5	0.000	0.000	1.000	0.000
"	22	-17	10	4	0.000	0.000	0.000	1.000
"	22	-13	10	4	0.000	0.000	0.000	1.000
"	22	35	10	5	0.000	0.000	0.500	0.000
"	22	13	10	4	0.000	0.000	0.000	1.000
"	22	14	10	4	0.000	0.000	0.000	1.000
"	22	15	10	4	0.000	0.000	0.000	1.000
"	22	16	10	4	0.000	0.000	0.000	1.000
WB Local Terminating (Alhambra Sub)	23	16	10	4	0.000	0.000	0.000	1.000
"	23	15	10	4	0.000	0.000	0.000	1.000
"	23	14	10	4	0.000	0.000	0.000	1.000
"	23	13	10	4	0.000	0.000	0.000	1.000
"	23	35	10	4	0.000	0.000	0.000	1.000
"	23	34	10	4	0.000	0.000	0.000	1.000
"	23	33	10	4	0.500	0.500	0.000	1.000
"	23	-33	10	4	0.000	0.000	0.000	1.000
"	23	-34	10	4	0.000	0.000	0.000	1.000
"	23	-35	10	4	0.000	0.000	0.000	1.000
"	23	-13	10	4	0.000	0.000	0.000	1.000
"	23	-17	10	4	0.000	0.000	0.000	1.000
"	23	-18	10	4	0.000	0.000	0.000	0.500
WB Local Originating (Alhambra Sub)	24	18	10	5	0.000	0.000	1.000	0.000
"	24	-17	10	4	0.000	0.000	0.000	1.000
"	24	-13	10	4	0.000	0.000	0.000	1.000
"	24	-35	10	4	0.000	0.000	0.000	1.000
"	24	-34	10	4	0.000	0.000	0.000	1.000
"	24	33	10	5	0.000	0.000	0.500	1.000
"	24	29	10	4	0.000	0.000	0.000	1.000
"	24	28	10	4	0.000	0.000	0.000	1.000
"	24	21	10	4	0.000	0.000	0.000	1.000
"	24	20	10	4	0.000	0.000	0.000	1.000
EB Local Terminating (Los Angeles Sub)	25	1	30	2	0.000	0.000	0.000	1.000
"	25	2	20	3	0.000	0.000	0.000	1.000
"	25	3	10	4	0.000	0.000	0.000	1.000
"	25	4	10	4	0.000	0.000	0.000	1.000
"	25	5	10	4	0.000	0.000	0.000	1.000
"	25	6	10	4	0.000	0.000	0.000	1.000
"	25	43	10	4	0.000	0.000	0.000	1.000

Movement Type	Activity Code	Segment Number	Speed (mph)	Duty Cycle Number	Non-ZTR Idle Time (hrs)	ZTR Idle Time (hrs)	Working Time - Final Train Building (hrs)	Fraction of Segment or Time Moving
"	25	44	10	4	0.000	0.000	0.000	1.000
"	25	40	10	4	0.000	0.000	0.000	1.000
"	25	41	10	4	0.000	0.000	0.000	1.000
"	25	42	10	4	0.000	0.000	0.000	1.000
"	25	29	10	4	0.000	0.000	0.000	1.000
"	25	33	10	4	0.000	0.000	0.000	1.000
"	25	34	10	4	0.000	0.000	0.000	1.000
"	25	35	10	4	0.000	0.000	0.000	1.000
"	25	-13	10	4	0.000	0.000	0.000	1.000
"	25	-17	10	4	0.000	0.000	0.000	1.000
"	25	-18	10	4	0.000	0.000	0.000	0.500
EB Local Originating (Los Angeles Sub)	26	18	10	5	0.000	0.000	1.000	0.000
"	26	-17	10	4	0.000	0.000	0.000	1.000
"	26	-13	10	4	0.000	0.000	0.000	1.000
"	26	-35	10	4	0.000	0.000	0.000	1.000
"	26	34	10	5	0.000	0.000	1.000	0.000
"	26	33	10	4	0.000	0.000	0.000	1.000
"	26	29	10	4	0.000	0.000	0.000	1.000
"	26	42	10	4	0.000	0.000	0.000	1.000
"	26	41	10	4	0.000	0.000	0.000	1.000
"	26	40	10	4	0.000	0.000	0.000	1.000
"	26	44	10	4	0.000	0.000	0.000	1.000
"	26	43	10	4	0.000	0.000	0.000	1.000
"	26	6	10	4	0.000	0.000	0.000	1.000
"	26	5	10	4	0.000	0.000	0.000	1.000
"	26	4	10	4	0.000	0.000	0.000	1.000
"	26	3	10	4	0.000	0.000	0.000	1.000
"	26	2	10	4	0.000	0.000	0.000	1.000
"	26	45	20	3	0.000	0.000	0.000	1.000
"	26	46	30	2	0.000	0.000	0.000	1.000
WB Local Terminating (Los Angeles Sub)	27	46	30	2	0.000	0.000	0.000	1.000
"	27	45	20	3	0.000	0.000	0.000	1.000
"	27	2	10	4	0.000	0.000	0.000	1.000
"	27	3	10	4	0.000	0.000	0.000	1.000
"	27	4	10	4	0.000	0.000	0.000	1.000
"	27	5	10	4	0.000	0.000	0.000	1.000
"	27	6	10	4	0.000	0.000	0.000	1.000
"	27	43	10	4	0.000	0.000	0.000	1.000
"	27	44	10	4	0.000	0.000	0.000	1.000
"	27	40	10	4	0.000	0.000	0.000	1.000
"	27	41	10	4	0.000	0.000	0.000	1.000
"	27	42	10	4	0.000	0.000	0.000	1.000
"	27	29	10	4	0.000	0.000	0.000	1.000
"	27	33	10	4	0.000	0.000	0.000	1.000
"	27	34	10	4	0.000	0.000	0.000	1.000
"	27	35	10	4	0.000	0.000	0.000	1.000
"	27	-13	10	4	0.000	0.000	0.000	1.000
"	27	-17	10	4	0.000	0.000	0.000	1.000
"	27	-18	10	4	0.000	0.000	0.000	0.500
WB Local Originating (Los Angeles Sub)	28	18	10	5	0.000	0.000	1.000	0.000
"	28	-17	10	4	0.000	0.000	0.000	1.000
"	28	-13	10	4	0.000	0.000	0.000	1.000
"	28	-35	10	4	0.000	0.000	0.000	1.000
"	28	34	10	5	0.000	0.000	1.000	0.000
"	28	33	10	4	0.000	0.000	0.000	1.000
"	28	29	10	4	0.000	0.000	0.000	1.000
"	28	42	10	4	0.000	0.000	0.000	1.000
"	28	41	10	4	0.000	0.000	0.000	1.000
"	28	40	10	4	0.000	0.000	0.000	1.000
"	28	44	10	4	0.000	0.000	0.000	1.000
"	28	43	10	4	0.000	0.000	0.000	1.000
"	28	6	10	4	0.000	0.000	0.000	1.000
"	28	5	10	4	0.000	0.000	0.000	1.000
"	28	4	10	4	0.000	0.000	0.000	1.000
"	28	3	10	4	0.000	0.000	0.000	1.000
"	28	2	10	4	0.000	0.000	0.000	1.000
"	28	45	10	4	0.000	0.000	0.000	1.000
"	28	46	10	5	0.000	0.000	1.000	0.000
"	28	45	10	4	0.000	0.000	0.000	1.000

Movement Type	Activity Code	Segment Number	Speed (mph)	Duty Cycle Number	Non-ZTR Idle Time (hrs)	ZTR Idle Time (hrs)	Working Time - Final Train Building (hrs)	Fraction of Segment or Time Moving
"	28	2	20	3	0.000	0.000	0.000	1.000
"	28	1	30	2	0.000	0.000	0.000	1.000
EB Power Moves Through (Alhambra Sub) without Setout	29	-20	50	1	0.000	0.000	0.000	1.000
"	29	-21	50	1	0.000	0.000	0.000	1.000
"	29	-22	50	1	0.000	0.000	0.000	1.000
"	29	-23	50	1	0.000	0.000	0.000	1.000
"	29	-24	50	1	0.000	0.000	0.000	1.000
"	29	-25	50	1	0.000	0.000	0.000	1.000
"	29	-26	50	1	0.000	0.000	0.000	1.000
"	29	-27	50	1	0.000	0.000	0.000	1.000
EB Power Moves Through (Alhambra Sub) with Setouts	30	-20	30	2	0.000	0.000	0.000	1.000
"	30	-21	20	3	0.000	0.000	0.000	1.000
"	30	-28	10	4	0.000	0.000	0.000	1.000
"	30	-29	10	4	0.000	0.000	0.000	1.000
"	30	-30	10	4	0.000	0.000	0.000	1.000
"	30	-31	10	4	0.000	0.000	0.000	1.000
"	30	-32	10	4	0.000	0.000	0.000	1.000
"	30	-13	10	4	0.000	0.000	0.000	1.000
"	30	-17	10	4	0.000	0.000	0.000	1.000
"	30	-18	10	4	0.000	0.500	0.000	1.000
"	30	-19	10	4	0.000	0.000	0.000	1.000
"	30	-16	10	4	0.000	0.000	0.000	1.000
WB Power Moves Through (Alhambra Sub) without Setou	31	-20	50	1	0.000	0.000	0.000	1.000
"	31	-21	50	1	0.000	0.000	0.000	1.000
"	31	-22	50	1	0.000	0.000	0.000	1.000
"	31	-23	50	1	0.000	0.000	0.000	1.000
"	31	-24	50	1	0.000	0.000	0.000	1.000
"	31	-25	50	1	0.000	0.000	0.000	1.000
"	31	-26	50	1	0.000	0.000	0.000	1.000
"	31	-27	50	1	0.000	0.000	0.000	1.000
WB Power Moves Through (Alhambra Sub) with Setouts	32	-20	30	2	0.000	0.000	0.000	1.000
"	32	-21	20	3	0.000	0.000	0.000	1.000
"	32	-28	10	4	0.000	0.000	0.000	1.000
"	32	-29	10	4	0.000	0.000	0.000	1.000
"	32	-30	10	4	0.000	0.000	0.000	1.000
"	32	-31	10	4	0.000	0.000	0.000	1.000
"	32	-32	10	4	0.000	0.000	0.000	1.000
"	32	-13	10	4	0.000	0.000	0.000	1.000
"	32	-17	10	4	0.000	0.000	0.000	1.000
"	32	-18	10	4	0.000	0.500	0.000	1.000
"	32	-19	10	4	0.000	0.000	0.000	1.000
"	32	-16	10	4	0.000	0.000	0.000	1.000
EB Power Moves Through (Los Angeles Sub)	33	-1	50	1	0.000	0.000	0.000	1.000
"	33	-2	50	1	0.000	0.000	0.000	1.000
"	33	-45	50	1	0.000	0.000	0.000	1.000
"	33	-46	50	1	0.000	0.000	0.000	1.000
WB Power Moves Through (Los Angeles Sub)	35	-1	50	1	0.000	0.000	0.000	1.000
"	35	-2	50	1	0.000	0.000	0.000	1.000
"	35	-45	50	1	0.000	0.000	0.000	1.000
"	35	-46	50	1	0.000	0.000	0.000	1.000
EB Power Moves Terminating	37	-20	30	2	0.000	0.000	0.000	1.000
"	37	-21	20	3	0.000	0.000	0.000	1.000
"	37	-28	10	4	0.000	0.000	0.000	1.000
"	37	-29	10	4	0.000	0.000	0.000	1.000
"	37	-30	10	4	0.000	0.000	0.000	1.000
"	37	-31	10	4	0.000	0.000	0.000	1.000
"	37	-32	10	4	0.000	0.000	0.000	1.000
"	37	-13	10	4	0.000	0.000	0.000	1.000
"	37	-17	10	4	0.000	0.000	0.000	1.000
"	37	-18	10	4	0.000	0.000	0.000	0.500
EB Power Moves Originating	38	-16	10	4	0.000	0.000	0.000	1.000
"	38	-19	10	4	0.000	0.000	0.000	1.000
"	38	-18	10	4	0.000	0.000	0.000	0.500
WB Power Moves Terminating	39	-16	10	4	0.000	0.000	0.000	1.000
"	39	-19	10	4	0.000	0.000	0.000	1.000
"	39	-18	10	4	0.000	0.000	0.000	0.500
WB Power Moves Originating	40	-20	30	2	0.000	0.000	0.000	1.000
"	40	-21	20	3	0.000	0.000	0.000	1.000
"	40	-28	10	4	0.000	0.000	0.000	1.000

Movement Type	Activity Code	Segment Number	Speed (mph)	Duty Cycle Number	Non-ZTR Idle Time (hrs)	ZTR Idle Time (hrs)	Working Time - Final Train Building (hrs)	Fraction of Segment or Time Moving
"	40	-29	10	4	0.000	0.000	0.000	1.000
"	40	-30	10	4	0.000	0.000	0.000	1.000
"	40	-31	10	4	0.000	0.000	0.000	1.000
"	40	-32	10	4	0.000	0.000	0.000	1.000
"	40	-13	10	4	0.000	0.000	0.000	1.000
"	40	-17	10	4	0.000	0.000	0.000	1.000
"	40	-18	10	4	0.000	0.000	0.000	0.500

Notes

(1) Segment numbers listed as negative values are in-yard power moves from arriving trains to service or from service to departing trains
(2) Non-ZTR Idling is the duration of an idle event when units without ZTR continue to idle after ZTR-equipped units have shut down
(3) Idling All is the duration of idling during which all locomotives continue to idle
(4) Fraction of Segment Moving is the fraction of the length of the segment over which the movement occurs or the fraction of events moving on this route
(5) Negative activity code values indicate an activity and segment where setout idling occurs

Yard Operations	Activity Code	Segment Number	Duty Cycle Number	Non-ZTR Idle Time (hrs)	ZTR Idle Time (hrs)	Fraction of Working Time
A Yard Switching	41	47	6	0	0	0.3
Intermodal Track and Bowl Yard Switching	41	48	6	0	0	0.25
Switching between A Yard/Bowl and Marne	41	49	6	0	0	0.1
Marne Yard Switching	41	50	6	0	0	0.25
East Marne to Fullerton Switching	41	16	6	0	0	0.1

Duty Cycles (Percent of Time by Notch)	Duty Cycle Number	Idle	DB	N1	N2	N3	N4	N5	N6	N7	N8
Through Trains	1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%
Setouts Approach #1	2	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Setouts Approach #2	3	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
In Yard	4	0.0%	0.0%	50.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Road Power Train Building	5	20.0%	0.0%	40.0%	40.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Yard Switching	6	59.8%	0.0%	12.4%	12.3%	5.8%	3.6%	3.6%	1.5%	0.2%	0.8%

Emission Factors Weighted by Model/Tier/ZTR Fractions - DPM g/hr per Locomotive

Locomotive Model Group	Group ID	Idle-NonZTR	Idle-All	DB	N1	N2	N3	N4	N5	N6	N7	N8
California Fuel (221 ppm S)												
Service	1	12.31	27.08	47.11	44.84	96.82	215.82	272.23	360.31	548.81	629.96	706.16
LoadTest	2	7.71	25.8	54.68	46.26	106.38	237.34	278.94	337.14	554.72	654.66	732.35
47-State Fuel (2639 ppm S)												
Service	1	12.31	27.08	47.11	44.84	96.82	225.99	288.97	385.62	585.35	671.84	755.13
LoadTest	2	7.71	25.8	54.68	46.26	106.38	247.19	296.24	361.94	590.48	691.46	775.46

Note: Idle-NonZTR is the average per-locomotive idle emission rate for the fraction of locomotives not equipped with ZTR/Auto start-stop technology

Service and Shop Activity

			Duration of Activity per Locomotive (minutes)										
Activity	Number of Locomotives	Fraction of Calif. Fuel	Idle-NonZTR	Idle-All	DB	N1	N2	N3	N4	N5	N6	N7	N8
Service Events	299	0.00	0	60	0	0	0	0	0	0	0	0	0
Pre-Maintenance Load Test	1	0.90	0	2	0	0	0	0	0	0	0	0	8
Post-Maintenance Load Test	1	0.90	0	10	0	10	0	0	0	0	0	0	10
Unscheduled Mtc Post Test	9	0.90	0	5	0	0	0	0	0	0	0	0	10

Locomotive Model Distributions

Locomotives Serviced

Technology	ZTR/AESS	Switcher	GP-3x	GP-4x	SD-50	GP-60	SD-7x	SD-90	Dash 7	Dash 8	Dash 9	C-60
Pre Tier 0	**No**	0.0000	0.0109	0.0580	0.0036	0.0181	0.0000	0.0000	0.0000	0.0326	0.0435	0.0000
Pre Tier 0	**Yes**	0.0000	0.0217	0.0036	0.0000	0.0073	0.0000	0.0000	0.0000	0.0000	0.0217	0.0000
Tier 0	**No**	0.0000	0.0000	0.0000	0.0000	0.0073	0.1884	0.0000	0.0000	0.0109	0.0652	0.0000
Tier 0	**Yes**	0.0036	0.0073	0.0109	0.0000	0.0036	0.0036	0.0000	0.0000	0.0000	0.0145	0.0000
Tier 1	**No**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	**Yes**	0.0000	0.0000	0.0000	0.0000	0.0000	0.2862	0.0000	0.0000	0.0000	0.0073	0.0000
Tier 2	**No**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 2	**Yes**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0833	0.0000	0.0000	0.0000	0.0870	0.0000

Locomotives Load Tested Technology	ZTR/AESS	Switcher	GP-3x	GP-4x	SD-50	GP-60	SD-7x	SD-90	Dash 7	Dash 8	Dash 9	C-60
Pre Tier 0	**No**	0.0000	0.0000	0.0000	0.0833	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pre Tier 0	**Yes**	0.0000	0.0000	0.0000	0.0000	0.0833	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 0	**No**	0.0000	0.0000	0.0000	0.0000	0.0000	0.1667	0.0000	0.0000	0.0833	0.0000	0.0000
Tier 0	**Yes**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	**No**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	**Yes**	0.0000	0.0000	0.0000	0.0000	0.0000	0.2500	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 2	**No**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 2	**Yes**	0.0000	0.0000	0.0000	0.0000	0.0000	0.2500	0.0000	0.0000	0.0000	0.0833	0.0000

Example 1 -- EB Departing Intermodal Trains

Parameter	Value
Activity Code	10
Number of Events	797
Locomotives per Consist on Train	2.837
Number of Setouts	1
Locomotives per Consist Working During Power Moves	1.5
Emission Factor Group	2
Fraction of California Fuel	0.90

Route Followed	Activity Code	Segment Number	Length (miles)	Speed (mph)	Duty Cycle	Power Move	Non-ZTR Idle (hrs)	ZTR Idle (hrs)	Working Time - Final Train Building (hrs)	Fraction of Segment Moving	Locomotive Hours Moving (Duty Cycle 4)	Locomotive Hours Working (Duty Cycle 5)	Locomotive Hours NonZTR Idle	Locomotive Hours ZTR Idle
Consist Preparation:														
Marne South Track	10	18	0.2811	10	5	N	0	0	1.5	0	0.00	3391.63	0.00	0.00
A Yard Departures:														
West Marne to Marne South Track	10	-17	0.1554	10	4	Y	0	0	0	0.5	9.29	0.00	0.00	0.00
East Bowl to Mid Yard	10	-13	0.2799	10	4	Y	0	0	0	0.5	16.73	0.00	0.00	0.00
A Yard East Middle	10	-32	0.3275	10	4	Y	0	0	0	0.25	9.79	0.00	0.00	0.00
A Yard East Middle	10	32	0.3275	10	5	N	0	0	0.25	0	0.00	565.27	0.00	0.00
East Bowl to Mid Yard	10	13	0.2799	10	5	N	0	0	0.25	0	0.00	565.27	0.00	0.00
Mid Yard to West Marne	10	14	0.2851	10	5	N	0	0	0.25	0	0.00	565.27	0.00	0.00
Marne North Track	10	15	0.2851	10	4	N	0	0	0	0.5	32.23	0.00	0.00	0.00
East Marne to Fullerton	10	16	0.6980	10	4	N	0	0	0	0.5	78.91	0.00	0.00	0.00
Marne Yard Departures:														
Marne South Track to East Marne	10	-19	0.1401	10	4	Y	0	0	0	0.5	8.38	0.00	0.00	0.00
Marne South Track to East Marne	10	-19	0.1401	10	4	Y	0	0	0	0.25	4.19	0.00	0.00	0.00
Marne South Track to East Marne	10	19	0.1401	10	5	N	0	0	0.1	0	0.00	226.11	0.00	0.00
East Marne to Fullerton	10	16	0.6980	10	5	N	0	0	0.65	0	0.00	1469.71	0.00	0.00

Note: EB intermodal departures are from both the A Yard (50%) and the Marne Yard (50%)

Total											*159.51*	*6783.27*	*0.00*	*0.00*

Emission Factors	Group ID	Idle-NonZTR	Idle-All	DB	N1	N2	N3	N4	N5	N6	N7	N8
Departing IM Trains - CA Fuel	2	11.9	23.2	41.8	45.7	97.2	224.0	288.3	361.4	563.4	664.9	742.1
Departing IM Trains - 47-State Fuel	2	11.9	23.2	41.8	45.7	97.2	234.5	306.1	387.0	600.7	707.6	792.2
CA Fuel Fraction Adjusted Rates		*11.9*	*23.2*	*41.8*	*45.7*	*97.2*	*225.0*	*290.1*	*364.0*	*567.2*	*669.1*	*747.1*
	Duty Cycle											
Duty Cycle Moving	4	0.00	0.00	0.00	0.50	0.50	0.00	0.00	0.00	0.00	0.00	0.00
Duty Cycle Working	5	0.20	0.20	0.00	0.40	0.40	0.00	0.00	0.00	0.00	0.00	0.00
Weighted g/hr emissions	4	0.00	0.00	0.00	22.86	48.59	0.00	0.00	0.00	0.00	0.00	0.00
	5	2.39	4.64	0.00	18.29	38.87	0.00	0.00	0.00	0.00	0.00	0.00

	Moving (Duty Cycle 4)	Working (Duty Cycle 5)	Idle-NonZTR	Idle-All
Emission Rate (g/hr)	71.45	64.18	11.93	23.2
Locomotive Hours	159.51	6783.27	0.00	0.00
Total Emissions (g/yr)	**11397**	**435364**	**0**	**0**

Example 2 -- Unscheduled Maintenance Load Testing

Number of Unscheduled Maintenance Load Tests	9											
Fraction of Calif. Fuel	0.90											
Emission Factors (g/hr)	**Group ID**	**Idle-NonZTR**	**Idle-All**	**DB**	**N1**	**N2**	**N3**	**N4**	**N5**	**N6**	**N7**	**N8**
Load Test - CA Fuel	2	7.71	25.80	54.68	46.26	106.38	237.34	278.94	337.14	554.72	654.66	732.35
Load Test - 47-State Fuel	2	7.71	25.8	54.68	46.26	106.38	247.19	296.24	361.94	590.48	691.46	775.46
CA Fuel Fraction Adjusted Rates		*7.71*	*25.80*	*54.68*	*46.26*	*106.38*	*238.33*	*280.67*	*339.62*	*558.30*	*658.34*	*736.66*

		Duration (minutes)										
Activity	**Number of Locomotives**	**Idle-NonZTR**	**Idle-All**	**DB**	**N1**	**N2**	**N3**	**N4**	**N5**	**N6**	**N7**	**N8**
Unscheduled Mtc Post Test	9	0	5	0	0	0	0	0	0	0	0	10
Emissions (g)												
Notch-Specific		0.0	19.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1105.0

Total Emissions (g/yr)	**1124**

LOCOMOTIVE DATA
2012 SAMPLE CALCULATIONS

Activity Types

Description	Activity Code	Number of Events/Year	Locomotives per Consist	Number of Setouts	Emission Factor Group	Locomotives per Consist Working	Fraction of Calif. Fuel
EB Through (Alhambra Sub) without Setouts	1	315	3.021	513	1	3.021	0.5
EB Through (Alhambra Sub) with Setouts	2	480	3.021	513	1	3.021	0.5
WB Through (Alhambra Sub) without Setouts	3	2235	2.992	1087	1	2.992	0.5
WB Through (Alhambra Sub) with Setouts	4	1017	2.992	1087	1	2.992	0.5
EB Through (Los Angeles Sub) without Setouts	5	5	3.412	12	1	3.412	0.5
EB Through (Los Angeles Sub) with Setouts	6	11	3.412	12	1	3.412	0.5
WB Through (Los Angeles Sub) without Setouts	7	18	2.524	2	1	2.524	0.5
WB Through (Los Angeles Sub) with Setouts	8	2	2.524	2	1	2.524	0.5
EB Intermodal Terminating	9	43	2.356	0	2	2.356	0.0
EB Intermodal Originating	10	686	2.985	0	2	2.985	0.9
WB Intermodal Terminating	11	51	1.925	0	2	1.925	0.0
WB Intermodal Originating	12	798	2.496	0	2	2.496	0.9
EB Manifest Terminating	13	2	2.000	0	3	2.000	0.0
EB Manifest Originating	14	100	2.290	0	3	2.290	0.9
WB Manifest Terminating	15	92	3.081	0	3	3.081	0.0
WB Manifest Originating	16	37	2.575	0	3	2.575	0.9
EB West Colton Manifest Terminating	17	0	0.000	0	4	1.000	0.9
EB West Colton Manifest Originating	18	155	2.892	0	4	2.892	0.9
WB West Colton Manifest Terminating	19	91	3.286	0	4	3.286	0.9
WB West Colton Manifest Originating	20	25	3.333	0	4	3.333	0.9
EB Local Terminating (Alhambra Sub)	21	417	2.012	0	5	2.012	1.0
EB Local Originating (Alhambra Sub)	22	400	2.052	0	5	2.052	1.0
WB Local Terminating (Alhambra Sub)	23	177	1.729	0	5	1.729	1.0
WB Local Originating (Alhambra Sub)	24	366	2.270	0	5	2.270	1.0
EB Local Terminating (Los Angeles Sub)	25	58	1.975	0	5	1.975	1.0
EB Local Originating (Los Angeles Sub)	26	181	1.931	0	5	1.931	1.0
WB Local Terminating (Los Angeles Sub)	27	253	1.974	0	5	1.974	1.0
WB Local Originating (Los Angeles Sub)	28	417	1.968	0	5	1.968	1.0
EB Power Moves Through (Alhambra Sub) without Setouts	29	32	4.750	6	1	1.500	0.5
EB Power Moves Through (Alhambra Sub) with Setouts	30	6	4.750	6	1	1.500	0.5
WB Power Moves Through (Alhambra Sub) without Setouts	31	64	4.014	4	1	1.500	0.5
WB Power Moves Through (Alhambra Sub) with Setouts	32	4	4.014	4	1	1.500	0.5
EB Power Moves Through (Los Angeles Sub)	33	1	1.000	0	1	1.000	0.5
WB Power Moves Through (Los Angeles Sub)	35	1	2.000	0	1	1.500	0.5
EB Power Moves Terminating	37	1492	2.119	0	6	1.500	0.0
EB Power Moves Originating	38	65	2.741	0	6	1.500	0.9
WB Power Moves Terminating	39	1197	2.019	0	6	1.500	0.0
WB Power Moves Originating	40	100	2.264	0	6	1.500	0.9
Yard Operations (Hours)	41	3098	2.000	0	7	2.000	1.0

		Emission Factors Weighted by Model/Tier/ZTR Fractions - DPM g/hr per Locomotive										
Consist Groups	**Group ID**	**Idle-NonZTR**	**Idle-All**	**DB**	**N1**	**N2**	**N3**	**N4**	**N5**	**N6**	**N7**	**N8**
California Fuel (221 ppm S)												
Through Trains and Power Moves	1	8.20	21.26	50.37	48.98	121.16	238.66	284.94	345.90	480.83	586.81	655.44
Intermodal Trains	2	6.69	20.59	50.49	50.19	122.89	240.24	286.07	346.63	478.52	559.45	614.21
Manifest Trains	3	7.89	20.52	50.42	50.90	123.44	239.79	286.77	354.58	472.51	561.29	621.68
West Colton Manifest Trains	4	12.90	21.60	45.07	45.89	115.26	237.24	290.13	362.31	504.25	690.60	795.17
Local Trains	5	7.32	26.71	58.33	43.52	124.85	222.50	254.34	300.07	427.93	523.93	619.24
In-Yard Power Moves	6	7.76	24.79	56.05	46.10	125.06	228.95	265.30	317.01	444.06	531.67	612.61
Yard Switching	7	47.94	47.94	80.04	35.70	134.30	210.86	226.39	286.24	483.85	580.13	744.65
47-State Fuel (2639 ppm S)												
Through Trains and Power Moves	1	8.20	21.26	50.37	48.98	121.16	239.67	286.36	347.82	483.50	590.39	659.61
Intermodal Trains	2	6.69	20.59	50.49	50.19	122.89	241.30	287.49	348.52	481.22	563.12	618.45
Manifest Trains	3	7.89	20.52	50.42	50.90	123.44	240.88	288.19	356.49	475.20	565.10	626.09
West Colton Manifest Trains	4	12.90	21.60	45.07	45.89	115.26	238.15	291.59	364.41	506.98	694.15	799.39
Local Trains	5	7.32	26.71	58.33	43.52	124.85	223.36	255.61	301.79	430.26	526.81	622.73
In-Yard Power Moves	6	7.76	24.79	56.05	46.10	125.06	229.89	266.62	318.79	446.52	534.85	616.39
Yard Switching	7	N/A -- Hump and trim sets operate on 100% California Fuel										

Note: Idle-NonZTR is the average per-locomotive idle emission rate for the fraction of locomotives not equipped with ZTR/Auto start-stop technology

Locomotive Model Distributions
Through Trains and Power Moves

Technology	**ZTR/AESS**	**Switcher**	**GP-3x**	**GP-4x**	**SD-50**	**GP-60**	**SD-7x**	**SD-90**	**Dash 7**	**Dash 8**	**Dash 9**	**C-60**
Pre Tier 0	**No**	0.0000	0.0000	0.0315	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pre Tier 0	**Yes**	0.0003	0.0057	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 0	**No**	0.0000	0.0000	0.0218	0.0000	0.0999	0.0658	0.0006	0.0000	0.0286	0.0428	0.0004
Tier 0	**Yes**	0.0006	0.0127	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	**No**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	**Yes**	0.0000	0.0007	0.0000	0.0000	0.0000	0.0648	0.0000	0.0000	0.0000	0.0143	0.0000
Tier 2	**No**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 2	**Yes**	0.0000	0.0003	0.0000	0.0000	0.0000	0.3275	0.0000	0.0000	0.0000	0.2818	0.0000

Intermodal Trains

Technology	ZTR/AESS	Switcher	GP-3x	GP-4x	SD-50	GP-60	SD-7x	SD-90	Dash 7	Dash 8	Dash 9	C-60
Pre Tier 0	No	0.0000	0.0000	0.0201	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pre Tier 0	Yes	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 0	No	0.0000	0.0000	0.0140	0.0000	0.0215	0.0889	0.0010	0.0000	0.0281	0.0641	0.0004
Tier 0	Yes	0.0000	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0875	0.0000	0.0000	0.0000	0.0215	0.0000
Tier 2	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 2	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.3547	0.0000	0.0000	0.0000	0.2976	0.0000

Manifest Trains

Technology	ZTR/AESS	Switcher	GP-3x	GP-4x	SD-50	GP-60	SD-7x	SD-90	Dash 7	Dash 8	Dash 9	C-60
Pre Tier 0	No	0.0000	0.0000	0.0202	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pre Tier 0	Yes	0.0006	0.0006	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 0	No	0.0000	0.0000	0.0140	0.0000	0.0716	0.0617	0.0011	0.0000	0.0264	0.0799	0.0012
Tier 0	Yes	0.0014	0.0014	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	Yes	0.0001	0.0001	0.0000	0.0000	0.0000	0.0608	0.0000	0.0000	0.0000	0.0268	0.0000
Tier 2	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 2	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.3227	0.0000	0.0000	0.0000	0.3093	0.0000

West Colton Manifest Trains

Technology	ZTR/AESS	Switcher	GP-3x	GP-4x	SD-50	GP-60	SD-7x	SD-90	Dash 7	Dash 8	Dash 9	C-60
Pre Tier 0	No	0.0000	0.0000	0.0614	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pre Tier 0	Yes	0.0003	0.0025	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 0	No	0.0000	0.0000	0.0425	0.0000	0.3569	0.0042	0.0000	0.0000	0.0029	0.0064	0.0000
Tier 0	Yes	0.0007	0.0056	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	Yes	0.0000	0.0003	0.0000	0.0000	0.0000	0.0041	0.0000	0.0000	0.0000	0.0022	0.0000
Tier 2	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 2	Yes	0.0000	0.0001	0.0000	0.0000	0.0000	0.2549	0.0000	0.0000	0.0000	0.2548	0.0000

Local Trains

Technology	ZTR/AESS	Switcher	GP-3x	GP-4x	SD-50	GP-60	SD-7x	SD-90	Dash 7	Dash 8	Dash 9	C-60
Pre Tier 0	No	0.0000	0.0000	0.0683	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pre Tier 0	Yes	0.0008	0.0867	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 0	No	0.0000	0.0000	0.0473	0.0000	0.0832	0.0004	0.0000	0.0000	0.0002	0.0006	0.0000
Tier 0	Yes	0.0017	0.1936	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	Yes	0.0001	0.0109	0.0000	0.0000	0.0000	0.0004	0.0000	0.0000	0.0000	0.0002	0.0000
Tier 2	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 2	Yes	0.0000	0.0050	0.0000	0.0000	0.0000	0.2504	0.0000	0.0000	0.0000	0.2504	0.0000

In-Yard Power Moves

Technology	ZTR/AESS	Switcher	GP-3x	GP-4x	SD-50	GP-60	SD-7x	SD-90	Dash 7	Dash 8	Dash 9	C-60
Pre Tier 0	No	0.0000	0.0000	0.0598	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pre Tier 0	Yes	0.0008	0.0535	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 0	No	0.0000	0.0000	0.0414	0.0000	0.0546	0.0289	0.0004	0.0000	0.0091	0.0276	0.0005
Tier 0	Yes	0.0017	0.1194	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	Yes	0.0001	0.0067	0.0000	0.0000	0.0000	0.0285	0.0000	0.0000	0.0000	0.0093	0.0000
Tier 2	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 2	Yes	0.0000	0.0031	0.0000	0.0000	0.0000	0.2840	0.0000	0.0000	0.0000	0.2705	0.0000

Yard Switching*

Technology	ZTR/AESS	Switcher	GP-3x	GP-4x	SD-50	GP-60	SD-7x	SD-90	Dash 7	Dash 8	Dash 9	C-60
Pre Tier 0	No	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pre Tier 0	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 0	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 0	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 2	No	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 2	Yes	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

*** Yard switching emissions calculated as SD-40 emissions with 85% control factor for ULEL gensets from mid-2007.**

Track Segment	Segment Number	Length (mi)
Los Angeles Sub West End	1	0.2651
Los Angeles Sub #2	2	0.1754
Los Angeles Sub Lead #1	3	0.0537
Los Angeles Sub Lead #2	4	0.0436
Los Angeles Sub Lead #3	5	0.0248
Los Angeles Sub Lead #4	6	0.0329
East Bowl to Mid Yard	13	0.2799
Mid Yard to West Marne	14	0.2851
Marne North Track	15	0.2851
East Marne to Fullerton	16	0.6980
West Marne to Marne South Track	17	0.1554
Marne South Track	18	0.2811
Marne South Track to East Marne	19	0.1401
Alhambra Sub West End	20	0.1863
Alhambra Sub #2	21	0.1863
Alhambra Sub #3	22	0.2530
Alhambra Sub #4	23	0.2207
Alhambra Sub #5	24	0.2702
Alhambra Sub #6	25	0.7284
Alhambra Sub #7	26	0.5547
Alhambra Sub #8	27	0.6778
Alhambra Sub Lead #1	28	0.1977
Alhambra Sub Lead #2	29	0.1164
A Yard West End	30	0.1584
A Yard West Middle	31	0.3410
A Yard East Middle	32	0.3275
Bowl West End	33	0.1715
Bowl Middle	34	0.4917
Bowl East End	35	0.2016
Los Angeles Sub Lead #7	40	0.0639
Los Angeles Sub Lead #8	41	0.0617
Los Angeles Sub Lead #9	42	0.0552
Los Angeles Sub Lead #5	43	0.0286
Los Angeles Sub Lead #6	44	0.0581
Los Angeles Sub #3	45	1.4558
Azusa Yard	46	0.3568
A Yard Switching	47	0.7644
Intermodal Track and Bowl Yard Switching	48	0.7446
Switching between A Yard/Bowl and Marne	49	0.3618
Marne Yard Switching	50	0.5270

Movement Type	Activity Code	Segment Number	Speed (mph)	Duty Cycle Number	Non-ZTR Idle Time (hrs)	ZTR Idle Time (hrs)	Working Time - Final Train Building (hrs)	Fraction of Segment or Time Moving
EB Through (Alhambra Sub) without Setouts	1	20	50	1	0.000	0.000	0.000	1.000
"	1	21	50	1	0.000	0.000	0.000	1.000
"	1	22	50	1	0.000	0.000	0.000	1.000
"	1	23	50	1	0.000	0.000	0.000	1.000
"	1	24	50	1	0.000	0.000	0.000	1.000
"	1	25	50	1	0.000	0.000	0.000	1.000
"	1	26	50	1	0.000	0.000	0.000	1.000
"	1	27	50	1	0.000	0.000	0.000	1.000
EB Through (Alhambra Sub) with Setouts	2	20	30	2	0.000	0.000	0.000	1.000
"	2	21	20	3	0.000	0.000	0.000	1.000
"	2	28	10	4	0.000	0.000	0.000	1.000
"	2	29	10	4	0.000	0.000	0.000	1.000
"	2	30	10	4	0.000	0.000	0.000	1.000
"	2	31	10	4	0.500	0.000	0.000	1.000
"	2	32	10	4	0.000	0.000	0.000	1.000
"	2	13	10	4	0.000	0.000	0.000	1.000
"	2	14	10	4	0.000	0.000	0.000	1.000
"	2	15	10	4	0.000	0.000	0.000	1.000
"	2	16	10	4	0.000	0.000	0.000	1.000
WB Through (Alhambra Sub) without Setouts	3	20	50	1	0.000	0.000	0.000	1.000
"	3	21	50	1	0.000	0.000	0.000	1.000
"	3	22	50	1	0.000	0.000	0.000	1.000
"	3	23	50	1	0.000	0.000	0.000	1.000
"	3	24	50	1	0.000	0.000	0.000	1.000
"	3	25	50	1	0.000	0.000	0.000	1.000
"	3	26	50	1	0.000	0.000	0.000	1.000
"	3	27	50	1	0.000	0.000	0.000	1.000
WB Through (Alhambra Sub) with Setouts	4	20	30	2	0.000	0.000	0.000	1.000
"	4	21	20	3	0.000	0.000	0.000	1.000
"	4	28	10	4	0.000	0.000	0.000	1.000
"	4	29	10	4	0.000	0.000	0.000	1.000
"	4	30	10	4	0.000	0.000	0.000	1.000
"	4	31	10	4	0.500	0.000	0.000	1.000
"	4	32	10	4	0.000	0.000	0.000	1.000
"	4	13	10	4	0.000	0.000	0.000	1.000
"	4	14	10	4	0.000	0.000	0.000	1.000
"	4	15	10	4	0.000	0.000	0.000	1.000
"	4	16	10	4	0.000	0.000	0.000	1.000
EB Through (Los Angeles Sub) without Setouts	5	1	50	1	0.000	0.000	0.000	1.000
"	5	2	50	1	0.000	0.000	0.000	1.000
"	5	45	50	1	0.000	0.000	0.000	1.000
"	5	46	50	1	0.000	0.000	0.000	1.000
EB Through (Los Angeles Sub) with Setouts	6	1	50	1	0.000	0.000	0.000	1.000
"	6	2	30	2	0.000	0.000	0.000	1.000
"	6	45	20	3	0.000	0.000	0.000	1.000
"	6	46	10	4	0.000	0.500	0.000	1.000
WB Through (Los Angeles Sub) without Setouts	7	1	50	1	0.000	0.000	0.000	1.000
"	7	2	50	1	0.000	0.000	0.000	1.000
"	7	45	50	1	0.000	0.000	0.000	1.000
"	7	46	50	1	0.000	0.000	0.000	1.000
WB Through (Los Angeles Sub) with Setouts	8	1	50	1	0.000	0.000	0.000	1.000
"	8	2	30	2	0.000	0.000	0.000	1.000
"	8	45	20	3	0.000	0.000	0.000	1.000
"	8	46	10	4	0.000	0.500	0.000	1.000
EB Intermodal Terminating	9	20	30	2	0.000	0.000	0.000	1.000
"	9	21	20	3	0.000	0.000	0.000	1.000
"	9	28	10	4	0.000	0.000	0.000	1.000
"	9	29	10	4	0.000	0.000	0.000	1.000
"	9	30	10	4	0.000	0.000	0.000	1.000
"	9	31	10	4	0.000	0.000	0.000	1.000
"	9	32	10	4	0.000	0.000	0.000	1.000
"	9	13	10	4	0.000	0.000	0.000	1.000
"	9	14	10	4	0.000	0.000	0.000	1.000
"	9	14	10	4	0.000	0.000	0.000	1.000
"	9	13	10	4	0.000	0.000	0.000	1.000
"	9	32	10	4	0.500	0.500	0.000	0.500
"	9	-32	10	4	0.000	0.000	0.000	0.500
"	9	-13	10	4	0.000	0.000	0.000	1.000

Movement Type	Activity Code	Segment Number	Speed (mph)	Duty Cycle Number	Non-ZTR Idle Time (hrs)	ZTR Idle Time (hrs)	Working Time - Final Train Building (hrs)	Fraction of Segment or Time Moving
"	9	-17	10	4	0.000	0.000	0.000	1.000
"	9	-18	10	4	0.000	0.000	0.000	0.500
EB Intermodal Originating	10	18	10	5	0.000	0.000	1.500	0.000
"	10	-17	10	4	0.000	0.000	0.000	0.500
"	10	-13	10	4	0.000	0.000	0.000	0.500
"	10	-32	10	4	0.000	0.000	0.000	0.250
"	10	32	10	5	0.000	0.000	0.250	0.000
"	10	13	10	5	0.000	0.000	0.250	0.000
"	10	14	10	5	0.000	0.000	0.250	0.000
"	10	15	10	4	0.000	0.000	0.000	0.500
"	10	16	10	4	0.000	0.000	0.000	0.500
"	10	-19	10	4	0.000	0.000	0.000	0.500
"	10	-19	10	4	0.000	0.000	0.000	0.250
"	10	19	10	5	0.000	0.000	0.100	0.000
"	10	16	10	5	0.000	0.000	0.650	0.000
WB Intermodal Terminating	11	16	10	4	0.000	0.000	0.000	1.000
"	11	15	10	4	0.000	0.000	0.000	1.000
"	11	14	10	4	0.000	0.000	0.000	1.000
"	11	13	10	4	0.000	0.000	0.000	1.000
"	11	32	10	4	0.000	0.000	0.000	1.000
"	11	31	10	4	0.000	0.000	0.000	1.000
"	11	30	10	4	0.000	0.000	0.000	1.000
"	11	29	10	4	0.000	0.000	0.000	1.000
"	11	28	10	4	0.000	0.000	0.000	1.000
"	11	21	10	4	0.000	0.000	0.000	1.000
"	11	21	10	4	0.000	0.000	0.000	1.000
"	11	28	10	4	0.000	0.000	0.000	1.000
"	11	29	10	4	0.000	0.000	0.000	1.000
"	11	33	10	4	0.500	0.500	0.000	0.500
"	11	-33	10	4	0.000	0.000	0.000	0.500
"	11	-29	10	4	0.000	0.000	0.000	1.000
"	11	-30	10	4	0.000	0.000	0.000	1.000
"	11	-31	10	4	0.000	0.000	0.000	1.000
"	11	-32	10	4	0.000	0.000	0.000	1.000
"	11	-13	10	4	0.000	0.000	0.000	1.000
"	11	-17	10	4	0.000	0.000	0.000	1.000
"	11	-18	10	4	0.000	0.000	0.000	0.500
WB Intermodal Originating	12	18	10	5	0.000	0.000	1.500	0.000
"	12	-17	10	4	0.000	0.000	0.000	0.500
"	12	-13	10	4	0.000	0.000	0.000	0.500
"	12	-32	10	4	0.000	0.000	0.000	0.500
"	12	-31	10	4	0.000	0.000	0.000	0.500
"	12	-30	10	4	0.000	0.000	0.000	0.500
"	12	30	10	5	0.000	0.000	0.150	0.000
"	12	29	10	5	0.000	0.000	0.200	0.000
"	12	28	10	5	0.000	0.000	0.200	0.000
"	12	21	10	5	0.000	0.000	0.200	0.000
"	12	20	10	4	0.000	0.000	0.000	0.500
"	12	-17	10	4	0.000	0.000	0.000	0.500
"	12	17	10	5	0.000	0.000	0.150	0.000
"	12	13	10	5	0.000	0.000	0.200	0.000
"	12	32	10	5	0.000	0.000	0.200	0.000
"	12	31	10	5	0.000	0.000	0.200	0.000
"	12	30	10	4	0.000	0.000	0.000	0.500
"	12	29	10	4	0.000	0.000	0.000	0.500
"	12	28	10	4	0.000	0.000	0.000	0.500
"	12	21	10	4	0.000	0.000	0.000	0.500
"	12	20	10	4	0.000	0.000	0.000	0.500
EB Manifest Terminating	13	20	30	2	0.000	0.000	0.000	1.000
"	13	21	20	3	0.000	0.000	0.000	1.000
"	13	28	10	4	0.000	0.000	0.000	1.000
"	13	29	10	4	0.000	0.000	0.000	1.000
"	13	30	10	4	0.000	0.000	0.000	1.000
"	13	31	10	4	0.000	0.000	0.000	1.000
"	13	32	10	4	0.000	0.000	0.000	1.000
"	13	13	10	4	0.000	0.000	0.000	1.000
"	13	14	10	4	0.000	0.000	0.000	1.000
"	13	14	10	4	0.000	0.000	0.000	1.000
"	13	13	10	4	0.000	0.000	0.000	1.000

Movement Type	Activity Code	Segment Number	Speed (mph)	Duty Cycle Number	Non-ZTR Idle Time (hrs)	ZTR Idle Time (hrs)	Working Time - Final Train Building (hrs)	Fraction of Segment or Time Moving
"	13	32	10	4	0.500	0.500	0.000	0.500
"	13	-32	10	4	0.000	0.000	0.000	0.500
"	13	-13	10	4	0.000	0.000	0.000	1.000
"	13	-17	10	4	0.000	0.000	0.000	1.000
"	13	-18	10	4	0.000	0.000	0.000	0.500
EB Manifest Originating	14	18	10	5	0.000	0.000	1.500	0.000
"	14	-17	10	4	0.000	0.000	0.000	0.500
"	14	-13	10	4	0.000	0.000	0.000	0.500
"	14	-32	10	4	0.000	0.000	0.000	0.250
"	14	32	10	5	0.000	0.000	0.250	0.000
"	14	13	10	5	0.000	0.000	0.250	0.000
"	14	14	10	5	0.000	0.000	0.250	0.000
"	14	15	10	4	0.000	0.000	0.000	0.500
"	14	16	10	4	0.000	0.000	0.000	0.500
"	14	-19	10	4	0.000	0.000	0.000	0.500
"	14	-19	10	4	0.000	0.000	0.000	0.250
"	14	19	10	5	0.000	0.000	0.100	0.000
"	14	16	10	5	0.000	0.000	0.650	0.000
WB Manifest Terminating	15	16	10	4	0.000	0.000	0.000	1.000
"	15	15	10	4	0.000	0.000	0.000	1.000
"	15	14	10	4	0.000	0.000	0.000	1.000
"	15	13	10	4	0.000	0.000	0.000	1.000
"	15	32	10	4	0.000	0.000	0.000	1.000
"	15	31	10	4	0.000	0.000	0.000	1.000
"	15	30	10	4	0.000	0.000	0.000	1.000
"	15	29	10	4	0.000	0.000	0.000	1.000
"	15	28	10	4	0.000	0.000	0.000	1.000
"	15	21	10	4	0.000	0.000	0.000	1.000
"	15	21	10	4	0.000	0.000	0.000	1.000
"	15	28	10	4	0.000	0.000	0.000	1.000
"	15	29	10	4	0.000	0.000	0.000	1.000
"	15	33	10	4	0.500	0.500	0.000	0.500
"	15	-33	10	4	0.000	0.000	0.000	0.500
"	15	-29	10	4	0.000	0.000	0.000	1.000
"	15	-30	10	4	0.000	0.000	0.000	1.000
"	15	-31	10	4	0.000	0.000	0.000	1.000
"	15	-32	10	4	0.000	0.000	0.000	1.000
"	15	-13	10	4	0.000	0.000	0.000	1.000
"	15	-17	10	4	0.000	0.000	0.000	1.000
"	15	-18	10	4	0.000	0.000	0.000	0.500
WB Manifest Originating	16	18	10	5	0.000	0.000	1.500	0.000
"	16	-17	10	4	0.000	0.000	0.000	0.500
"	16	-13	10	4	0.000	0.000	0.000	0.500
"	16	-32	10	4	0.000	0.000	0.000	0.500
"	16	-31	10	4	0.000	0.000	0.000	0.500
"	16	-30	10	4	0.000	0.000	0.000	0.500
"	16	30	10	5	0.000	0.000	0.150	0.000
"	16	29	10	5	0.000	0.000	0.200	0.000
"	16	28	10	5	0.000	0.000	0.200	0.000
"	16	21	10	5	0.000	0.000	0.200	0.000
"	16	20	10	4	0.000	0.000	0.000	0.500
"	16	-17	10	4	0.000	0.000	0.000	0.500
"	16	17	10	5	0.000	0.000	0.150	0.000
"	16	13	10	5	0.000	0.000	0.200	0.000
"	16	32	10	5	0.000	0.000	0.200	0.000
"	16	31	10	5	0.000	0.000	0.200	0.000
"	16	30	10	4	0.000	0.000	0.000	0.500
"	16	29	10	4	0.000	0.000	0.000	0.500
"	16	28	10	4	0.000	0.000	0.000	0.500
"	16	21	10	4	0.000	0.000	0.000	0.500
"	16	20	10	4	0.000	0.000	0.000	0.500
EB West Colton Manifest Terminating	17	20	30	2	0.000	0.000	0.000	1.000
"	17	21	20	3	0.000	0.000	0.000	1.000
"	17	28	10	4	0.000	0.000	0.000	1.000
"	17	29	10	4	0.000	0.000	0.000	1.000
"	17	30	10	4	0.000	0.000	0.000	0.500
"	17	31	10	4	0.000	0.000	0.000	0.500
"	17	32	10	4	0.000	0.000	0.000	0.500
"	17	13	10	4	0.000	0.000	0.000	0.250

Movement Type	Activity Code	Segment Number	Speed (mph)	Duty Cycle Number	Non-ZTR Idle Time (hrs)	ZTR Idle Time (hrs)	Working Time - Final Train Building (hrs)	Fraction of Segment or Time Moving
"	17	14	10	4	0.000	0.000	0.000	0.250
"	17	14	10	4	0.000	0.000	0.000	0.250
"	17	13	10	4	0.000	0.000	0.000	0.250
"	17	32	10	4	0.250	0.250	0.000	0.250
"	17	-32	10	4	0.000	0.000	0.000	0.250
"	17	-13	10	4	0.000	0.000	0.000	0.500
"	17	-17	10	4	0.000	0.000	0.000	0.500
"	17	-18	10	4	0.000	0.000	0.000	0.250
"	17	33	10	4	0.000	0.000	0.000	0.500
"	17	34	10	4	0.000	0.000	0.000	0.500
"	17	35	10	4	0.000	0.000	0.000	0.500
"	17	13	10	4	0.000	0.000	0.000	0.250
"	17	14	10	4	0.000	0.000	0.000	0.250
"	17	14	10	4	0.000	0.000	0.000	0.250
"	17	13	10	4	0.000	0.000	0.000	0.250
"	17	35	10	4	0.250	0.250	0.000	0.250
"	17	-35	10	4	0.000	0.000	0.000	0.250
"	17	-13	10	4	0.000	0.000	0.000	0.500
"	17	-17	10	4	0.000	0.000	0.000	0.500
"	17	-18	10	4	0.000	0.000	0.000	0.250
EB West Colton Manifest Originating	18	18	10	5	0.000	0.000	1.500	0.000
"	18	-17	10	4	0.000	0.000	0.000	0.500
"	18	-13	10	4	0.000	0.000	0.000	0.500
"	18	-32	10	4	0.000	0.000	0.000	0.250
"	18	32	10	5	0.000	0.000	0.250	0.000
"	18	13	10	5	0.000	0.000	0.250	0.000
"	18	14	10	5	0.000	0.000	0.250	0.000
"	18	15	10	4	0.000	0.000	0.000	0.500
"	18	16	10	4	0.000	0.000	0.000	0.500
"	18	-17	10	4	0.000	0.000	0.000	0.500
"	18	-13	10	4	0.000	0.000	0.000	0.500
"	18	-35	10	4	0.000	0.000	0.000	0.250
"	18	35	10	5	0.000	0.000	0.250	0.000
"	18	13	10	5	0.000	0.000	0.250	0.000
"	18	14	10	5	0.000	0.000	0.250	0.000
"	18	15	10	4	0.000	0.000	0.000	0.500
"	18	16	10	4	0.000	0.000	0.000	0.500
WB West Colton Manifest Terminating	19	16	10	4	0.000	0.000	0.000	1.000
"	19	15	10	4	0.000	0.000	0.000	1.000
"	19	14	10	4	0.000	0.000	0.000	1.000
"	19	13	10	4	0.000	0.000	0.000	1.000
"	19	32	10	4	0.000	0.000	0.000	0.500
"	19	31	10	4	0.000	0.000	0.000	0.500
"	19	30	10	4	0.000	0.000	0.000	0.500
"	19	29	10	4	0.000	0.000	0.000	0.250
"	19	28	10	4	0.000	0.000	0.000	0.250
"	19	21	10	4	0.000	0.000	0.000	0.250
"	19	28	10	4	0.000	0.000	0.000	0.250
"	19	29	10	4	0.250	0.250	0.000	0.250
"	19	-30	10	4	0.000	0.000	0.000	0.250
"	19	-31	10	4	0.000	0.000	0.000	0.500
"	19	-32	10	4	0.000	0.000	0.000	0.500
"	19	-13	10	4	0.000	0.000	0.000	0.500
"	19	-17	10	4	0.000	0.000	0.000	0.500
"	19	-18	10	4	0.000	0.000	0.000	0.250
"	19	35	10	4	0.000	0.000	0.000	0.500
"	19	34	10	4	0.000	0.000	0.000	0.500
"	19	33	10	4	0.000	0.000	0.000	0.500
"	19	29	10	4	0.000	0.000	0.000	0.250
"	19	28	10	4	0.000	0.000	0.000	0.250
"	19	21	10	4	0.000	0.000	0.000	0.250
"	19	28	10	4	0.000	0.000	0.000	0.250
"	19	29	10	4	0.250	0.250	0.000	0.250
"	19	-33	10	4	0.000	0.000	0.000	0.250
"	19	-34	10	4	0.000	0.000	0.000	0.500
"	19	-35	10	4	0.000	0.000	0.000	0.500
"	19	-13	10	4	0.000	0.000	0.000	0.500
"	19	-17	10	4	0.000	0.000	0.000	0.500
"	19	-18	10	4	0.000	0.000	0.000	0.250

Movement Type	Activity Code	Segment Number	Speed (mph)	Duty Cycle Number	Non-ZTR Idle Time (hrs)	ZTR Idle Time (hrs)	Working Time - Final Train Building (hrs)	Fraction of Segment or Time Moving
WB West Colton Manifest Originating	20	18	10	5	0.000	0.000	1.500	0.000
"	20	-17	10	4	0.000	0.000	0.000	0.500
"	20	-13	10	4	0.000	0.000	0.000	0.500
"	20	-32	10	4	0.000	0.000	0.000	0.500
"	20	-31	10	4	0.000	0.000	0.000	0.500
"	20	-30	10	4	0.000	0.000	0.000	0.250
"	20	30	10	5	0.000	0.000	0.150	0.000
"	20	29	10	5	0.000	0.000	0.200	0.000
"	20	28	10	5	0.000	0.000	0.200	0.000
"	20	21	10	5	0.000	0.000	0.200	0.000
"	20	20	10	4	0.000	0.000	0.000	0.500
"	20	-17	10	4	0.000	0.000	0.000	0.500
"	20	-13	10	4	0.000	0.000	0.000	0.500
"	20	-35	10	4	0.000	0.000	0.000	0.500
"	20	-34	10	4	0.000	0.000	0.000	0.500
"	20	-33	10	4	0.000	0.000	0.000	0.250
"	20	33	10	5	0.000	0.000	0.150	0.000
"	20	29	10	5	0.000	0.000	0.200	0.000
"	20	28	10	5	0.000	0.000	0.200	0.000
"	20	21	10	5	0.000	0.000	0.200	0.000
"	20	20	10	4	0.000	0.000	0.000	0.500
EB Local Terminating (Alhambra Sub)	21	20	30	2	0.000	0.000	0.000	1.000
"	21	21	20	3	0.000	0.000	0.000	1.000
"	21	28	10	4	0.000	0.000	0.000	1.000
"	21	29	10	4	0.000	0.000	0.000	1.000
"	21	33	10	4	0.000	0.000	0.000	1.000
"	21	34	10	4	0.000	0.000	0.000	1.000
"	21	35	10	4	0.500	0.500	0.000	1.000
"	21	-13	10	4	0.000	0.000	0.000	1.000
"	21	-17	10	4	0.000	0.000	0.000	1.000
"	21	-18	10	4	0.000	0.000	0.000	0.500
EB Local Originating (Alhambra Sub)	22	18	10	5	0.000	0.000	1.000	0.000
"	22	-17	10	4	0.000	0.000	0.000	1.000
"	22	-13	10	4	0.000	0.000	0.000	1.000
"	22	35	10	5	0.000	0.000	0.500	0.000
"	22	13	10	4	0.000	0.000	0.000	1.000
"	22	14	10	4	0.000	0.000	0.000	1.000
"	22	15	10	4	0.000	0.000	0.000	1.000
"	22	16	10	4	0.000	0.000	0.000	1.000
WB Local Terminating (Alhambra Sub)	23	16	10	4	0.000	0.000	0.000	1.000
"	23	15	10	4	0.000	0.000	0.000	1.000
"	23	14	10	4	0.000	0.000	0.000	1.000
"	23	13	10	4	0.000	0.000	0.000	1.000
"	23	35	10	4	0.000	0.000	0.000	1.000
"	23	34	10	4	0.000	0.000	0.000	1.000
"	23	33	10	4	0.500	0.500	0.000	1.000
"	23	-33	10	4	0.000	0.000	0.000	1.000
"	23	-34	10	4	0.000	0.000	0.000	1.000
"	23	-35	10	4	0.000	0.000	0.000	1.000
"	23	-13	10	4	0.000	0.000	0.000	1.000
"	23	-17	10	4	0.000	0.000	0.000	1.000
"	23	-18	10	4	0.000	0.000	0.000	0.500
WB Local Originating (Alhambra Sub)	24	18	10	5	0.000	0.000	1.000	0.000
"	24	-17	10	4	0.000	0.000	0.000	1.000
"	24	-13	10	4	0.000	0.000	0.000	1.000
"	24	-35	10	4	0.000	0.000	0.000	1.000
"	24	-34	10	4	0.000	0.000	0.000	1.000
"	24	33	10	5	0.000	0.000	0.500	1.000
"	24	29	10	4	0.000	0.000	0.000	1.000
"	24	28	10	4	0.000	0.000	0.000	1.000
"	24	21	10	4	0.000	0.000	0.000	1.000
"	24	20	10	4	0.000	0.000	0.000	1.000
EB Local Terminating (Los Angeles Sub)	25	1	30	2	0.000	0.000	0.000	1.000
"	25	2	20	3	0.000	0.000	0.000	1.000
"	25	3	10	4	0.000	0.000	0.000	1.000
"	25	4	10	4	0.000	0.000	0.000	1.000
"	25	5	10	4	0.000	0.000	0.000	1.000
"	25	6	10	4	0.000	0.000	0.000	1.000
"	25	43	10	4	0.000	0.000	0.000	1.000

Movement Type	Activity Code	Segment Number	Speed (mph)	Duty Cycle Number	Non-ZTR Idle Time (hrs)	ZTR Idle Time (hrs)	Working Time - Final Train Building (hrs)	Fraction of Segment or Time Moving
"	25	44	10	4	0.000	0.000	0.000	1.000
"	25	40	10	4	0.000	0.000	0.000	1.000
"	25	41	10	4	0.000	0.000	0.000	1.000
"	25	42	10	4	0.000	0.000	0.000	1.000
"	25	29	10	4	0.000	0.000	0.000	1.000
"	25	33	10	4	0.000	0.000	0.000	1.000
"	25	34	10	4	0.000	0.000	0.000	1.000
"	25	35	10	4	0.000	0.000	0.000	1.000
"	25	-13	10	4	0.000	0.000	0.000	1.000
"	25	-17	10	4	0.000	0.000	0.000	1.000
"	25	-18	10	4	0.000	0.000	0.000	0.500
EB Local Originating (Los Angeles Sub)	26	18	10	5	0.000	0.000	1.000	0.000
"	26	-17	10	4	0.000	0.000	0.000	1.000
"	26	-13	10	4	0.000	0.000	0.000	1.000
"	26	-35	10	4	0.000	0.000	0.000	1.000
"	26	34	10	5	0.000	0.000	1.000	0.000
"	26	33	10	4	0.000	0.000	0.000	1.000
"	26	29	10	4	0.000	0.000	0.000	1.000
"	26	42	10	4	0.000	0.000	0.000	1.000
"	26	41	10	4	0.000	0.000	0.000	1.000
"	26	40	10	4	0.000	0.000	0.000	1.000
"	26	44	10	4	0.000	0.000	0.000	1.000
"	26	43	10	4	0.000	0.000	0.000	1.000
"	26	6	10	4	0.000	0.000	0.000	1.000
"	26	5	10	4	0.000	0.000	0.000	1.000
"	26	4	10	4	0.000	0.000	0.000	1.000
"	26	3	10	4	0.000	0.000	0.000	1.000
"	26	2	10	4	0.000	0.000	0.000	1.000
"	26	45	20	3	0.000	0.000	0.000	1.000
"	26	46	30	2	0.000	0.000	0.000	1.000
WB Local Terminating (Los Angeles Sub)	27	46	30	2	0.000	0.000	0.000	1.000
"	27	45	20	3	0.000	0.000	0.000	1.000
"	27	2	10	4	0.000	0.000	0.000	1.000
"	27	3	10	4	0.000	0.000	0.000	1.000
"	27	4	10	4	0.000	0.000	0.000	1.000
"	27	5	10	4	0.000	0.000	0.000	1.000
"	27	6	10	4	0.000	0.000	0.000	1.000
"	27	43	10	4	0.000	0.000	0.000	1.000
"	27	44	10	4	0.000	0.000	0.000	1.000
"	27	40	10	4	0.000	0.000	0.000	1.000
"	27	41	10	4	0.000	0.000	0.000	1.000
"	27	42	10	4	0.000	0.000	0.000	1.000
"	27	29	10	4	0.000	0.000	0.000	1.000
"	27	33	10	4	0.000	0.000	0.000	1.000
"	27	34	10	4	0.000	0.000	0.000	1.000
"	27	35	10	4	0.000	0.000	0.000	1.000
"	27	-13	10	4	0.000	0.000	0.000	1.000
"	27	-17	10	4	0.000	0.000	0.000	1.000
"	27	-18	10	4	0.000	0.000	0.000	0.500
WB Local Originating (Los Angeles Sub)	28	18	10	5	0.000	0.000	1.000	0.000
"	28	-17	10	4	0.000	0.000	0.000	1.000
"	28	-13	10	4	0.000	0.000	0.000	1.000
"	28	-35	10	4	0.000	0.000	0.000	1.000
"	28	34	10	5	0.000	0.000	1.000	0.000
"	28	33	10	4	0.000	0.000	0.000	1.000
"	28	29	10	4	0.000	0.000	0.000	1.000
"	28	42	10	4	0.000	0.000	0.000	1.000
"	28	41	10	4	0.000	0.000	0.000	1.000
"	28	40	10	4	0.000	0.000	0.000	1.000
"	28	44	10	4	0.000	0.000	0.000	1.000
"	28	43	10	4	0.000	0.000	0.000	1.000
"	28	6	10	4	0.000	0.000	0.000	1.000
"	28	5	10	4	0.000	0.000	0.000	1.000
"	28	4	10	4	0.000	0.000	0.000	1.000
"	28	3	10	4	0.000	0.000	0.000	1.000
"	28	2	10	4	0.000	0.000	0.000	1.000
"	28	45	10	4	0.000	0.000	0.000	1.000
"	28	46	10	5	0.000	0.000	1.000	0.000
"	28	45	10	4	0.000	0.000	0.000	1.000

Movement Type	Activity Code	Segment Number	Speed (mph)	Duty Cycle Number	Non-ZTR Idle Time (hrs)	ZTR Idle Time (hrs)	Working Time - Final Train Building (hrs)	Fraction of Segment or Time Moving
"	28	2	20	3	0.000	0.000	0.000	1.000
"	28	1	30	2	0.000	0.000	0.000	1.000
EB Power Moves Through (Alhambra Sub) without Setout	29	-20	50	1	0.000	0.000	0.000	1.000
"	29	-21	50	1	0.000	0.000	0.000	1.000
"	29	-22	50	1	0.000	0.000	0.000	1.000
"	29	-23	50	1	0.000	0.000	0.000	1.000
"	29	-24	50	1	0.000	0.000	0.000	1.000
"	29	-25	50	1	0.000	0.000	0.000	1.000
"	29	-26	50	1	0.000	0.000	0.000	1.000
"	29	-27	50	1	0.000	0.000	0.000	1.000
EB Power Moves Through (Alhambra Sub) with Setouts	30	-20	30	2	0.000	0.000	0.000	1.000
"	30	-21	20	3	0.000	0.000	0.000	1.000
"	30	-28	10	4	0.000	0.000	0.000	1.000
"	30	-29	10	4	0.000	0.000	0.000	1.000
"	30	-30	10	4	0.000	0.000	0.000	1.000
"	30	-31	10	4	0.000	0.000	0.000	1.000
"	30	-32	10	4	0.000	0.000	0.000	1.000
"	30	-13	10	4	0.000	0.000	0.000	1.000
"	30	-17	10	4	0.000	0.000	0.000	1.000
"	30	-18	10	4	0.000	0.500	0.000	1.000
"	30	-19	10	4	0.000	0.000	0.000	1.000
"	30	-16	10	4	0.000	0.000	0.000	1.000
WB Power Moves Through (Alhambra Sub) without Setou	31	-20	50	1	0.000	0.000	0.000	1.000
"	31	-21	50	1	0.000	0.000	0.000	1.000
"	31	-22	50	1	0.000	0.000	0.000	1.000
"	31	-23	50	1	0.000	0.000	0.000	1.000
"	31	-24	50	1	0.000	0.000	0.000	1.000
"	31	-25	50	1	0.000	0.000	0.000	1.000
"	31	-26	50	1	0.000	0.000	0.000	1.000
"	31	-27	50	1	0.000	0.000	0.000	1.000
WB Power Moves Through (Alhambra Sub) with Setouts	32	-20	30	2	0.000	0.000	0.000	1.000
"	32	-21	20	3	0.000	0.000	0.000	1.000
"	32	-28	10	4	0.000	0.000	0.000	1.000
"	32	-29	10	4	0.000	0.000	0.000	1.000
"	32	-30	10	4	0.000	0.000	0.000	1.000
"	32	-31	10	4	0.000	0.000	0.000	1.000
"	32	-32	10	4	0.000	0.000	0.000	1.000
"	32	-13	10	4	0.000	0.000	0.000	1.000
"	32	-17	10	4	0.000	0.000	0.000	1.000
"	32	-18	10	4	0.000	0.500	0.000	1.000
"	32	-19	10	4	0.000	0.000	0.000	1.000
"	32	-16	10	4	0.000	0.000	0.000	1.000
EB Power Moves Through (Los Angeles Sub)	33	-1	50	1	0.000	0.000	0.000	1.000
"	33	-2	50	1	0.000	0.000	0.000	1.000
"	33	-45	50	1	0.000	0.000	0.000	1.000
"	33	-46	50	1	0.000	0.000	0.000	1.000
WB Power Moves Through (Los Angeles Sub)	35	-1	50	1	0.000	0.000	0.000	1.000
"	35	-2	50	1	0.000	0.000	0.000	1.000
"	35	-45	50	1	0.000	0.000	0.000	1.000
"	35	-46	50	1	0.000	0.000	0.000	1.000
EB Power Moves Terminating	37	-20	30	2	0.000	0.000	0.000	1.000
"	37	-21	20	3	0.000	0.000	0.000	1.000
"	37	-28	10	4	0.000	0.000	0.000	1.000
"	37	-29	10	4	0.000	0.000	0.000	1.000
"	37	-30	10	4	0.000	0.000	0.000	1.000
"	37	-31	10	4	0.000	0.000	0.000	1.000
"	37	-32	10	4	0.000	0.000	0.000	1.000
"	37	-13	10	4	0.000	0.000	0.000	1.000
"	37	-17	10	4	0.000	0.000	0.000	1.000
"	37	-18	10	4	0.000	0.000	0.000	0.500
EB Power Moves Originating	38	-16	10	4	0.000	0.000	0.000	1.000
"	38	-19	10	4	0.000	0.000	0.000	1.000
"	38	-18	10	4	0.000	0.000	0.000	0.500
WB Power Moves Terminating	39	-16	10	4	0.000	0.000	0.000	1.000
"	39	-19	10	4	0.000	0.000	0.000	1.000
"	39	-18	10	4	0.000	0.000	0.000	0.500
WB Power Moves Originating	40	-20	30	2	0.000	0.000	0.000	1.000
"	40	-21	20	3	0.000	0.000	0.000	1.000
"	40	-28	10	4	0.000	0.000	0.000	1.000

Movement Type	Activity Code	Segment Number	Speed (mph)	Duty Cycle Number	Non-ZTR Idle Time (hrs)	ZTR Idle Time (hrs)	Working Time - Final Train Building (hrs)	Fraction of Segment or Time Moving
"	40	-29	10	4	0.000	0.000	0.000	1.000
"	40	-30	10	4	0.000	0.000	0.000	1.000
"	40	-31	10	4	0.000	0.000	0.000	1.000
"	40	-32	10	4	0.000	0.000	0.000	1.000
"	40	-13	10	4	0.000	0.000	0.000	1.000
"	40	-17	10	4	0.000	0.000	0.000	1.000
"	40	-18	10	4	0.000	0.000	0.000	0.500

Notes

(1) Segment numbers listed as negative values are in-yard power moves from arriving trains to service or from service to departing trains
(2) Non-ZTR Idling is the duration of an idle event when units without ZTR continue to idle after ZTR-equipped units have shut down
(3) Idling All is the duration of idling during which all locomotives continue to idle
(4) Fraction of Segment Moving is the fraction of the length of the segment over which the movement occurs or the fraction of events moving on this route
(5) Negative activity code values indicate an activity and segment where setout idling occurs

Yard Operations	Activity Code	Segment Number	Duty Cycle Number	Non-ZTR Idle Time (hrs)	ZTR Idle Time (hrs)	Fraction of Working Time
A Yard Switching	41	47	6	0	0	0.3
Intermodal Track and Bowl Yard Switching	41	48	6	0	0	0.25
Switching between A Yard/Bowl and Marne	41	49	6	0	0	0.1
Marne Yard Switching	41	50	6	0	0	0.25
East Marne to Fullerton Switching	41	16	6	0	0	0.1

Duty Cycles (Percent of Time by Notch)	Duty Cycle Number	Idle	DB	N1	N2	N3	N4	N5	N6	N7	N8
Through Trains	1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%
Setouts Approach #1	2	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Setouts Approach #2	3	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
In Yard	4	0.0%	0.0%	50.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Road Power Train Building	5	20.0%	0.0%	40.0%	40.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Yard Switching	6	59.8%	0.0%	12.4%	12.3%	5.8%	3.6%	3.6%	1.5%	0.2%	0.8%

Emission Factors Weighted by Model/Tier/ZTR Fractions - DPM g/hr per Locomotive

Locomotive Model Group	Group ID	Idle-NonZTR	Idle-All	DB	N1	N2	N3	N4	N5	N6	N7	N8
California Fuel (221 ppm S)												
Service	1	9.53	22.73	55.2	50.27	126.27	237.59	279.46	339.99	459.06	538.28	605.62
LoadTest	2	12.68	21.9	56.67	51.41	123.74	229.58	267.15	307.37	406	467.53	539.89
47-State Fuel (2639 ppm S)												
Service	1	9.53	22.73	55.2	50.27	126.27	238.64	280.85	341.84	461.66	541.89	609.85
LoadTest	2	12.68	21.9	56.67	51.41	123.74	230.65	268.47	309.01	408.34	470.99	544.17

Note: Idle-NonZTR is the average per-locomotive idle emission rate for the fraction of locomotives not equipped with ZTR/Auto start-stop technology

Service and Shop Activity

			Duration of Activity per Locomotive (minutes)										
Activity	Number of Locomotives	Fraction of Calif. Fuel	Idle-NonZTR	Idle-All	DB	N1	N2	N3	N4	N5	N6	N7	N8
Service Events	121	0.00	0	60	0	0	0	0	0	0	0	0	0
Unscheduled Mtc Post Test	28	0.90	0	5	0	0	0	0	0	0	0	0	10

Locomotive Model Distributions

Locomotives Serviced Technology	ZTR/AESS	Switcher	GP-3x	GP-4x	SD-50	GP-60	SD-7x	SD-90	Dash 7	Dash 8	Dash 9	C-60
Pre Tier 0	**No**	0.0000	0.0000	0.0531	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pre Tier 0	**Yes**	0.0000	0.0113	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 0	**No**	0.0000	0.0000	0.0368	0.0000	0.0355	0.0520	0.0031	0.0000	0.0374	0.0631	0.0000
Tier 0	**Yes**	0.0000	0.0253	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	**No**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	**Yes**	0.0000	0.0014	0.0000	0.0000	0.0000	0.0512	0.0000	0.0000	0.0000	0.0211	0.0000
Tier 2	**No**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 2	**Yes**	0.0000	0.0007	0.0000	0.0000	0.0000	0.3112	0.0000	0.0000	0.0000	0.2968	0.0000

Locomotives Load Tested Technology	ZTR/AESS	Switcher	GP-3x	GP-4x	SD-50	GP-60	SD-7x	SD-90	Dash 7	Dash 8	Dash 9	C-60
Pre Tier 0	**No**	0.0000	0.0000	0.0356	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pre Tier 0	**Yes**	0.0000	0.0079	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 0	**No**	0.0000	0.0000	0.0246	0.0000	0.0446	0.0491	0.0000	0.0000	0.0652	0.0711	0.0000
Tier 0	**Yes**	0.0000	0.0177	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	**No**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 1	**Yes**	0.0000	0.0010	0.0000	0.0000	0.0000	0.0484	0.0000	0.0000	0.0000	0.0238	0.0000
Tier 2	**No**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tier 2	**Yes**	0.0000	0.0005	0.0000	0.0000	0.0000	0.3079	0.0000	0.0000	0.0000	0.3028	0.0000

Example 1 -- EB Departing Intermodal Trains

Parameter	Value
Activity Code	10
Number of Events	686
Locomotives per Consist on Train	2.985
Number of Setouts	0
Locomotives per Consist Working During Power Moves	1.5
Emission Factor Group	2
Fraction of California Fuel	0.90

Route Followed	Activity Code	Segment Number	Length (miles)	Speed (mph)	Duty Cycle	Power Move	Non-ZTR Idle (hrs)	ZTR Idle (hrs)	Working Time - Final Train Building (hrs)	Fraction of Segment Moving	Locomotive Hours Moving (Duty Cycle 4)	Locomotive Hours Working (Duty Cycle 5)	Locomotive Hours NonZTR Idle	Locomotive Hours ZTR Idle
Consist Preparation:														
Marne South Track	10	18	0.2811	10	5	N	0	0	1.5	0	0.00	3071.57	0.00	0.00
A Yard Departures:														
West Marne to Marne South Track	10	-17	0.1554	10	4	Y	0	0	0	0.5	7.99	0.00	0.00	0.00
East Bowl to Mid Yard	10	-13	0.2799	10	4	Y	0	0	0	0.5	14.40	0.00	0.00	0.00
A Yard East Middle	10	-32	0.3275	10	4	Y	0	0	0	0.25	8.42	0.00	0.00	0.00
A Yard East Middle	10	32	0.3275	10	5	N	0	0	0.25	0	0.00	511.93	0.00	0.00
East Bowl to Mid Yard	10	13	0.2799	10	5	N	0	0	0.25	0	0.00	511.93	0.00	0.00
Mid Yard to West Marne	10	14	0.2851	10	5	N	0	0	0.25	0	0.00	511.93	0.00	0.00
Marne North Track	10	15	0.2851	10	4	N	0	0	0	0.5	29.19	0.00	0.00	0.00
East Marne to Fullerton	10	16	0.6980	10	4	N	0	0	0	0.5	71.47	0.00	0.00	0.00
Marne Yard Departures:														
Marne South Track to East Marne	10	-19	0.1401	10	4	Y	0	0	0	0.5	7.21	0.00	0.00	0.00
Marne South Track to East Marne	10	-19	0.1401	10	4	Y	0	0	0	0.25	3.60	0.00	0.00	0.00
Marne South Track to East Marne	10	19	0.1401	10	5	N	0	0	0.1	0	0.00	204.77	0.00	0.00
East Marne to Fullerton	10	16	0.6980	10	5	N	0	0	0.65	0	0.00	1331.01	0.00	0.00

Note: EB intermodal departures are from both the A Yard (50%) and the Marne Yard (50%)

Total											*142.29*	*6143.13*	*0.00*	*0.00*

Emission Factors	Group ID	Idle-NonZTR	Idle-All	DB	N1	N2	N3	N4	N5	N6	N7	N8
Departing IM Trains - CA Fuel	2	6.7	20.6	50.5	50.2	122.9	240.2	286.1	346.6	478.5	559.5	614.2
Departing IM Trains - 47-State Fuel	2	6.7	20.6	50.5	50.2	122.9	241.3	287.5	348.5	481.2	563.1	618.5
CA Fuel Fraction Adjusted Rates		*6.7*	*20.6*	*50.5*	*50.2*	*122.9*	*240.3*	*286.2*	*346.8*	*478.8*	*559.8*	*614.6*

	Duty Cycle											
Duty Cycle Moving	4	0.00	0.00	0.00	0.50	0.50	0.00	0.00	0.00	0.00	0.00	0.00
Duty Cycle Working	5	0.20	0.20	0.00	0.40	0.40	0.00	0.00	0.00	0.00	0.00	0.00
Weighted g/hr emissions	4	0.00	0.00	0.00	25.10	61.45	0.00	0.00	0.00	0.00	0.00	0.00
	5	1.34	4.12	0.00	20.08	49.16	0.00	0.00	0.00	0.00	0.00	0.00

	Moving (Duty Cycle 4)	Working (Duty Cycle 5)	Idle-NonZTR	Idle-All
Emission Rate (g/hr)	86.54	74.69	6.69	20.59
Locomotive Hours	142.29	6143.13	0.00	0.00
Total Emissions (g/yr)	**12314**	**458818**	**0**	**0**

Example 2 -- Unscheduled Maintenance Load Testing

Number of Unscheduled Maintenance Load Tests	28											
Fraction of Calif. Fuel	0.90											
Emission Factors (g/hr)	**Group ID**	**Idle-NonZTR**	**Idle-All**	**DB**	**N1**	**N2**	**N3**	**N4**	**N5**	**N6**	**N7**	**N8**
Load Test - CA Fuel	2	12.68	21.90	56.67	51.41	123.74	229.58	267.15	307.37	406.00	467.53	539.89
Load Test - 47-State Fuel	2	12.68	21.9	56.67	51.41	123.74	230.65	268.47	309.01	408.34	470.99	544.17
CA Fuel Fraction Adjusted Rates		*12.68*	*21.90*	*56.67*	*51.41*	*123.74*	*229.69*	*267.28*	*307.53*	*406.23*	*467.88*	*540.32*

		Duration (minutes)										
Activity	**Number of Locomotives**	**Idle-NonZTR**	**Idle-All**	**DB**	**N1**	**N2**	**N3**	**N4**	**N5**	**N6**	**N7**	**N8**
Unscheduled Mtc Post Test	28	0	5	0	0	0	0	0	0	0	0	10
Emissions (g)												
Notch-Specific		0.0	51.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2521.5

Total Emissions (g/yr)	**2573**

DRAYAGE TRUCKS

Summary of Emissions from Intermodal Drayage Trucks
City of Industry Rail Yard, City of Industry, California

Running Exhaust Emissions

Number of Truck Trips	VMT per Trip	VMT per Year	2005 Emission Factors (g/mi)					Emissions (tpy)				
			ROG	CO	NOx	DPM	SOx	ROG	CO	NOx	DPM	SOx
299,009	1.6	478,414.00	6.40	17.23	28.68	2.47	0.24	3.38	9.09	15.13	1.30	0.13

Idling Exhaust Emissions

Number of Truck Trips	Idling		2005 Emission Factors (g/hr)					Emissions (tpy)				
	(mins/trip)	(hr/yr)	ROG	CO	NOx	DPM	SOx	ROG	CO	NOx	DPM	SOx
299,009	30	149,504.38	16.163	52.988	100.383	2.845	0.550	2.66	8.73	16.54	0.47	0.09

Notes:

1. Number of truck trips calculated from UPRR provided gate counts. The total gate counts were increased by 25% to account for bobtail trucks (trucks without a chassie or trailer and trucks with an empty chassie).
2. VMT per trip engineering estimate from site visit.
3. PM10 emission factor includes exhaust as well as brake wear and tire wear.
4. Emission factor calculations assumed an average speed of 15 mph.

Summary of Emissions from Intermodal Drayage Trucks
City of Industry Rail Yard, City of Industry, California

Running Exhaust Emissions

Number of Truck Trips	VMT per Trip	VMT per Year	2007 Emission Factors (g/mi)					Emissions (tpy)				
			ROG	CO	NOx	DPM	SOx	ROG	CO	NOx	DPM	SOx
273,741	1.6	437,986.00	5.97	15.71	27.03	2.07	0.03	2.88	7.58	13.05	1.00	0.01

Idling Exhaust Emissions

Number of Truck Trips	Idling		2007 Emission Factors (g/hr)					Emissions (tpy)				
	(mins/trip)	(hr/yr)	ROG	CO	NOx	DPM	SOx	ROG	CO	NOx	DPM	SOx
273,741	30	136,870.63	14.570	51.001	104.615	2.358	0.063	2.20	7.69	15.78	0.36	0.01

Notes:

1. Number of truck trips calculated from UPRR provided gate counts. The total gate counts were increased by 25% to account for bobtail trucks (trucks without a chassie or trailer and trucks with an empty chassie).
2. VMT per trip engineering estimate from site visit.
3. PM10 emission factor includes exhaust as well as brake wear and tire wear.
4. Emission factor calculations assumed an average speed of 15 mph.

Summary of Emissions from Intermodal Drayage Trucks
City of Industry Rail Yard, City of Industry, California

Running Exhaust Emissions

Number of Truck Trips	VMT per Trip	VMT per Year	2010 Emission Factors (g/mi)					Emissions (tpy)				
			ROG	CO	NOx	DPM	SOx	ROG	CO	NOx	DPM	SOx
282,036	1.6	451,257.41	4.93	12.58	22.54	1.52	0.03	2.45	6.26	11.21	0.75	0.01

Idling Exhaust Emissions

Number of Truck Trips	Idling		2010 Emission Factors (g/hr)					Emissions (tpy)				
	(mins/trip)	(hr/yr)	ROG	CO	NOx	DPM	SOx	ROG	CO	NOx	DPM	SOx
282,036	30	141,017.94	12.487	48.291	110.258	1.792	0.063	1.94	7.51	17.14	0.28	0.01

Notes:

1. Number of truck trips calculated from UPRR provided gate counts. The total gate counts were increased by 25% to account for bobtail trucks (trucks without a chassie or trailer and trucks with an empty chassie).
2. VMT per trip engineering estimate from site visit.
3. PM10 emission factor includes exhaust as well as brake wear and tire wear.
4. Emission factor calculations assumed an average speed of 15 mph.

Summary of Emissions from Intermodal Drayage Trucks
City of Industry Rail Yard, City of Industry, California

Running Exhaust Emissions

Number of Truck Trips	VMT per Trip	VMT per Year	2015 Emission Factors (g/mi)					Emissions (tpy)				
			ROG	CO	NOx	DPM	SOx	ROG	CO	NOx	DPM	SOx
296,423	1.6	474,276.08	2.86	7.01	12.55	0.68	0.03	1.49	3.67	6.56	0.36	0.01

Idling Exhaust Emissions

Number of Truck Trips	Idling		2015 Emission Factors (g/hr)					Emissions (tpy)				
	(mins/trip)	(hr/yr)	ROG	CO	NOx	DPM	SOx	ROG	CO	NOx	DPM	SOx
296,423	30	148,211.27	9.892	44.707	117.379	1.002	0.063	1.62	7.30	19.18	0.16	0.01

Notes:

1. Number of truck trips calculated from UPRR provided gate counts. The total gate counts were increased by 25% to account for bobtail trucks (trucks without a chassie or trailer and trucks with an empty chassie).
2. VMT per trip engineering estimate from site visit.
3. PM10 emission factor includes exhaust as well as brake wear and tire wear.
4. Emission factor calculations assumed an average speed of 15 mph.

Summary of Emissions from Intermodal Drayage Trucks
City of Industry Rail Yard, City of Industry, California

Running Exhaust Emissions

Number of Truck Trips	VMT per Trip	VMT per Year	2020 Emission Factors (g/mi)					Emissions (tpy)				
			ROG	CO	NOx	DPM	SOx	ROG	CO	NOx	DPM	SOx
311,543	1.6	498,468.92	1.72	4.12	7.98	0.29	0.03	0.94	2.26	4.38	0.16	0.02

Idling Exhaust Emissions

Number of Truck Trips	Idling		2020 Emission Factors (g/hr)					Emissions (tpy)				
	(mins/trip)	(hr/yr)	ROG	CO	NOx	DPM	SOx	ROG	CO	NOx	DPM	SOx
311,543	30	155,771.54	8.569	42.794	121.000	0.525	0.063	1.47	7.35	20.78	0.09	0.01

Notes:

1. Number of truck trips calculated from UPRR provided gate counts. The total gate counts were increased by 25% to account for bobtail trucks (trucks without a chassie or trailer and trucks with an empty chassie).
2. VMT per trip engineering estimate from site visit.
3. PM10 emission factor includes exhaust as well as brake wear and tire wear.
4. Emission factor calculations assumed an average speed of 15 mph.

CARGO HANDLING EQUIPMENT AND HEAVY EQUIPMENT

Summary of Emissions from Cargo Handling Equipment
City of Industry Rail Yard, City of Industry, CA

Equipment	Equipment			Engine	Engine		Rating	No. of	Annual Hours	Load	2005 Emission Factors (g/bhp-hr)[2]						2005 Emission Estimates (tpy)					
Type	ID	Make	Model	Make	Model	Year	(hp)	Units	of Operation[1]	Factor[2,3]	HC	CO	NOx	PM10	DPM	SOx	HC	CO	NOx	PM10	DPM	SOx
Top Pick	87764	Cat	V250	Cat	3218	1977	250	1	1095	0.59	1.230	6.172	14.936	0.858	0.858	0.060	0.219	1.099	2.659	0.153	0.153	0.011
RTG	98451	Mi Jack	1000R	Detroit	671NA	1984	300	1	0	0.43	NA	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000
RTG	99152	Mi Jack	1000R	Detroit	671NA	1991	300	1	6570	0.43	0.669	3.263	8.928	0.444	0.444	0.052	0.625	3.048	8.341	0.415	0.415	0.049
RTG	99153	Mi Jack	1000R	Detroit	671NA	1991	300	1	3285	0.43	0.669	3.263	8.928	0.444	0.444	0.052	0.313	1.524	4.170	0.207	0.207	0.024
Top Pick	89583	Taylor	TEC-950	Cummins	L-10	1995	350	1	1095	0.59	0.621	3.113	8.573	0.402	0.402	0.060	0.155	0.776	2.137	0.100	0.100	0.015
Chassie Stacker	69588	Taylor	GT210	Perkins	10006-6t	1999	154	1	*4380*	0.30	0.538	2.851	6.862	0.360	0.360	0.060	0.120	0.636	1.531	0.080	0.080	0.013
RTG	90405	Taylor	6040	Detroit	DDEC	2004	300	1	6570	0.43	0.091	0.946	4.162	0.097	0.097	0.052	0.085	0.883	3.888	0.091	0.091	0.049
Forklift	Unk	Taylor	T300M "Big Red"	Cummins	5.9BT	2005	160	1	1000	0.30	0.25	2.83	4.32	0.15	0.15	0.06	0.013	0.150	0.229	0.008	0.008	0.003
Backhoe	MoW	John Deere	S-310	Unknown	Unknown	Fleet Avg	*108*	1	1825	0.55	1.14	3.26	6.82	0.56	0.56	0.05	0.136	0.389	0.816	0.067	0.067	0.006
Yard Hostlers	32006	Ottawa	Commando	Cummins	6BT	2003	150	2	6570	0.20	0.263	2.862	5.248	0.230	0.230	0.060	0.114	1.244	2.281	0.100	0.100	0.026
Yard Hostlers	42160	Ottawa	Commando	Cummins	6BT	2004	150	3	6570	0.20	0.169	2.808	4.631	0.173	0.173	0.060	0.110	1.830	3.019	0.113	0.113	0.039
Yard Hostlers	52002	Ottawa	Commando	Cummins	6BT	2005	150	9	6570	0.20	0.119	2.754	4.283	0.139	0.139	0.060	0.233	5.385	8.375	0.271	0.271	0.117
CHE Total								**21**									**1.974**	**16.425**	**36.400**	**1.531**	**1.531**	**0.342**
HE Total								**2**									**0.150**	**0.539**	**1.044**	**0.075**	**0.075**	**0.009**

Notes:

Summary of Emissions from Cargo Handling Equipment
City of Industry Rail Yard, City of Industry, CA

Equipment	Equipment			Engine	Engine		Rating	CHE Rule	No. of	Annual Hours	Load	2007 Emission Factors (g/bhp-hr)[3]						2007 Emission Estimates (tpy)					
Type	ID	Make	Model	Make	Model	Year	(hp)	Compliance Deadline	Units	of Operation[1]	Factor[2]	HC	CO	NOx	PM10	DPM	SOx	HC	CO	NOx	PM10	DPM	SOx
Top Pick	87764	Cat	V250	Cat	3218	1977	250	Retired in 2005	1	0	0.59	NA	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000
RTG	98451	Mi Jack	1000R	Detroit	671NA	1984	300	Retired in 2005	1	0	0.43	NA	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000
RTG	99152	Mi Jack	1000R	Detroit	671NA	1991	300	12/31/2008	1	6,288	0.43	0.669	3.263	8.928	0.444	0.444	0.052	0.598	2.917	7.983	0.397	0.397	0.047
RTG	99153	Mi Jack	1000R	Detroit	671NA	1991	300	12/31/2008	1	3,144	0.43	0.669	3.263	8.928	0.444	0.444	0.052	0.299	1.459	3.992	0.199	0.199	0.023
Container Handler	69301	Taylor	TEC-155H	Cummins	5.9	1993	150	12/31/2008	1	*6,570*	0.59	0.579	2.981	8.290	0.367	0.367	0.060	0.371	1.911	5.313	0.235	0.235	0.038
Top Pick	89583	Taylor	TEC-950	Cummins	L-10	1995	350	Removed from Yard	0	0	0.59	NA	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000
Chassis Stacker	69588	Taylor	GT210	Perkins	10006-6t	1999	154	12/31/2009	1	4,192	0.30	0.538	2.851	6.862	0.360	0.360	0.060	0.115	0.609	1.465	0.077	0.077	0.013
RTG	90405	Taylor	6040	Detroit	DDEC	2004	300	12/31/2010	1	6,288	0.43	0.091	0.946	4.162	0.097	0.097	0.052	0.081	0.846	3.721	0.087	0.087	0.047
Container Handler	60507	Fantuzzi	MJ7.5S	Cummins	QSC-8.3	2005	275	12/31/2010	1	*6,570*	0.59	0.091	0.946	4.162	0.097	0.097	0.052	0.106	1.111	4.890	0.114	0.114	0.061
Forklift	60503	Taylor	T300M "Big Red"	Cummins	5.9BT	2005	160	12/31/2010	1	957	0.30	0.25	2.83	4.32	0.15	0.15	0.06	0.013	0.143	0.219	0.008	0.008	0.003
Backhoe	MoW	John Deere	S-310	Unknown	Unknown	Fleet Avg	*108*	Removed from Yard	0	0	0.55	NA	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000
Yard Hostlers	32006	Ottawa	Commando	Cummins	6BT	2003	150	12/31/2010	2	6,288	0.20	0.263	2.862	5.248	0.230	0.230	0.060	0.109	1.190	2.183	0.096	0.096	0.025
Yard Hostlers	42160	Ottawa	Commando	Cummins	6BT	2004	150	12/31/2011	3	6,288	0.20	0.169	2.808	4.631	0.173	0.173	0.060	0.106	1.752	2.889	0.108	0.108	0.037
Yard Hostlers	52002	Ottawa	Commando	Cummins	6BT	2005	150	12/31/2012	3	6,288	0.20	0.119	2.754	4.283	0.139	0.139	0.060	0.074	1.718	2.672	0.087	0.087	0.037
Yard Hostlers	52002	Ottawa	Commando	Cummins	6BT	2005	150	12/31/2013	2	6,288	0.20	0.119	2.754	4.283	0.139	0.139	0.060	0.050	1.145	1.781	0.058	0.058	0.025
Yard Hostlers	52002	Ottawa	Commando	Cummins	6BT	2005	150	12/31/2014	4	6,288	0.20	0.119	2.754	4.283	0.139	0.139	0.060	0.099	2.291	3.562	0.115	0.115	0.050
CHE Total									**22**									**2.009**	**16.948**	**40.452**	**1.572**	**1.572**	**0.403**
HE Total									**1**									**0.013**	**0.143**	**0.219**	**0.008**	**0.008**	**0.003**

Notes:
1. The hours of operation are equal to the 2005 hours of operation x (2007 lift count/2005 lift count).

Summary of Emissions from Cargo Handling Equipment
City of Industry Rail Yard, City of Industry, CA

Equipment	Equipment			Engine	Engine		Rating	CHE Rule	No. of	Annual Hours	Load	2010 Emission Factors (g/bhp-hr)[3]						2010 Emission Estimates (tpy)					
Type	ID	Make	Model	Make	Model	Year	(hp)	Compliance Deadline	Units	of Operation[1]	Factor[2]	HC	CO	NOx	PM10	DPM	SOx	HC	CO	NOx	PM10	DPM	SOx
Top Pick	87764	Cat	V250	Cat	3218	1977	250	Retired in 2005	0	0	0.59	NA	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000
RTG	98451	Mi Jack	1000R	Detroit	671NA	1984	300	Retired in 2005	0	0	0.43	NA	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000
RTG	99152	Mi Jack	1000R	Detroit	671NA	1991	300	Retiring in 2008	0	0	0.43	NA	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000
RTG	99153	Mi Jack	1000R	Detroit	671NA	1991	300	Retiring in 2008	0	0	0.43	NA	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000
Container Handler	69301	Taylor	TEC-155H	Cummins	5.9	1993	150	12/31/2008	1	6,769	0.59	0.579	2.981	8.290	0.184	0.184	0.060	0.382	1.968	5.474	0.121	0.121	0.040
Top Pick	89583	Taylor	TEC-950	Cummins	L-10	1995	350	Removed from Yard	0	0	0.59	NA	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000
Chassis Stacker	69588	Taylor	GT210	Perkins	10006-6t	1999	154	12/31/2009	1	4,319	0.30	0.538	2.851	6.862	0.180	0.180	0.060	0.118	0.627	1.509	0.040	0.040	0.013
RTG	90405	Taylor	6040	Detroit	DDEC	2004	300	12/31/2010	1	6,479	0.43	0.091	0.946	4.162	0.097	0.097	0.052	0.083	0.871	3.834	0.090	0.090	0.048
Container Handler	60507	Fantuzzi	MJ7.5S	Cummins	QSC-8.3	2005	275	12/31/2010	1	6,769	0.59	0.091	0.946	4.162	0.097	0.097	0.052	0.110	1.145	5.039	0.118	0.118	0.063
Forklift	60503	Taylor	T300M "Big Red"	Cummins	5.9BT	2005	160	12/31/2010	1	986	0.30	0.25	2.83	4.32	0.149	0.15	0.06	0.013	0.148	0.225	0.008	0.008	0.003
Backhoe	MoW	John Deere	S-310	Unknown	Unknown	Fleet Avg	*108*	Removed from Yard	0	0	0.55	NA	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000
RTG					Tier 3	2008	*350*	At Purchase	1	*4,977*	0.43	0.000	2.600	3.000	0.023	0.023	0.060	0.000	2.147	2.477	0.019	0.019	0.050
RTG					Tier 3	2008	*350*	At Purchase	1	*4,977*	0.43	0.000	2.600	3.000	0.023	0.023	0.060	0.000	2.147	2.477	0.019	0.019	0.050
Yard Hostlers	32006	Ottawa	Commando	Cummins	6BT	2003	150	12/31/2010	2	6,479	0.20	0.263	2.862	5.248	0.230	0.230	0.060	0.113	1.226	2.249	0.098	0.098	0.026
Yard Hostlers	42160	Ottawa	Commando	Cummins	6BT	2004	150	12/31/2011	3	6,479	0.20	0.169	2.808	4.631	0.173	0.173	0.060	0.109	1.805	2.977	0.111	0.111	0.038
Yard Hostlers	52002	Ottawa	Commando	Cummins	6BT	2005	150	12/31/2012	3	6,479	0.20	0.119	2.754	4.283	0.139	0.139	0.060	0.077	1.770	2.753	0.089	0.089	0.038
Yard Hostlers	52002	Ottawa	Commando	Cummins	6BT	2005	150	12/31/2013	2	6,479	0.20	0.119	2.754	4.283	0.139	0.139	0.060	0.051	1.180	1.835	0.059	0.059	0.026
Yard Hostlers	52002	Ottawa	Commando	Cummins	6BT	2005	150	12/31/2014	4	6,479	0.20	0.119	2.754	4.283	0.139	0.139	0.060	0.102	2.360	3.670	0.119	0.119	0.051
CHE Total									**20**									**1.145**	**17.246**	**34.294**	**0.883**	**0.883**	**0.442**
HE Total									**1**									**0.013**	**0.148**	**0.225**	**0.008**	**0.008**	**0.003**

Notes:
1. The hours of operation are equal to the 2005 hours of operation x (2010 predicted lift count/2005 lift count).

Summary of Emissions from Cargo Handling Equipment
City of Industry Rail Yard, City of Industry, CA

Equipment	Equipment			Engine	Engine		Rating	CHE Rule	No. of	Annual Hours	Load	2015 Emission Factors (g/bhp-hr)[3]						2015 Emission Estimates (tpy)					
Type	ID	Make	Model	Make	Model	Year	(hp)	Compliance Deadline	Units	of Operation[1]	Factor[2]	HC	CO	NOx	PM10	DPM	SOx	HC	CO	NOx	PM10	DPM	SOx
Top Pick	87764	Cat	V250	Cat	3218	1977	250	Retired in 2005	0	0	0.59	NA	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000
RTG	98451	Mi Jack	1000R	Detroit	671NA	1984	300	Retired in 2005	0	0	0.43	NA	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000
RTG	99152	Mi Jack	1000R	Detroit	671NA	1991	300	Retiring in 2008	0	0	0.43	NA	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000
RTG	99153	Mi Jack	1000R	Detroit	671NA	1991	300	Retiring in 2008	0	0	0.43	NA	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000
Container Handler	69301	Taylor	TEC-155H	Cummins	5.9	1993	150	12/31/2008	1	7,114	0.59	0.579	2.981	8.290	0.184	0.184	0.060	0.402	2.069	5.753	0.127	0.127	0.042
Top Pick	89583	Taylor	TEC-950	Cummins	L-10	1995	350	Removed from Yard	0	0	0.59	NA	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000
Chassis Stacker	69588	Taylor	GT210	Perkins	10006-6t	1999	154	12/31/2009	1	4,540	0.30	0.538	2.851	6.862	0.180	0.180	0.060	0.124	0.659	1.586	0.042	0.042	0.014
RTG	90405	Taylor	6040	Detroit	DDEC	2004	300	12/31/2010	1	6,809	0.43	0.091	0.946	4.162	0.049	0.049	0.052	0.088	0.916	4.030	0.047	0.047	0.050
Container Handler	60507	Fantuzzi	MJ7.5S	Cummins	QSC-8.3	2005	275	12/31/2010	1	7,114	0.59	0.091	0.946	4.162	0.049	0.049	0.052	0.115	1.203	5.296	0.062	0.062	0.066
Forklift	60503	Taylor	T300M "Big Red"	Cummins	5.9BT	2005	160	12/31/2010	1	1,036	0.30	0.25	2.83	4.32	0.074	0.07	0.06	0.014	0.155	0.237	0.004	0.004	0.003
Backhoe	MoW	John Deere	S-310	Unknown	Unknown	Fleet Avg	*108*	Removed from Yard	0	0	0.55	NA	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000
RTG					Tier 3	2008	*350*	At Purchase	1	*5,231*	0.43	0.000	2.600	3.000	0.023	0.023	0.060	0.000	2.256	2.603	0.020	0.020	0.052
RTG					Tier 3	2008	*350*	At Purchase	1	*5,231*	0.43	0.000	2.600	3.000	0.023	0.023	0.060	0.000	2.256	2.603	0.020	0.020	0.052
Yard Hostlers	32006	Ottawa	Commando	Cummins	6BT	2003	150	12/31/2010	2	6,809	0.20	0.263	2.862	5.248	0.010	0.010	0.060	0.118	1.289	2.364	0.005	0.005	0.027
Yard Hostlers	42160	Ottawa	Commando	Cummins	6BT	2004	150	12/31/2011	3	6,809	0.20	0.169	2.808	4.631	0.010	0.010	0.060	0.114	1.897	3.129	0.007	0.007	0.040
Yard Hostlers	52002	Ottawa	Commando	Cummins	6BT	2005	150	12/31/2012	3	6,809	0.20	0.119	2.754	4.283	0.010	0.010	0.060	0.081	1.860	2.893	0.007	0.007	0.040
Yard Hostlers	52002	Ottawa	Commando	Cummins	6BT	2005	150	12/31/2013	2	6,809	0.20	0.119	2.754	4.283	0.010	0.010	0.060	0.054	1.240	1.929	0.005	0.005	0.027
Yard Hostlers	52002	Ottawa	Commando	Cummins	6BT	2005	150	12/31/2014	4	6,809	0.20	0.119	2.754	4.283	0.010	0.139	0.060	0.107	2.481	3.858	0.009	0.125	0.054
CHE Total									**20**									**1.203**	**18.126**	**36.043**	**0.348**	**0.464**	**0.465**
HE Total									**1**									**0.014**	**0.155**	**0.237**	**0.004**	**0.004**	**0.003**

Notes:
1. The hours of operation are equal to the 2005 hours of operation x (2015 predicted lift count/2005 lift count).

Summary of Emissions from Cargo Handling Equipment
City of Industry Rail Yard, City of Industry, CA

Equipment	Equipment			Engine	Engine		Rating	CHE Rule	No. of	Annual Hours	Load	2020 Emission Factors (g/bhp-hr)[3]						2020 Emission Estimates (tpy)					
Type	ID	Make	Model	Make	Model	Year	(hp)	Compliance Deadline	Units	of Operation[1]	Factor[2]	HC	CO	NOx	PM10	DPM	SOx	HC	CO	NOx	PM10	DPM	SOx
Top Pick	87764	Cat	V250	Cat	3218	1977	250	Retired in 2005	0	0	0.59	NA	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000
RTG	98451	Mi Jack	1000R	Detroit	671NA	1984	300	Retired in 2005	0	0	0.43	NA	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000
RTG	99152	Mi Jack	1000R	Detroit	671NA	1991	300	Retiring in 2008	0	0	0.43	NA	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000
RTG	99153	Mi Jack	1000R	Detroit	671NA	1991	300	Retiring in 2008	0	0	0.43	NA	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000
Container Handler	69301	Taylor	TEC-155H	Cummins	5.9	1993	150	12/31/2008	1	7,477	0.59	0.579	2.981	8.290	0.184	0.184	0.060	0.422	2.174	6.047	0.134	0.134	0.044
Top Pick	89583	Taylor	TEC-950	Cummins	L-10	1995	350	Removed from Yard	0	0	0.59	NA	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000
Chassis Stacker	69588	Taylor	GT210	Perkins	10006-6t	1999	154	12/31/2009	1	4,771	0.30	0.538	2.851	6.862	0.180	0.180	0.060	0.131	0.693	1.667	0.044	0.044	0.015
RTG	90405	Taylor	6040	Detroit	DDEC	2004	300	12/31/2010	1	7,157	0.43	0.091	0.946	4.162	0.049	0.049	0.052	0.092	0.962	4.235	0.049	0.049	0.053
Container Handler	60507	Fantuzzi	MJ7.5S	Cummins	QSC-8.3	2005	275	12/31/2010	1	7,477	0.59	0.091	0.946	4.162	0.049	0.049	0.052	0.121	1.265	5.566	0.065	0.065	0.070
Forklift	60503	Taylor	T300M "Big Red"	Cummins	5.9BT	2005	160	12/31/2010	1	1,089	0.30	0.25	2.83	4.32	0.074	0.07	0.06	0.014	0.163	0.249	0.004	0.004	0.003
Backhoe	MoW	John Deere	S-310	Unknown	Unknown	Fleet Avg	*108*	Removed from Yard	0	0	0.55	NA	NA	NA	NA	NA	NA	0.000	0.000	0.000	0.000	0.000	0.000
RTG					Tier 3	2008	*350*	At Purchase	1	*5,497*	0.43	0.000	2.600	3.000	0.023	0.023	0.060	0.000	2.371	2.736	0.021	0.021	0.055
RTG					Tier 3	2008	*350*	At Purchase	1	*5,497*	0.43	0.000	2.600	3.000	0.023	0.023	0.060	0.000	2.371	2.736	0.021	0.021	0.055
Yard Hostlers	32006	Ottawa	Commando	Cummins	6BT	2003	150	12/31/2010	2	7,157	0.20	0.263	2.862	5.248	0.010	0.010	0.060	0.124	1.355	2.484	0.005	0.005	0.028
Yard Hostlers	42160	Ottawa	Commando	Cummins	6BT	2004	150	12/31/2011	3	7,157	0.20	0.169	2.808	4.631	0.010	0.010	0.060	0.120	1.994	3.288	0.007	0.007	0.042
Yard Hostlers	52002	Ottawa	Commando	Cummins	6BT	2005	150	12/31/2012	3	7,157	0.20	0.119	2.754	4.283	0.010	0.010	0.060	0.085	1.955	3.041	0.007	0.007	0.042
Yard Hostlers	52002	Ottawa	Commando	Cummins	6BT	2005	150	12/31/2013	2	7,157	0.20	0.119	2.754	4.283	0.010	0.010	0.060	0.056	1.304	2.027	0.005	0.005	0.028
Yard Hostlers	52002	Ottawa	Commando	Cummins	6BT	2005	150	12/31/2014	4	7,157	0.20	0.119	2.754	4.283	0.010	0.139	0.060	0.113	2.607	4.054	0.009	0.131	0.057
CHE Total									**20**									**1.265**	**19.051**	**37.882**	**0.366**	**0.488**	**0.488**
HE Total									**1**									**0.014**	**0.163**	**0.249**	**0.004**	**0.004**	**0.003**

Notes:
1. The hours of operation are equal to the 2005 hours of operation x (2020 predicted lift count/2005 lift count).

Summary of Emissions from Diesel-Fueled Heavy Equipment
City of Industry Rail Yard, City of Industry, CA

Equipment Owner	Equipment Type	Fuel Type	Make	Model	Engine Make	Engine Model	Model Year[4]	Rating (hp)[4]	No of Units	Annual Hours of Operation[1]	Load Factor[2]	2005 Emission Factors (g/hp-hr)[3]						2005 Emission Estimates (tpy)					
												ROG	CO	NOx	PM10	DPM	SOx	VOC	CO	NOx	PM10	DPM	SOx
TTX	Forklift (12,000 lb)	Diesel	Caterpillar	DP70	Mitsubishi	S-6-S	1997	92.5	2	730	0.30	1.85	4.60	10.39	0.97	0.97	0.06	0.08	0.21	0.46	0.04	0.04	0.00
TTX	Forklift (8,000 lb)	Diesel	Caterpillar	DP-40D	Caterpillar	Unknown	1999	84	1	730	0.30	1.85	4.60	8.36	1.06	1.06	0.06	0.04	0.09	0.17	0.02	0.02	0.00
TTX	Forklift (6,000 lb)	Diesel	Caterpillar	R-80	Caterpillar	Unknown	1989	56.5	1	365	0.30	1.85	4.60	10.39	0.97	0.97	0.06	0.01	0.03	0.07	0.01	0.01	0.00
Total									**4**									**0.13**	**0.33**	**0.70**	**0.07**	**0.07**	**0.00**

Notes
1. Hours of operation estimated by UPRR staff.
2. Default load factors from OFFROAD2007 model.
3. Emission factors from OFFROAD2007 model.

TRUs AND REEFER CARS

Summary of Emissions from Transport Refrigeration Units and Refrigerated Railcars
City of Industry Rail Yard, City of Industry, CA

TRU Equip Type	Average Rating (hp)[1]	Fuel Type	Average No. Units in Yard[2]	Hours of Operation (hr/day)[3]	Hours of Operation (hr/yr)[4]	Load Factor[5]	2005 Emission Factors (g/hp-hr)[6] HC	CO	NOx	DPM	SOx	VOC Evaporative Emission Factors[6] Part 1 (lb/hr)	Part 2 (lb/yr)	Emissions (tpy) HC	CO	NOx	DPM	SOx
Container	28.56	Diesel	10	4	1,460	0.56	2.85	6.78	6.43	0.71	0.07	-	-	0.73	1.74	1.65	0.18	0.02
Railcar	34	Diesel	4	4	1,460	0.53	3.23	7.49	6.71	0.79	0.07	-	-	0.38	0.87	0.78	0.09	0.01
Total			**14**		**2,920**									**1.11**	**2.61**	**2.43**	**0.27**	**0.03**

Notes:

1. Based on the average horsepower distribution in the OFFROAD 2006 model.
2. UPRR staff estimate that there are 3-5 TRUs and 0-2 reefer cars and in the Yard at any given time. To be conservative, these estimates were increased by 100%.
3. From CARB's Staff Report: ISOR, ATCM for TRUs, Section V.a.2.
4. It was assumed that the number of units and the annual hours of operations remains constant, with individual units cycling in and out of the yard.
5. Load factors are the default factors from the OFFROAD 2006 model.
6. Emission factors from OFFROAD 2006 model.
7. Evaporative emissions are negligible.

Summary of Emissions from Transport Refrigeration Units and Refrigerated Railcars
City of Industry Rail Yard, City of Industry, CA

TRU Equip Type	Average Rating (hp)[1]	Fuel Type	Average No. Units in Yard[2]	Hours of Operation (hr/day)[3]	Hours of Operation (hr/yr)[4]	Load Factor[5]	2007 Emission Factors (g/hp-hr)[6] HC	CO	NOx	DPM	SOx	VOC Evaporative Emission Factors[6, 7] Part 1 (g/hr)	Part 2 (g/yr)	Emissions (tpy) HC	CO	NOx	DPM	SOx
Container	28.56	Diesel	10	4	1,460	0.56	2.85	6.78	6.43	0.71	0.07	-	-	0.731	1.737	1.647	0.183	0.018
Railcar	34	Diesel	4	4	1,460	0.53	3.23	7.49	6.71	0.79	0.07	-	-	0.375	0.868	0.778	0.091	0.008
Total			**14**		**2,920**									**1.11**	**2.61**	**2.43**	**0.27**	**0.03**

Notes:

1. Based on the average horsepower distribution in the OFFROAD2006 model.
2. Number of TRUs in yard is equal to 2005 TRUs x (2007 lift count/2005 lift count).
3. From CARB's Staff Report: ISOR, ATCM for TRUs, Section V.a.2.
4. It was assumed that the number of units and the annual hours of operations remains constant, with individual units cycling in and out of the yard.
5. Load factors are the default factors from the OFFROAD 2006 model.
6. Emission factors from OFFROAD2006 model.
7. Evaporative emissions are negligible.

Summary of Emissions from Transport Refrigeration Units and Refrigerated Railcars
City of Industry Rail Yard, City of Industry, CA

TRU Equip Type	Average Rating (hp)[1]	Fuel Type	Average No. Units in Yard[2]	Hours of Operation (hr/day)[3]	Hours of Operation (hr/yr)[4]	Load Factor[5]	2010 Emission Factors (g/hp-hr)[6] HC	CO	NOx	DPM	SOx	VOC Evaporative Emission Factors[6, 7] Part 1 (g/hr)	Part 2 (g/yr)	Emissions (tpy) HC	CO	NOx	DPM	SOx
Container	28.56	Diesel	10	4	1,460	0.56	2.85	6.78	6.43	0.22	0.07	-	-	0.731	1.737	1.647	0.056	0.018
Railcar	34	Diesel	4	4	1,460	0.53	3.23	7.49	6.71	0.22	0.07	-	-	0.375	0.868	0.778	0.026	0.008
Total			**14**		**2,920**									**1.11**	**2.61**	**2.43**	**0.08**	**0.03**

Notes:

1. Based on the average horsepower distribution in the OFFROAD2006 model.
2. Number of TRUs in yard is equal to 2005 TRUs x (Predicted 2010 lift count/2005 lift count).
3. From CARB's Staff Report: ISOR, ATCM for TRUs, Section V.a.2.
4. It was assumed that the number of units and the annual hours of operations remains constant, with individual units cycling in and out of the yard.
5. Load factors are the default factors from the OFFROAD 2006 model.
6. DPM emission factor from TRU ATCM, Table 3.
7. Evaporative emissions are negligible.

Summary of Emissions from Transport Refrigeration Units and Refrigerated Railcars
City of Industry Rail Yard, City of Industry, CA

TRU Equip Type	Average Rating (hp)[1]	Fuel Type	Average No. Units in Yard[2]	Hours of Operation (hr/day)[3]	Hours of Operation (hr/yr)[4]	Load Factor[5]	2015 Emission Factors (g/hp-hr)[6] HC	CO	NOx	DPM	SOx	VOC Evaporative Emission Factors[6, 7] Part 1 (g/hr)	Part 2 (g/yr)	Emissions (tpy) HC	CO	NOx	DPM	SOx
Container	28.56	Diesel	11	4	1,460	0.56	2.85	6.78	6.43	0.02	0.07	-	-	0.804	1.911	1.811	0.006	0.019
Railcar	34	Diesel	5	4	1,460	0.53	3.23	7.49	6.71	0.02	0.07	-	-	0.469	1.086	0.973	0.003	0.010
Total			**16**		**2,920**									**1.27**	**3.00**	**2.78**	**0.01**	**0.03**

Notes:

1. Based on the average horsepower distribution in the OFFROAD2006 model.
2. Number of TRUs in yard is equal to 2005 TRUs x (Predicted 2015 lift count/2005 lift count).
3. From CARB's Staff Report: ISOR, ATCM for TRUs, Section V.a.2.
4. It was assumed that the number of units and the annual hours of operations remains constant, with individual units cycling in and out of the yard.
5. Load factors are the default factors from the OFFROAD 2006 model.
6. DPM emission factor from TRU ATCM, Table 3 - ULETRU factor was used.
7. Evaporative emissions are negligible.

Summary of Emissions from Transport Refrigeration Units and Refrigerated Railcars
City of Industry Rail Yard, City of Industry, CA

TRU Equip Type	Average Rating (hp)[1]	Fuel Type	Average No. Units in Yard[2]	Hours of Operation (hr/day)[3]	Hours of Operation (hr/yr)[4]	Load Factor[5]	2020 Emission Factors (g/hp-hr)[6] HC	CO	NOx	DPM	SOx	VOC Evaporative Emission Factors[6, 7] Part 1 (g/hr)	Part 2 (g/yr)	Emissions (tpy) HC	CO	NOx	DPM	SOx
Container	28.56	Diesel	11	4	1,460	0.56	2.85	6.78	6.43	0.02	0.07	-	-	0.804	1.911	1.811	0.006	0.019
Railcar	34	Diesel	5	4	1,460	0.53	3.23	7.49	6.71	0.02	0.07	-	-	0.469	1.086	0.973	0.003	0.010
Total			**16**		**2,920**									**1.27**	**3.00**	**2.78**	**0.01**	**0.03**

Notes:

1. Based on the average horsepower distribution in the OFFROAD2006 model.
2. Number of TRUs in yard is equal to 2005 TRUs x (Predicted 2020 lift count/2005 lift count).
3. From CARB's Staff Report: ISOR, ATCM for TRUs, Section V.a.2.
4. It was assumed that the number of units and the annual hours of operations remains constant, with individual units cycling in and out of the yard.
5. Load factors are the default factors from the OFFROAD 2006 model.
6. DPM emission factor from TRU ATCM, Table 3 - ULETRU factor was used.
7. Evaporative emissions are negligible.

OTHER ON-ROAD TRUCKS

Summary of Emissions from Diesel-Fueled Yard Trucks
City of Industry Rail Yard, City of Industry, CA

Running Exhaust Emissions

Equipment Type	Equipment ID/Owner	Make	Model	Year	Vehicle Class	VMT (mi/yr)[1]	2005 Emission Factors (g/mi)[2,3]						2005 Emissions Estimates (tpy)					
							ROG	CO	NOx	PM10[4]	DPM[4]	SOx	ROG	CO	NOx	PM10	DPM	SOx
Boom Truck	UP65629	International	4900	1992	HHD	10,584	8.25	20.27	32.16	3.92	3.78	0.27	0.10	0.24	0.38	0.05	0.04	0.00
Welder Truck	65984	Ford	F-800	1992	MHD	17,065	0.94	9.70	18.46	1.25	1.25	0.16	0.02	0.18	0.35	0.02	0.02	0.00
Boom Truck	UP 68842	Ford	F-Series	1997	HHD	13,767	6.92	16.99	31.05	2.34	2.26	0.24	0.10	0.26	0.47	0.04	0.03	0.00
Gang Truck	60099	Freightliner	Unknown	1999	HHD	13,556	5.84	14.32	30.22	2.02	1.94	0.25	0.09	0.21	0.45	0.03	0.03	0.00
Flat Bed Truck	TTX	Isuzu	NPR HD	2000	HHD	8,973	5.24	12.87	29.54	1.88	1.81	0.23	0.05	0.13	0.29	0.02	0.02	0.00
Flat Bed Truck	TTX	Chevy	W-4500	2001	HHD	6,714	4.60	11.29	28.80	1.73	1.66	0.24	0.03	0.08	0.21	0.01	0.01	0.00
Flat Bed Truck	TTX	Isuzu	NPR HD	2001	HHD	5,795	4.60	11.29	28.80	1.73	1.66	0.24	0.03	0.07	0.18	0.01	0.01	0.00
Truck	TTX	Ford	F350	2001	LHDT1	9,282	0.39	1.58	8.68	0.13	0.13	0.16	0.00	0.02	0.09	0.00	0.00	0.00
Truck	TTX	Ford	F250	2001	MHD	21,556	0.37	3.16	12.93	0.43	0.43	0.13	0.01	0.08	0.31	0.01	0.01	0.00
Flat Bed Truck	TTX	Chevy	W-4500	2003	HHD	10,065	1.50	3.48	18.89	0.52	0.46	0.23	0.02	0.04	0.21	0.01	0.01	0.00
Total													**0.45**	**1.30**	**2.94**	**0.19**	**0.19**	**0.03**

Idling Exhaust Emissions

Equipment Type	Equip. ID	Make	Model	Model Year	Vehicle Class	Idling[5]		2005 Emission Factors (g/hr)[6]						2005 Emissions Estimates (tpy)					
						(min/day)	(hr/yr)	ROG	CO	NOx	PM10	DPM	SOx	ROG	CO	NOx	PM10	DPM	SOx
Boom Truck	UP65629	International	4900	1992	HHD	15	91	15.52	53.81	101.42	2.57	2.57	0.55	0.00	0.01	0.01	0.00	0.00	0.00
Welder Truck	65984	Ford	F-800	1992	MHD	15	91	3.17	26.30	75.05	1.40	1.40	0.34	0.00	0.00	0.01	0.00	0.00	0.00
Boom Truck	UP 68842	Ford	F-Series	1997	HHD	15	91	12.41	49.53	110.27	1.93	1.93	0.55	0.00	0.00	0.01	0.00	0.00	0.00
Gang Truck	60099	Freightliner	Unknown	1999	HHD	15	91	9.31	44.51	119.08	1.33	1.33	0.55	0.00	0.00	0.01	0.00	0.00	0.00
Flat Bed Truck	TTX	Isuzu	NPR HD	2000	HHD	15	91	9.31	44.51	119.08	1.33	1.33	0.55	0.00	0.00	0.01	0.00	0.00	0.00
Flat Bed Truck	TTX	Chevy	W-4500	2001	HHD	15	91	9.31	44.51	119.08	1.33	1.33	0.55	0.00	0.00	0.01	0.00	0.00	0.00
Flat Bed Truck	TTX	Isuzu	NPR HD	2001	HHD	15	91	9.31	44.51	119.08	1.33	1.33	0.55	0.00	0.00	0.01	0.00	0.00	0.00
Truck	TTX	Ford	F350	2001	LHDT1	15	91	3.17	26.30	75.05	0.75	0.75	0.34	0.00	0.00	0.01	0.00	0.00	0.00
Truck	TTX	Ford	F250	2001	MHD	15	91	3.17	26.30	75.05	0.75	0.75	0.34	0.00	0.00	0.01	0.00	0.00	0.00
Flat Bed Truck	TTX	Chevy	W-4500	2003	HHD	15	91	7.65	41.43	123.52	1.03	1.03	0.55	0.00	0.00	0.01	0.00	0.00	0.00
Total														**0.01**	**0.04**	**0.10**	**0.00**	**0.00**	**0.00**

Notes:
1. Annual VMT estimated based on the vehicle age and odometer reading.
2. Running exhaust emissions calculated using the EMFAC2007 model with the BURDEN output option.
3. Running exhaust emission factor calculations assumed an average speed of 15 mph.
4. The PM10 emission factor includes engine exhaust emissions along with brake and tire wear. The DPM emission factor includes engine exhaust emissions only.
5. Idling time (hr/yr) is an engineering estimate based on discussions with UPRR staff.
6. Idling exhaust emissions factors calculated using the EMFAC2007 model with the EMFAC output option.

Summary of Emissions from Diesel-Fueled Yard Trucks
City of Industry Rail Yard, City of Industry, CA

Running Exhaust Emissions

Equipment Type	Equipment ID/Owner	Make	Model	Year	Vehicle Class	VMT (mi/yr)[1]	2007 Emission Factors (g/mi)[2,3]						2007 Emissions Estimates (tpy)					
							ROG	CO	NOx	PM10[4]	DPM[4]	SOx	ROG	CO	NOx	PM10	DPM	SOx
Boom Truck	UP65629	International	4900	1992	HHD	10,584	8.73	21.59	32.73	3.90	3.90	0.04	0.10	0.25	0.38	0.05	0.05	0.00
Welder Truck	65984	Ford	F-800	1992	MHD	17,065	1.07	10.67	19.21	1.33	1.33	0.04	0.02	0.20	0.36	0.03	0.03	0.00
Boom Truck	UP 68842	Ford	F-Series	1997	HHD	13,767	7.83	19.19	31.90	2.47	2.40	0.04	0.12	0.29	0.48	0.04	0.04	0.00
Gang Truck	60099	Freightliner	Unknown	1999	HHD	13,556	6.90	16.91	31.35	2.20	2.12	0.03	0.10	0.25	0.47	0.03	0.03	0.00
Flat Bed Truck	TTX	Isuzu	NPR HD	2000	HHD	8,973	5.24	12.87	29.54	1.88	1.81	0.23	0.05	0.13	0.29	0.02	0.02	0.00
Flat Bed Truck	TTX	Chevy	W-4500	2001	HHD	6,714	5.85	14.32	30.19	1.93	1.86	0.03	0.04	0.11	0.22	0.01	0.01	0.00
Flat Bed Truck	TTX	Isuzu	NPR HD	2001	HHD	5,795	5.85	14.32	30.19	1.93	1.86	0.03	0.04	0.09	0.19	0.01	0.01	0.00
Truck	TTX	Ford	F350	2001	LHDT1	9,282	0.39	1.97	8.68	0.48	0.48	0.03	0.00	0.02	0.09	0.00	0.00	0.00
Truck	TTX	Ford	F250	2001	MHD	21,556	0.48	3.96	13.08	0.48	0.48	0.03	0.01	0.09	0.31	0.01	0.01	0.00
Flat Bed Truck	TTX	Chevy	W-4500	2003	HHD	10,065	2.01	4.73	20.37	0.60	0.53	0.04	0.02	0.05	0.23	0.01	0.01	0.00
Total													**0.51**	**1.49**	**3.03**	**0.21**	**0.20**	**0.01**

Idling Exhaust Emissions

Equipment Type	Equip. ID	Make	Model	Model Year	Vehicle Class	Idling[5]		2007 Emission Factors (g/hr)[6]						2007 Emissions Estimates (tpy)					
						(min/day)	(hr/yr)	ROG	CO	NOx	PM10	DPM	SOx	ROG	CO	NOx	PM10	DPM	SOx
Boom Truck	UP65629	International	4900	1992	HHD	15	91	16.82	74.36	96.40	3.01	3.01	0.06	0.00	0.01	0.01	0.00	0.00	0.00
Welder Truck	65984	Ford	F-800	1992	MHD	15	91	3.17	26.30	75.05	1.34	1.34	0.04	0.00	0.00	0.01	0.00	0.00	0.00
Boom Truck	UP 68842	Ford	F-Series	1997	HHD	15	91	13.46	68.44	104.82	2.26	2.26	0.06	0.00	0.01	0.01	0.00	0.00	0.00
Gang Truck	60099	Freightliner	Unknown	1999	HHD	15	91	10.10	61.52	113.19	1.56	1.56	0.06	0.00	0.01	0.01	0.00	0.00	0.00
Flat Bed Truck	TTX	Isuzu	NPR HD	2000	HHD	15	91	10.10	61.52	113.19	1.56	1.56	0.06	0.00	0.01	0.01	0.00	0.00	0.00
Flat Bed Truck	TTX	Chevy	W-4500	2001	HHD	15	91	10.10	61.52	113.19	1.56	1.56	0.06	0.00	0.01	0.01	0.00	0.00	0.00
Flat Bed Truck	TTX	Isuzu	NPR HD	2001	HHD	15	91	10.10	61.52	113.19	1.56	1.56	0.06	0.00	0.01	0.01	0.00	0.00	0.00
Truck	TTX	Ford	F350	2001	LHDT1	15	91	3.17	26.30	75.05	0.72	0.72	0.04	0.00	0.00	0.01	0.00	0.00	0.00
Truck	TTX	Ford	F250	2001	MHD	15	91	3.17	26.30	75.05	0.72	0.72	0.04	0.00	0.00	0.01	0.00	0.00	0.00
Flat Bed Truck	TTX	Chevy	W-4500	2003	HHD	15	91	8.30	57.25	117.41	1.21	1.21	0.06	0.00	0.01	0.01	0.00	0.00	0.00
Total														**0.01**	**0.05**	**0.10**	**0.00**	**0.00**	**0.00**

Notes:
1. The 2005 baseline annual VMT estimated based on the vehicle age and odometer reading. Assumed no change from the 2005 baseline
2. Running exhaust emissions calculated using the EMFAC2007 model with the BURDEN output option.
3. Running exhaust emission factor calculations assumed an average speed of 15 mph.
4. The PM10 emission factor includes engine exhaust emissions along with brake and tire wear. The DPM emission factor includes engine exhaust emissions only.
5. Idling time (hr/yr) is an engineering estimate based on discussions with UPRR staff.
6. Idling exhaust emissions factors calculated using the EMFAC2007 model with the EMFAC output option.

Summary of Emissions from Diesel-Fueled Yard Trucks
City of Industry Rail Yard, City of Industry, CA

Running Exhaust Emissions

Equipment Type	Equipment ID/Owner	Make	Model	Year	Vehicle Class	VMT (mi/yr)[1]	2010 Emission Factors (g/mi)[2,3]						2010 Emissions Estimates (tpy)					
							ROG	CO	NOx	PM10[4]	DPM[4]	SOx	ROG	CO	NOx	PM10	DPM	SOx
Boom Truck	UP65629	International	4900	1992	HHD	10,584	9.41	23.11	33.38	4.11	4.11	0.05	0.11	0.27	0.39	0.05	0.05	0.00
Welder Truck	65984	Ford	F-800	1992	MHD	17,065	1.18	11.04	18.93	1.18	1.18	0.05	0.02	0.21	0.36	0.02	0.02	0.00
Boom Truck	UP 68842	Ford	F-Series	1997	HHD	13,767	8.92	21.83	32.96	2.77	2.67	0.05	0.14	0.33	0.50	0.04	0.04	0.00
Gang Truck	60099	Freightliner	Unknown	1999	HHD	13,556	8.16	20.06	32.74	2.47	2.41	0.03	0.12	0.30	0.49	0.04	0.04	0.00
Flat Bed Truck	TTX	Isuzu	NPR HD	2000	HHD	8,973	7.79	19.11	32.35	2.40	2.31	0.03	0.08	0.19	0.32	0.02	0.02	0.00
Flat Bed Truck	TTX	Chevy	W-4500	2001	HHD	6,714	7.35	18.07	31.86	2.30	2.23	0.04	0.05	0.13	0.24	0.02	0.02	0.00
Flat Bed Truck	TTX	Isuzu	NPR HD	2001	HHD	5,795	7.35	18.07	31.86	2.30	2.23	0.04	0.05	0.12	0.20	0.01	0.01	0.00
Truck	TTX	Ford	F350	2001	LHDT1	9,282	0.55	2.20	8.80	0.60	0.54	0.04	0.01	0.02	0.09	0.01	0.01	0.00
Truck	TTX	Ford	F250	2001	MHD	21,556	0.60	5.05	13.40	0.60	0.54	0.04	0.01	0.12	0.32	0.01	0.01	0.00
Flat Bed Truck	TTX	Chevy	W-4500	2003	HHD	10,065	2.74	63.20	22.37	0.72	0.69	0.04	0.03	0.70	0.25	0.01	0.01	0.00
Total													**0.62**	**2.39**	**3.15**	**0.23**	**0.23**	**0.01**

Idling Exhaust Emissions

Equipment Type	Equip. ID	Make	Model	Model Year	Vehicle Class	Idling[5]		2010 Emission Factors (g/hr)[6]						2010 Emissions Estimates (tpy)					
						(min/day)	(hr/yr)	ROG	CO	NOx	PM10	DPM	SOx	ROG	CO	NOx	PM10	DPM	SOx
Boom Truck	UP65629	International	4900	1992	HHD	15	91	15.52	53.81	101.42	2.47	2.47	0.06	0.00	0.01	0.01	0.00	0.00	0.00
Welder Truck	65984	Ford	F-800	1992	MHD	15	91	3.17	26.30	75.05	1.34	1.34	0.04	0.00	0.00	0.01	0.00	0.00	0.00
Boom Truck	UP 68842	Ford	F-Series	1997	HHD	15	91	12.41	49.53	110.27	1.85	1.85	0.06	0.00	0.00	0.01	0.00	0.00	0.00
Gang Truck	60099	Freightliner	Unknown	1999	HHD	15	91	9.31	44.51	119.08	1.28	1.28	0.06	0.00	0.00	0.01	0.00	0.00	0.00
Flat Bed Truck	TTX	Isuzu	NPR HD	2000	HHD	15	91	9.31	44.51	119.08	1.28	1.28	0.06	0.00	0.00	0.01	0.00	0.00	0.00
Flat Bed Truck	TTX	Chevy	W-4500	2001	HHD	15	91	9.31	44.51	119.08	1.28	1.28	0.06	0.00	0.00	0.01	0.00	0.00	0.00
Flat Bed Truck	TTX	Isuzu	NPR HD	2001	HHD	15	91	9.31	44.51	119.08	1.28	1.28	0.06	0.00	0.00	0.01	0.00	0.00	0.00
Truck	TTX	Ford	F350	2001	LHDT1	15	91	3.17	26.30	75.05	0.72	0.72	0.04	0.00	0.00	0.01	0.00	0.00	0.00
Truck	TTX	Ford	F250	2001	MHD	15	91	3.17	26.30	75.05	0.72	0.72	0.04	0.00	0.00	0.01	0.00	0.00	0.00
Flat Bed Truck	TTX	Chevy	W-4500	2003	HHD	15	91	7.65	41.43	123.52	0.99	0.99	0.06	0.00	0.00	0.01	0.00	0.00	0.00
Total														**0.01**	**0.04**	**0.10**	**0.00**	**0.00**	**0.00**

Notes:
1. The 2005 baseline annual VMT estimated based on the vehicle age and odometer reading. Assumed no change from the 2005 baseline
2. Running exhaust emissions calculated using the EMFAC2007 model with the BURDEN output option.
3. Running exhaust emission factor calculations assumed an average speed of 15 mph.
4. The PM10 emission factor includes engine exhaust emissions along with brake and tire wear. The DPM emission factor includes engine exhaust emissions only.
5. Idling time (hr/yr) is an engineering estimate based on discussions with UPRR staff.
6. Idling exhaust emissions factors calculated using the EMFAC2007 model with the EMFAC output option.

Summary of Emissions from Diesel-Fueled Yard Trucks
City of Industry Rail Yard, City of Industry, CA

Running Exhaust Emissions

Equipment Type	Equipment ID/Owner	Make	Model	Year	Vehicle Class	VMT (mi/yr)[1]	2015 Emission Factors (g/mi)[2,3]						2015 Emissions Estimates (tpy)					
							ROG	CO	NOx	PM10[4]	DPM[4]	SOx	ROG	CO	NOx	PM10	DPM	SOx
Boom Truck	UP65629	International	4900	1992	HHD	10,584	10.03	24.83	33.90	4.30	4.30	0.05	0.12	0.29	0.40	0.05	0.05	0.00
Welder Truck	65984	Ford	F-800	1992	MHD	17,065	0.82	12.37	18.97	1.65	1.65	0.05	0.02	0.23	0.36	0.03	0.03	0.00
Boom Truck	UP 68842	Ford	F-Series	1997	HHD	13,767	10.19	24.86	34.05	3.02	3.02	0.05	0.15	0.38	0.52	0.05	0.05	0.00
Gang Truck	60099	Freightliner	Unknown	1999	HHD	13,556	9.68	23.72	34.47	2.82	2.76	0.05	0.14	0.35	0.52	0.04	0.04	0.00
Flat Bed Truck	TTX	Isuzu	NPR HD	2000	HHD	8,973	9.42	23.14	34.16	2.76	2.70	0.05	0.09	0.23	0.34	0.03	0.03	0.00
Flat Bed Truck	TTX	Chevy	W-4500	2001	HHD	6,714	9.14	22.48	33.92	2.71	2.64	0.05	0.07	0.17	0.25	0.02	0.02	0.00
Flat Bed Truck	TTX	Isuzu	NPR HD	2001	HHD	5,795	9.14	22.48	33.92	2.71	2.64	0.05	0.06	0.14	0.22	0.02	0.02	0.00
Truck	TTX	Ford	F350	2001	LHDT1	9,282	0.86	3.02	9.07	0.71	0.71	0.05	0.01	0.03	0.09	0.01	0.01	0.00
Truck	TTX	Ford	F250	2001	MHD	21,556	0.71	6.52	13.76	0.71	0.71	0.05	0.02	0.16	0.33	0.02	0.02	0.00
Flat Bed Truck	TTX	Chevy	W-4500	2003	HHD	10,065	3.58	8.39	24.81	0.93	0.80	0.54	0.04	0.09	0.28	0.01	0.01	0.01
Total													**0.72**	**2.07**	**3.28**	**0.27**	**0.26**	**0.01**

Idling Exhaust Emissions

Equipment Type	Equip. ID	Make	Model	Model Year	Vehicle Class	Idling[5]		2015 Emission Factors (g/hr)[6]						2015 Emissions Estimates (tpy)					
						(min/day)	(hr/yr)	ROG	CO	NOx	PM10	DPM	SOx	ROG	CO	NOx	PM10	DPM	SOx
Boom Truck	UP65629	International	4900	1992	HHD	15	91	15.52	53.81	101.42	2.47	2.47	0.06	0.00	0.01	0.01	0.00	0.00	0.00
Welder Truck	65984	Ford	F-800	1992	MHD	15	91	3.17	26.30	75.05	1.34	1.34	0.04	0.00	0.00	0.01	0.00	0.00	0.00
Boom Truck	UP 68842	Ford	F-Series	1997	HHD	15	91	12.41	49.53	110.27	1.85	1.85	0.06	0.00	0.00	0.01	0.00	0.00	0.00
Gang Truck	60099	Freightliner	Unknown	1999	HHD	15	91	9.31	44.51	119.08	1.28	1.28	0.06	0.00	0.00	0.01	0.00	0.00	0.00
Flat Bed Truck	TTX	Isuzu	NPR HD	2000	HHD	15	91	9.31	44.51	119.08	1.28	1.28	0.06	0.00	0.00	0.01	0.00	0.00	0.00
Flat Bed Truck	TTX	Chevy	W-4500	2001	HHD	15	91	9.31	44.51	119.08	1.28	1.28	0.06	0.00	0.00	0.01	0.00	0.00	0.00
Flat Bed Truck	TTX	Isuzu	NPR HD	2001	HHD	15	91	9.31	44.51	119.08	1.28	1.28	0.06	0.00	0.00	0.01	0.00	0.00	0.00
Truck	TTX	Ford	F350	2001	LHDT1	15	91	3.17	26.30	75.05	0.72	0.72	0.04	0.00	0.00	0.01	0.00	0.00	0.00
Truck	TTX	Ford	F250	2001	MHD	15	91	3.17	26.30	75.05	0.72	0.72	0.04	0.00	0.00	0.01	0.00	0.00	0.00
Flat Bed Truck	TTX	Chevy	W-4500	2003	HHD	15	91	7.65	41.43	123.52	0.99	0.99	0.06	0.00	0.00	0.01	0.00	0.00	0.00
Total														**0.01**	**0.04**	**0.10**	**0.00**	**0.00**	**0.00**

Notes:
1. The 2005 baseline annual VMT estimated based on the vehicle age and odometer reading. Assumed no change from the 2005 baseline
2. Running exhaust emissions calculated using the EMFAC2007 model with the BURDEN output option.
3. Running exhaust emission factor calculations assumed an average speed of 15 mph.
4. The PM10 emission factor includes engine exhaust emissions along with brake and tire wear. The DPM emission factor includes engine exhaust emissions only.
5. Idling time (hr/yr) is an engineering estimate based on discussions with UPRR staff.
6. Idling exhaust emissions factors calculated using the EMFAC2007 model with the EMFAC output option.

Summary of Emissions from Diesel-Fueled Yard Trucks
City of Industry Rail Yard, City of Industry, CA

Running Exhaust Emissions

Equipment Type	Equipment ID/Owner	Make	Model	Year	Vehicle Class	VMT (mi/yr)[1]	2020 Emission Factors (g/mi)[2,3]						2020 Emissions Estimates (tpy)					
							ROG	CO	NOx	PM10[4]	DPM[4]	SOx	ROG	CO	NOx	PM10	DPM	SOx
Boom Truck	UP65629	International	4900	1992	HHD	10,584	9.07	23.59	30.84	3.63	3.63	0.05	0.11	0.28	0.36	0.04	0.04	0.00
Welder Truck	65984	Ford	F-800	1992	MHD	17,065	1.81	12.70	18.14	1.81	1.81	0.05	0.03	0.24	0.34	0.03	0.03	0.00
Boom Truck	UP 68842	Ford	F-Series	1997	HHD	13,767	10.75	26.88	34.61	3.36	3.02	0.05	0.16	0.41	0.53	0.05	0.05	0.00
Gang Truck	60099	Freightliner	Unknown	1999	HHD	13,556	10.52	25.95	35.38	3.08	2.90	0.05	0.16	0.39	0.53	0.05	0.04	0.00
Flat Bed Truck	TTX	Isuzu	NPR HD	2000	HHD	8,973	10.37	25.63	35.14	3.02	2.88	0.05	0.10	0.25	0.35	0.03	0.03	0.00
Flat Bed Truck	TTX	Chevy	W-4500	2001	HHD	6,714	10.23	25.24	35.13	2.97	2.80	0.05	0.08	0.19	0.26	0.02	0.02	0.00
Flat Bed Truck	TTX	Isuzu	NPR HD	2001	HHD	5,795	10.23	25.24	35.13	2.97	2.80	0.05	0.07	0.16	0.22	0.02	0.02	0.00
Truck	TTX	Ford	F350	2001	LHDT1	9,282	0.65	3.24	9.07	0.81	0.81	0.05	0.01	0.03	0.09	0.01	0.01	0.00
Truck	TTX	Ford	F250	2001	MHD	21,556	0.81	7.46	13.91	0.81	0.81	0.05	0.02	0.18	0.33	0.02	0.02	0.00
Flat Bed Truck	TTX	Chevy	W-4500	2003	HHD	10,065	4.11	9.64	26.22	0.99	0.85	0.54	0.05	0.11	0.29	0.01	0.01	0.01
Total													**0.78**	**2.23**	**3.30**	**0.28**	**0.27**	**0.01**

Idling Exhaust Emissions

Equipment Type	Equip. ID	Make	Model	Model Year	Vehicle Class	Idling[5]		2020 Emission Factors (g/hr)[6]						2020 Emissions Estimates (tpy)					
						(min/day)	(hr/yr)	ROG	CO	NOx	PM10	DPM	SOx	ROG	CO	NOx	PM10	DPM	SOx
Boom Truck	UP65629	International	4900	1992	HHD	15	91	15.52	53.81	101.42	2.47	2.47	0.06	0.00	0.01	0.01	0.00	0.00	0.00
Welder Truck	65984	Ford	F-800	1992	MHD	15	91	3.17	26.30	75.05	1.34	1.34	0.04	0.00	0.00	0.01	0.00	0.00	0.00
Boom Truck	UP 68842	Ford	F-Series	1997	HHD	15	91	12.41	49.53	110.27	1.85	1.85	0.06	0.00	0.00	0.01	0.00	0.00	0.00
Gang Truck	60099	Freightliner	Unknown	1999	HHD	15	91	9.31	44.51	119.08	1.28	1.28	0.06	0.00	0.00	0.01	0.00	0.00	0.00
Flat Bed Truck	TTX	Isuzu	NPR HD	2000	HHD	15	91	9.31	44.51	119.08	1.28	1.28	0.06	0.00	0.00	0.01	0.00	0.00	0.00
Flat Bed Truck	TTX	Chevy	W-4500	2001	HHD	15	91	9.31	44.51	119.08	1.28	1.28	0.06	0.00	0.00	0.01	0.00	0.00	0.00
Flat Bed Truck	TTX	Isuzu	NPR HD	2001	HHD	15	91	9.31	44.51	119.08	1.28	1.28	0.06	0.00	0.00	0.01	0.00	0.00	0.00
Truck	TTX	Ford	F350	2001	LHDT1	15	91	3.17	26.30	75.05	0.72	0.72	0.04	0.00	0.00	0.01	0.00	0.00	0.00
Truck	TTX	Ford	F250	2001	MHD	15	91	3.17	26.30	75.05	0.72	0.72	0.04	0.00	0.00	0.01	0.00	0.00	0.00
Flat Bed Truck	TTX	Chevy	W-4500	2003	HHD	15	91	7.65	41.43	123.52	0.99	0.99	0.06	0.00	0.00	0.01	0.00	0.00	0.00
Total														**0.01**	**0.04**	**0.10**	**0.00**	**0.00**	**0.00**

Notes:
1. The 2005 baseline annual VMT estimated based on the vehicle age and odometer reading. Assumed no change from the 2005 baseline
2. Running exhaust emissions calculated using the EMFAC2007 model with the BURDEN output option.
3. Running exhaust emission factor calculations assumed an average speed of 15 mph.
4. The PM10 emission factor includes engine exhaust emissions along with brake and tire wear. The DPM emission factor includes engine exhaust emissions only.
5. Idling time (hr/yr) is an engineering estimate based on discussions with UPRR staff.
6. Idling exhaust emissions factors calculated using the EMFAC2007 model with the EMFAC output option.

APPENDIX B

GROWTH RATE DATA

Union Pacific Railroad: Key Operating Measures

Annual Gross Ton-Miles, Revenue Ton-Miles, & Diesel Fuel Consumption

Year	U.P. Revenue Ton Miles per Gallon of Diesel Consumed	% Change	Diesel Fuel Consumed *(millions)*	% Change	U.P. Revenue Ton Miles *(billions)*	% Change	U.P. Gross Ton Miles (*billions)*	% Change
1996	392	-	824	-	323	-	760	-
1997	368	-	1,229	-	452	-	860	13.2%
1998	376	2.2%	1,150	-6.4%	432	-4.4%	826	-3.9%
1999	380	1.2%	1,244	8.2%	473	9.5%	898	8.7%
2000	375	-1.3%	1,293	3.9%	485	2.6%	931	3.7%
2001	391	4.2%	1,287	-0.5%	504	3.8%	958	2.8%
2002	394	0.8%	1,315	2.2%	519	3.0%	994	3.8%
2003	401	1.6%	1,330	1.1%	533	2.7%	1019	2.5%
2004	397	-1.0%	1,377	3.5%	546	2.5%	1038	1.8%
2005	406	2.2%	1,353	-1.7%	549	0.5%	1044	0.6%
2006	412	1.6%	1,372	1.4%	565	3.0%	1073	2.7%
2007	424	2.8%	1,326	-3.4%	562	-0.6%	1052	-1.9%
Average % Change		**1.4%**		**0.8%**		**2.3%**		**2.1%**

Notes:
Source: Union
Quarterly Earnings Releases and Analyst Presentations (4th Quarter each year 1997-2007)
http://www.up.com/investors/earnings/index.shtml

1996 data from UPRR Report R-1 to Surface Transportation Board, provided as reference point to pre-UP/SP merger.

1996-1997 data not included in averages shown above. UP/SP merger was completed on Sept. 11, 1996; 1998 is first year that is representative for comparison to current operations.

Union Pacific Railroad
Lift Count Data for the City of Industry Rail Yard

Calendar Year	Lift Count
2005	200,814
2007	192,204
2008	194,126
2009	196,067
2010	198,028
2011	200,008
2012	202,008
2013	204,028
2014	206,069
2015	208,129
2016	210,211
2017	212,313
2018	214,436
2019	216,580
2020	218,746

Notes:

1. Lift counts for 2005 and 2007 are acutal data provided by UPRR.
2. Lift counts for 2008-2020 assume a 1% per year growth rate from 2007.