Presentation Overview

- Meeting Purpose / Public Review Period
- Background
- Methodology for Preparing the Draft Assessments
- Results of the Draft Assessments
- Actions to Reduce Health Risks
- Next Steps
Meeting Purpose
Public Review Period
Purpose of today’s meeting:
- Present our draft analyses and explain results
- Discuss progress being made
- Answer your questions
- Initiate process for review and comment

After today’s meeting there will be:
- Opportunity for comments, both in writing and at second community meeting in 45 days
- Consultation to obtain your ideas on possible future emission reduction actions
# Health Risk Assessment Timelines

<table>
<thead>
<tr>
<th>Railyard</th>
<th>Company</th>
<th>Railyard</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commerce/Eastern</td>
<td>BNSF</td>
<td>Barstow</td>
<td>BNSF</td>
</tr>
<tr>
<td>Hobart</td>
<td>BNSF</td>
<td>San Bernardino</td>
<td>BNSF</td>
</tr>
<tr>
<td>Richmond</td>
<td>BNSF</td>
<td>San Diego</td>
<td>BNSF</td>
</tr>
<tr>
<td>Stockton</td>
<td>BNSF</td>
<td>Colton</td>
<td>UP</td>
</tr>
<tr>
<td>Wilmington (Watson)</td>
<td>BNSF</td>
<td>Dolores (ICTF)</td>
<td>UP</td>
</tr>
<tr>
<td>Commerce</td>
<td>UP</td>
<td>Industry</td>
<td>UP</td>
</tr>
<tr>
<td>LATC (Los Angeles)</td>
<td>UP</td>
<td>Oakland</td>
<td>UP</td>
</tr>
<tr>
<td>Mira Loma</td>
<td>UP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stockton</td>
<td>UP</td>
<td></td>
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BACKGROUND
Background

- This effort is part of our commitment to address pollution impacts on communities
  - Implements the ARB Goods Movement Plan
  - Required by the ARB/UP/BNSF Railroad Agreement

- The State’s goals are to:
  - Reduce exposure to diesel PM as quickly as possible
  - Reduce risks by at least 85 percent by 2020
  - Obtain the emission reductions needed to attain air quality standards
Purpose of the Assessments

- Identify pollution sources in the railyards
- Determine exposures to the public
- Estimate the health risks
- Put the railyard risks into perspective with other sources
- Provide information needed to reduce the risk
Scope of the Draft Assessments

- Two major parts:
  - Health risk assessment for the railyard
  - Health risk assessment for significant diesel sources surrounding the community
- Separate report for each railyard
- Combined report for the four Commerce railyards
- Focus on diesel PM; other toxic sources evaluated, but small relative to diesel PM
Methodology for Preparing the Draft Assessments
Railyard Risk Assessment Methodology

- Prepare the best possible emissions inventory
- Complete air dispersion modeling
- Provide estimates of health risks
- Determine other sources of risks
Area of Study - UP LATC Railyard
Prepare Railyard Emissions Inventory

Diesel PM Emission Inventory

- Locomotives (line-hauls, switchers, & services)
- On-road trucks & vehicles
- Cargo handling equipment
- Off-road equipment
- Stationary Sources (point & area)
Estimating Emissions

- Fleet/Equipment population
- Operational activity
  - Hours of operation
  - Load factor
  - Vehicle miles traveled (VMT)
  - Hours per day
- Emission factors
- Fuel characteristics
  - Fuel usage
  - Sulfur content
Example - Locomotive Emissions

- Number of locomotives by class
- Time operating at each notch setting and in idle mode
- Emission factors by locomotive type and mode (notch setting/idling)
- Hours of operation in each mode
- Types and amount of fuel used
### Summary of UP LATC Railyard Diesel PM Emissions (2005)

<table>
<thead>
<tr>
<th>RAILYARD SOURCES</th>
<th>UP LATC</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LOCOMOTIVES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switcher</td>
<td>2.46</td>
<td>36%</td>
</tr>
<tr>
<td>Line-haul Service</td>
<td>0.73</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>3.19</td>
<td>46%</td>
</tr>
<tr>
<td><strong>CARGO HANDLING EQUIPMENT</strong></td>
<td>2.26</td>
<td>33%</td>
</tr>
<tr>
<td>On-Road Trucks</td>
<td>0.99</td>
<td>14%</td>
</tr>
<tr>
<td><strong>OTHERS</strong></td>
<td>0.46</td>
<td>7%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>6.9</td>
<td>100%</td>
</tr>
</tbody>
</table>
Prepare Non-Railyard Emission Inventories

- Focus on diesel PM sources
- Identify the population of trucks on roads
- Apply specific emission factors to the trucks
- Calculate emissions
### Summary of Nearby Non-Railyard Diesel PM Emission Inventory

<table>
<thead>
<tr>
<th>Sources</th>
<th>Tons per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile Sources</td>
<td>31.7</td>
</tr>
<tr>
<td>Stationary Sources</td>
<td>1.3</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>33.0</strong></td>
</tr>
</tbody>
</table>
## Comparison of Local Diesel PM Sources with Regional Sources

<table>
<thead>
<tr>
<th>Sources</th>
<th>Locomotive</th>
<th>Cargo Handling Equipment</th>
<th>On-Road Trucks</th>
<th>Other (e.g. Ships, Refrig. Trailers)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Coast Air Basin</td>
<td>300</td>
<td>500</td>
<td>2,000</td>
<td>5,000</td>
<td>7,800</td>
</tr>
<tr>
<td>Port of LA/Long Beach</td>
<td>20</td>
<td>170</td>
<td>40</td>
<td>1,570</td>
<td>1,800</td>
</tr>
<tr>
<td>UP LATC Railyard</td>
<td>3.19</td>
<td>2.26</td>
<td>0.99</td>
<td>0.46</td>
<td>6.9</td>
</tr>
<tr>
<td>Nearby Roadways</td>
<td>--</td>
<td>--</td>
<td>31.7</td>
<td>--</td>
<td>31.7</td>
</tr>
</tbody>
</table>
Complete Air Dispersion Modeling

- Use air quality modeling to estimate the amount of diesel PM in the air surrounding a source
- Express results as a “concentration” in units of micrograms per cubic meter of air
- Use U.S. EPA-approved computer models
- Major inputs to the model:
  - Emissions inventory
  - Meteorological data (wind speed/direction, temperature, etc.)
Estimate Health Risks

- Combine air dispersion modeling results with toxicity data to estimate health risks
- Determine risks for cancer and non-cancer effects
- Express results as chances per million for cancer and a “hazard index” for non-cancer impacts
- Use toxicity data provided by the California Office of Environmental Health Hazard Assessment
- No significant impacts on the communities identified for non-cancer effects
Results of the Draft Assessments
UP LATC Railyard Potential Cancer Risks

- **Locations Nearest to Railyard**: Added Risk 184, Regional Background 1,000
- **Within 1-mile from Railyard**: Added Risk 70, Regional Background 1,000
- **Non-Railyard (1-mile)**: Added Risk 318, Regional Background 1,000

*Estimated Exposed Population: 8,400*

*Estimated Exposed Population: 69,700*
Results

Location of Potential Cancer Risks

UP LATC Railyard
Results

Location of Potential Cancer Risks

Non-Railyard Sources
Actions to Reduce Health Risk
Approach to Reducing Emissions

- ARB regulations
  - Fuels
  - Cargo handling equipment
  - Transport refrigeration units
  - Heavy-duty diesel on-road trucks and off-road vehicles
- U.S. EPA regulation
  - Locomotives
- Voluntary agreements
  - 1998 South Coast/2005 Statewide
- Railroad yard locomotive replacement program
- Funding programs
  - Carl Moyer Incentives
Benefits of California Railyard Diesel PM
Emission Reduction Measures

- **2005-2007:**
  - CARB diesel fuel for intrastate locomotives
  - 2005 railyard agreement

- **2005-2010:**
  - Measures above plus:
  - 1998 NOx locomotive fleet average agreement (South Coast)
  - ARB cargo handling equipment regulation
  - ARB on-road heavy-duty truck regulation
  - ARB transport refrigeration unit regulation

\[ \approx 15-20\% \]
\[ \approx 40-50\% \]
### Progress Report - Existing Measures

#### Diesel Fuel Standards

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>Maximum Sulfur Level (ppmw)</th>
<th>Aromatics Maximum (% by volume)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prior</td>
<td>2006-2007</td>
</tr>
<tr>
<td>CARB Diesel</td>
<td>500</td>
<td>15</td>
</tr>
<tr>
<td>EPA On-Road Diesel</td>
<td>500</td>
<td>15</td>
</tr>
<tr>
<td>EPA Non-road Diesel</td>
<td>5,000</td>
<td>500*</td>
</tr>
</tbody>
</table>

* Lower to 15 ppmw in 2012.
Progress Report - Existing Measures
Average Diesel Fuel Sulfur Levels Consumed by Locomotives in California

![Graph showing average diesel fuel sulfur levels for years 2005, 2007, and 2012.]
Progress Report - Existing Measures
South Coast Railyard Diesel PM Emission Reductions: Line-Haul Locomotives

* Based on 7 South Coast railyards line-haul locomotives emissions
Progress Report - Existing Measures
South Coast Railyard Diesel PM Emission Reductions:
Cargo Handling Equipment

* Based on 7 South Coast railyards cargo handling equipment emissions
Progress Report - Existing Measures
South Coast Railyard Diesel PM Emission Reductions: New On-Road Trucks

* Based on 7 South Coast railyards on-road truck emissions
Possible Additional Measures

- 2005-2020:
  - U.S. EPA locomotive rulemaking
  - California replacement of switch locomotives
  - ARB in-use truck measure

≈60-80%
Progress Report – Potential Measures
South Coast Railyard Diesel PM Emission Reductions: Switcher Locomotive Replacement by 2010

* Based on 7 South Coast railyards switcher locomotives emissions
Progress Report - Potential Measures
South Coast Railyard Diesel PM Emission Reductions:
In Use On-Road Trucks

* Based on 7 South Coast railyards on-road truck emissions

- In addition to the existing on-road heavy-duty truck regulation.
Progress Report - Potential Measure
South Coast Railyard Diesel PM Emission Reductions: U.S. EPA Locomotive Rulemaking

* Based on 7 South Coast railyards line-haul locomotives emissions

In addition to the existing Line-haul locomotive fleet average agreement.
Progress Report - Existing + Potential Measures
Total Benefits of the Emission Reductions Measures
for the South Coast Railyards

* Based on 7 South Coast railyards diesel PM emissions
Next Steps
Next Steps

- Begin public comment period
- Review the draft assessments
- Submit written comments to ARB
- Hold next series of community meetings
- Meet with interested stakeholders
- Evaluate any additional feasible mitigation measures
ARB Railyard Contacts

- **Manager**
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    (916) 322-8875; jyuan@arb.ca.gov
  - Eugene Yang, Ph.D., P.E.
    (916) 327-1510; eyang@arb.ca.gov

- **ARB Railyard HRA Website:**
  - http://www.arb.ca.gov/railyard/hra/hra.htm