Draft ARB Health Risk Assessments
For The UP Mira Loma Railyard

May 24, 2007

California Environmental Protection Agency
Air Resources Board
Presentation Overview

- Meeting Purpose/Public Review Period
- Background
- Methodology for Preparing the Draft Assessments
- Results of the Draft Assessments
- Actions to Reduce Health Risk
- Next Steps
Purpose and Public Review

- **Purpose of tonight’s meeting:**
  - Present our draft analyses and explain results
  - Discuss progress being made
  - Answer your questions
  - Initiate process for review and comment

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

<table>
<thead>
<tr>
<th>Draft Health Risk Assessments to be completed by <em>Spring 2007</em></th>
<th>Draft Health Risk Assessments to be completed by <em>the end of 2007</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Railyard Company</td>
<td>Railyard Company</td>
</tr>
<tr>
<td>Commerce/Eastern BNSF</td>
<td>Barstow BNSF</td>
</tr>
<tr>
<td>Hobart BNSF</td>
<td>San Bernardino BNSF</td>
</tr>
<tr>
<td>Richmond BNSF</td>
<td>San Diego BNSF</td>
</tr>
<tr>
<td>Stockton BNSF</td>
<td>Colton UP</td>
</tr>
<tr>
<td>Wilmington (Watson) BNSF</td>
<td>Dolores (ICTF) UP</td>
</tr>
<tr>
<td>Commerce UP</td>
<td>Industry UP</td>
</tr>
<tr>
<td>LATC (Los Angeles) UP</td>
<td>Oakland UP</td>
</tr>
<tr>
<td>Mira Loma UP</td>
<td></td>
</tr>
<tr>
<td>Stockton UP</td>
<td></td>
</tr>
</tbody>
</table>
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 – Mira Loma 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 Mira Loma Railyard Diesel PM Emissions (2005)

<table>
<thead>
<tr>
<th>RAILYARD SOURCES</th>
<th>Tons per year</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LOCOMOTIVES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line-haul</td>
<td>2</td>
<td>49%</td>
</tr>
<tr>
<td>Switcher</td>
<td>2.4</td>
<td>42%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>4.4</td>
<td>91%</td>
</tr>
<tr>
<td><strong>ON-ROAD TRUCKS</strong></td>
<td>0.2</td>
<td>4%</td>
</tr>
<tr>
<td><strong>Off-Road Equipment</strong></td>
<td>0.24</td>
<td>5%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>4.9</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>30.6</td>
</tr>
<tr>
<td>Stationary Sources</td>
<td>0.1</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>30.7</strong></td>
</tr>
</tbody>
</table>
## Comparison of Local Diesel PM Sources with Regional Sources

(tons per year in 2005)

<table>
<thead>
<tr>
<th>Sources</th>
<th>Locomotive</th>
<th>Cargo Handling Equipment</th>
<th>On-Road Trucks</th>
<th>Off-Road Equipment</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 Mira Loma Railyard</td>
<td>4.4</td>
<td>--</td>
<td>0.2</td>
<td>0.24</td>
<td>4.9</td>
</tr>
<tr>
<td>Nearby Roadways</td>
<td>--</td>
<td>--</td>
<td>30.6</td>
<td>--</td>
<td>30.6</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
## Results – UP Mira Loma Railyard

<table>
<thead>
<tr>
<th>Locations Nearest to Railyard</th>
<th>Within 1-mile from Railyard</th>
<th>Non-Railyard (1-mile)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Estimated Cancer risk</strong></td>
<td><strong>Estimated Cancer risk</strong></td>
<td><strong>Estimated Cancer risk</strong></td>
</tr>
<tr>
<td>(Chances Per Million)</td>
<td>(Chances Per Million)</td>
<td>(Chances Per Million)</td>
</tr>
<tr>
<td><em>Estimated Exposed Population</em></td>
<td><em>Estimated Exposed Population</em></td>
<td><em>Estimated Exposed Population</em></td>
</tr>
<tr>
<td>Added Risk</td>
<td>Regional Background</td>
<td></td>
</tr>
<tr>
<td>580*</td>
<td>11,600*</td>
<td>11,600*</td>
</tr>
<tr>
<td>75</td>
<td>20</td>
<td>140</td>
</tr>
<tr>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
</tr>
</tbody>
</table>

* Estimated Exposed Population

### Diagram Description:
- **Estimated Cancer Risk:**
  - **Locations Nearest to Railyard:** 580*
  - **Within 1-mile from Railyard:** 11,600*
  - **Non-Railyard (1-mile):** 1,000

- **Added Risk** and **Regional Background** are represented in the bars.

- *Estimated Exposed Population* indicates the population at risk within each category.
Results
Location of Potential Cancer Risks
UP Mira Loma 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

- 2005: 1100 ppmw
- 2007: 80 ppmw
- 2012: 10 ppmw
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 - Potential 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
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

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

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    (916) 327-1510; eyang@arb.ca.gov

➢ ARB Railyard HRA Website:
  – http://www.arb.ca.gov/railyard/hra/hra.htm