AIR QUALITY DISPERSION MODELING OF PORT NEWARK & ELIZABETH

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NJDEP, Diesel Risk Reduction Pgm

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MARAMA Data Analysis Workshop
PORT NEWARK / ELIZABETH AND THE PROXIMITY OF NEWARK AIRPORT
FIGURE 1: MODEL RECEPTOR INNER GRID AND LOCATION OF RESIDENTIAL NEIGHBORHOODS NEAR TO THE PORT
Baseline Emissions

TPY PM2.5

Oceangoing Vessels
Cargo Handling
Trucks
Tugs & harborcraft
Locomotive

TPY PM2.5
Findings

• Annual PM2.5 NAAQS
  – okay

• 24hr PM2.5 NAAQS
  – significant contribution to existing violation at several locations

• Cancer risk
  – 150 in a million risk in Bayonne; other communities 10-100 in a million
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FIGURE 2: MAXIMUM PREDICTED ANNUAL PM2.5 CONCENTRATIONS DUE TO ALL PORT ACTIVITIES (not including background)

Legend

- Property line
- 0 - 0.3 ug/m³ (below SIL)
- 0.3 - 1 ug/m³ (above SIL)
- 1 - 2 ug/m³
- Greater than 2.0 ug/m³
- Residential
- Newark Airport

Adjusted background PM2.5 at Elizabeth Lab = 13.4 ug/m³ (2006-2008 average)
Significant Impact Level = 0.3ug/m³
NAAQS = 15.0 ug/m³
FIGURE 3: MAXIMUM PREDICTED 24-HOUR PM2.5 CONCENTRATIONS DUE TO ALL PORT ACTIVITIES (not including background)

Legend:
- 0 - 1.2 ug/m³ (below SIL)
- 1.2 - 2 ug/m³ (above SIL)
- 2 - 4 ug/m³
- Greater than 4 ug/m³
- Newark Airport
- Airports
- Property line
- Water
- Residential

Background PM2.5 at Elizabeth Lab = 35.3 ug/m³ (2006-2008 average)

Interim Significant Impact Level = 1.2 ug/m³

NJ/AGS = 35 ug/m³
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FIGURE 4: MAXIMUM PREDICTED 70-YEAR LIFETIME CANCER RISK DUE TO PORT-RELATED DIESEL PARTICULATE EMISSIONS (not including background)

Legend

- Residntial
- 0 - 10 in a million risk
- 10 - 100 in a million risk
- 100 - 1000 in a million risk
- Greater than 1000 in a million risk
- Property line
- Newark Airport

Risk Management Action Levels:

- 10 - 100: Long-term risk reduction
- 100 - 1000: Short-term risk reduction

Maximum offsite risk is 17.3 in a million
Maximum residential risk is 150 in a million
Health risk assessment
Potential for diesel particulate matter to cause cancer
Lifetime exposure
Cancer risk: number of cases in a million
## NJDEP Risk Management Procedures for Facility-Wide Risk from Existing Sources

<table>
<thead>
<tr>
<th>CANCER RISK</th>
<th>DEP CLASSIFICATION</th>
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</thead>
<tbody>
<tr>
<td>&gt;1000 in a million</td>
<td>Unacceptable risk</td>
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<tr>
<td>100-1000 in a million</td>
<td>Pursue short term (&lt;1 yr) risk minimization strategy</td>
</tr>
<tr>
<td>10-100 in a million</td>
<td>Pursue long term (&gt;1 yr) risk minimization strategy</td>
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<tr>
<td>&lt;10 in a million</td>
<td>Negligible risk</td>
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Clean Air Strategy Plan

• 3% net annual reduction in criteria pollutants
• 5% net annual reduction in GHG
• Developed with diverse group of stakeholders and finalized during press event Oct 2009
• Short & long term commitments for each sector
2015 Modeling Assumptions

1. Fleet turnover;
2. Federal fuel requirements;
3. Implemented and committed actions under the Clean Air Strategy Plan.
2015 Growth Assumptions

- HDDV
- OGV
- CHE
- Rail
Total PM2.5 emissions from all sources
# FINDINGS

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Future year</th>
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<tbody>
<tr>
<td><strong>Annual NAAQS</strong></td>
<td>Ok</td>
<td>Ok</td>
</tr>
<tr>
<td><strong>24 hour NAAQS</strong></td>
<td>Significant contribution to existing violn</td>
<td>Ok</td>
</tr>
<tr>
<td><strong>SIL</strong></td>
<td>Exceedance of annual &amp; 24 hour SIL at several locns</td>
<td>Ok</td>
</tr>
</tbody>
</table>
| **Cancer Risk**      | 150 in a million in Bayonne. 10-100 at other locations. | 10-100 at all locations. }
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FIGURE 2: MAXIMUM PREDICTED ANNUAL PM2.5 CONCENTRATIONS IN 2006 AND 2015 DUE TO ALL PORT ACTIVITIES (not including background)

2006

2015 with CASP reductions

Legend
- Property line
- 0 - 0.3 ug/m³ (below interim SIL)
- 0.3 - 1 ug/m³ (above interim SIL)
- 1 - 2 ug/m³
- Greater than 2.0 ug/m³
- Residential
- Newark Airport

Adjusted background PM2.5 at Elizabeth Lab = 12.7 ug/m³ (2007-2009 average)
Significant Impact Level = 0.3ug/m³
NAAGS = 15.0ug/m³
Figure 3: Maximum Predicted 24-Hour PM2.5 Concentrations in 2006 and 2015 Due to All Port Activities (not including background)

Legend:
- Property line
- Residential
- 0 - 1.2 ug/m$^3$ (below interim S.I.L)
- 1.2 - 2 ug/m$^3$ (above interim S.I.L)
- 2 - 4 ug/m$^3$
- Greater than 4 ug/m$^3$
- Newark Airport

Adjusted background PM2.5 at Elizabeth Lab = 32.2 ug/m$^3$ (2007-2009 average)
Significant Impact Level (Interim) = 1.2ug/m$^3$
NAAQS = 35.0ug/m$^3$
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FIGURE 4: MAXIMUM PREDICTED 70-YEAR LIFETIME CANCER RISK DUE TO FUTURE PORT-RELATED DIESEL PARTICULATE EMISSIONS IN 2006 AND 2015 (not including background)

Legend
- Property line
- Residential
- 0 - 10 in a million risk
- 10 - 100 in a million risk
- 100 - 1000 in a million risk
- Greater than 1000 in a million risk
- Newark Airport
CONTACT INFO

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