Evaluation of Safety and Health Hazards, New Orleans Louisiana During Cleanup Operations, Hurricane Katrina 2005-2006

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Objectives

- Describe process of developing a coordinated Debris Management, Health and Safety, and IH sampling plans
- Present OSHA sampling data for debris management operations
Debris Management Plan

- Agency Coordination
  - USACE
  - LDEQ
  - EPA
  - OSHA
  - HHS
  - FEMA
  - Other State and Local
Waste Streams

- Green Waste
- C&D Waste
- Household Waste
Waste Streams

- White Goods and A/C Units
- Boats, Automobiles, Tires
- Household Hazardous Waste
- Universal Waste
- Mixed, Process or Listed Waste
Waste Streams

- Putrescibles
- Asbestos
Waste Streams

- Residual solids
Debris Operations

- Assessment
- Segregation
- Demolition
- Collection
- Reduction
  - Incineration by air curtain or open pit burning
  - Grinding and Chipping
  - Compaction
  - Recycling
- Disposal
Debris Operations – Assessment
Debris Operations – Segregation
Debris Operations – Demolition
Debris Operations – Demolition

[Images of debris operations and demolition scenes]
Debris Operations – Reduction
Debris Operations – Disposal
Challenges

- Large area
- Little infrastructure
- Changing debris stream
- Marsh and other water operations
- Limited landfill and other appropriate staging and disposal space
  - Formosan Termites
- Limited options for some reduction methods
Coordination of S&H Resources

- S&H provisions in contracts to prime contractors
- Coordinated HASPs and SAPs among federal agencies and contractors
- Daily meetings at operations level
  - Operations
  - Hazards
  - Injuries, illnesses, near-misses
  - Sample results
IH Sampling

- Integrated and direct-reading methods
- In depth and customized data collection to create historic database of information
  - GPS location
  - Work tasks
  - Debris stream
  - Controls
    - Engineering
    - Workpractice
    - PPE
- Data review to change frequency of sampling and needed controls
- No bio-sampling
IH Sampling - Agents

- Noise
- Vapors and Gases (25)
  - Freons
  - Sulfur dioxide
  - BTEX
  - Formaldehyde
  - Carbon Monoxide
  - Petroleum products
  - Gluteraldehyde
- Metals (15)
- Total and Respirable Dust
- PAHs
- Total fibers
- Fiberglass
- Asbestos
- Mercury
- Combustion products
- Silica
- Wood dust
- Combustible gas
- Oxygen
- Ionizing Radiation
OSHA Air and Noise Monitoring

❑ Summary results on website:

www.osha.gov/katrina/lisareports/katrinaresults.html
Evaluation of Sample Results

- Results are a TWA for time sampled not necessarily an 8-hr TWA
- Comparisons to OSHA 8-hr PEL or other appropriate OEL to determine hazardous tasks or “overexposures”
- Other “at risk” tasks identified when $AL < TWA < PEL$
## Summary of Noise Dosimetry

<table>
<thead>
<tr>
<th>Total number of samples</th>
<th>Number of samples (% of total samples)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TWA $\geq 85$ dBa</td>
</tr>
<tr>
<td></td>
<td>TWA $\geq 90$ dBa</td>
</tr>
<tr>
<td>901</td>
<td>417 (46%)</td>
</tr>
<tr>
<td></td>
<td>141 (16%)</td>
</tr>
</tbody>
</table>
Noise – Highest Exposures

- Debris collection/removal
  - Heavy equipment operators
  - Industrial vacuum operators
  - Laborers
  - Chainsaw operators
  - Truck Drivers
  - Flaggers/Spotters
- Debris reduction
  - Chipping and grinding
- Site clearing/grading
# Summary of Metal Samples

<table>
<thead>
<tr>
<th>Total number of samples</th>
<th>Number of samples (% of total samples)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-Detected (ND)</td>
</tr>
<tr>
<td></td>
<td>3094 (97%)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Summary of Gas and Vapor Samples

<table>
<thead>
<tr>
<th>Total number of samples</th>
<th>Number of samples (% of total samples)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-Detected (ND)</td>
</tr>
<tr>
<td></td>
<td>TWA &lt; 0.5 x PEL</td>
</tr>
<tr>
<td></td>
<td>0.5 x PEL ≤ TWA &lt; PEL</td>
</tr>
<tr>
<td></td>
<td>TWA ≥ PEL</td>
</tr>
<tr>
<td>1020</td>
<td>787 (77%)</td>
</tr>
<tr>
<td></td>
<td>175 (17%)</td>
</tr>
<tr>
<td></td>
<td>41 (4%)</td>
</tr>
<tr>
<td></td>
<td>17 (2%)</td>
</tr>
</tbody>
</table>
Gas and Vapors – Highest Exposures

- Carbon Monoxide
  - ~20% above AL
  - Building Inspections/Assessments
  - Saws
  - Burning

- Formaldehyde
  - ~20% above AL
  - Prefabricated trailer delivery and installation
## Summary of Asbestos Samples

<table>
<thead>
<tr>
<th>Total number of samples</th>
<th>Number of samples (% of total samples)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-Detected (ND)</td>
</tr>
<tr>
<td>652</td>
<td>626 (96%)</td>
</tr>
</tbody>
</table>

- TWA ≥ PEL: Total number of samples
- TWA ≤ PEL: Number of samples (% of total samples)
Asbestos – Highest Exposures

- Roof Removal

- Curbside collection of dry asbestos debris

- Awaiting results from large scale demolition work
## Summary of Particulate Samples

<table>
<thead>
<tr>
<th>Total number of samples</th>
<th>Number of samples (% of total samples)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-Detected (ND)</td>
</tr>
<tr>
<td>1278</td>
<td>89 (7%)</td>
</tr>
</tbody>
</table>
Particulates – Highest Exposures

- **Heavy equipment operators**
  - ~10% > PEL
  - ~30% > AL
- **Reduction and collection laborers**
  - ~5% > PEL
- **Spotters/Flaggers**
  - ~1% > PEL
Summary of Silica Samples

<table>
<thead>
<tr>
<th>Total number of samples</th>
<th>Non-Detected (ND)</th>
<th>TWA &lt;0.5 x PEL</th>
<th>0.5 x PEL ≤ TWA &lt; PEL</th>
<th>TWA ≥ PEL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>515</td>
<td>82 (16%)</td>
<td>350 (68%)</td>
<td>29 (6%)</td>
<td>54 (10%)</td>
</tr>
</tbody>
</table>
Silica – Highest Exposures

- Heavy equipment operators
  - Concrete
  - Brick
  - Running over crushed debris

- Sawing and Grinding
  - ~70% > PEL
  - Contractors - Chipping and Grinding
Conclusions

- Communication and coordination key to successful safety and health program
  - Interagency and Contractors
  - All levels of operations

- IH monitoring helped identify areas and tasks of concern and validate controls
  - Changing waste stream
  - Engineering
  - Work practices
  - PPE