Highway 36 | Triangle Lake
Exposure Investigation
Public Meeting

Pesticide Analytical Response Center (PARC)
US Environmental Protection Agency
(USEPA)
CDC Agency for Toxic Substances and Disease Registry
(ATSDR)

Tonight’s Agenda

• Welcome and Introductions
• Update on investigation
• Break
• Question and Answers
• Break
• Public Comment
Update on the Exposure Investigation

ATSDR Exposure Investigation Report
Environmental Data
OHA Public Health Assessment

Purpose of the Investigation

The purpose of this exposure investigation is to determine if residents of the Highway 36/Triangle Lake area are being exposed to pesticides from local application practices.

Key Questions of the Multi-Agency Exposure Investigation

Are residents in the Highway 36/Triangle Lake area being exposed to pesticides?
- If so, what pesticides are they being exposed to?
- To what extent are they being exposed?
- What are potential source(s) of the pesticides to which they are being exposed?
- Are these exposures coming from local application practices?
- What exposure pathways are responsible for these exposures?
OHA compiles and evaluates multiple sources of data to answer key exposure questions.

Environmental Data (Water, Food, Air)
- Collected by EPA in coordination w/ OHA
- Analyzed by ODEQ, ODA and EPA labs
- Reported by OHA

Biological Data (Urine)
- Collected by ATSDR in coordination w/ OHA
- Analyzed by NCEH
- Reported by ATSDR

Application Data
- Obtained by ODF and ODA
- Evaluated by OHA

Fall 2011 Investigation Area

Potential clearcut units (in yellow) were identified from ODF data. Fall 2011 participants were recruited from areas within 1.5 miles of 2010/2011 units near Blachly and Greenleaf (orange circles).
Fall Sampling Results - Urine

ATSDR and OHA collected 66 urine samples from 38 households between 8/30-31/2011

- None of the participants had atrazine or any of its breakdown products in their urine samples.
- Five of the participants did not have any 2,4-D detected in their urine samples.
- Six participants had levels of 2,4-D that ATSDR considers elevated, as compared to the levels found in the general U.S. population, as reported by NHANES.
- The results ranged from undetectable to 37.33 micrograms per gram ($\mu g/g$) of creatinine.

### NHANES V. Hwy 36

- NHANES 2001-2002:
  - 50% < 0.2 ug/L
  - 25% 0.2-0.23 ug/L
  - 20% 0.24-1.27 ug/L
- Highway 36 E1:
  - 56% 0.24-1.27 ug/L
  - 11% 0.2-0.23 ug/L
  - 6% > 1.27 ug/L
  - 5% < 0.2 ug/L
Fall Environmental Sampling

- The USEPA collected drinking water, soil, vegetation, and/or food samples from 38 households
- Oregon DEQ lab analyzed water samples
  - tested each water sample for over 100 analytes
- ODA lab analyzed all other environmental samples
  - Tested samples for the 11 analytes of most concern for forest land applications.

Environmental Sampling Results

- Drinking Water Samples

<table>
<thead>
<tr>
<th>Detection/Analyte</th>
<th>Concentration (ppb)</th>
<th>Health-Based Screening Value (ppb)</th>
<th>Source of Screening Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEET in domestic well</td>
<td>.0047</td>
<td>3,300</td>
<td>Derived using ATSDR methodology based on RfD developed by Minnesota Department of Health (0.33 mg/kg-day)</td>
</tr>
<tr>
<td>DEET in Little Lake</td>
<td>.0058</td>
<td>3,300</td>
<td>Derived using ATSDR methodology based on RfD developed by Minnesota Department of Health (0.33 mg/kg-day)</td>
</tr>
<tr>
<td>(Surface Water)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hexazinone in</td>
<td>.183</td>
<td>1,200</td>
<td>EPA regional screening level</td>
</tr>
<tr>
<td>domestic spring</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluridone in domestic</td>
<td>.031</td>
<td>2,900</td>
<td>EPA regional screening level</td>
</tr>
<tr>
<td>well</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Environmental Sampling Results

- **Soil Samples**

<table>
<thead>
<tr>
<th>Detects in Soil</th>
<th>Analyte Detected</th>
<th>Analyte Concentration (ppm)</th>
<th>Health-based Screening Value (ppm)</th>
<th>Source of screening value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household 1</td>
<td>Glyphosate</td>
<td>0.081</td>
<td>5,000</td>
<td>ATSDR</td>
</tr>
<tr>
<td></td>
<td>2,4-D</td>
<td>0.046</td>
<td>500</td>
<td>ATSDR</td>
</tr>
<tr>
<td>Household 2</td>
<td>2,4-D</td>
<td>0.014</td>
<td>500</td>
<td>ATSDR</td>
</tr>
<tr>
<td>Household 3</td>
<td>Glyphosate</td>
<td>3.3</td>
<td>5,000</td>
<td>ATSDR</td>
</tr>
</tbody>
</table>

Environmental Sampling Results

- **Vegetation and Food Samples**
  - Blackberries
  - Other berries
  - Garden vegetables
  - Eggs
  - Milk (cow)
  - Honey
  - Vegetation

- No analytes were detected in any of the food or vegetation samples
Spring 2012 Sampling Plan

- **Participant Recruitment**
  - Identification of harvested areas planned to be treated
    - 2,4-D and Atrazine – required for urine sampling
    - 1.5 mile distance from application
    - Use of aerial application method

- **Urine Sampling**
  - Pre-Post Aerial application

- **Air Sampling**
  - Pre-Post Aerial application using high volume air samplers

### Recruitment Process

1. Landowners notify OHA about spray locations and times.
2. OHA recruits participants within 1.5 – 2 miles of spray locations.
3. OHA collects urine samples from all participants, and leaves cups for post-spray samples.
4. OHA stores pre-spray samples at Oregon Public Health Laboratory.
5. OHA contacts participants nearby and advises them to collect post-spray sample within 24 hours.
6. Participants collect samples and store in home freezer.
7. OHA collects post-spray samples and stores at Oregon Public Health Lab.
8. OHA sends all stored pre- and post-spray samples to analytical lab(s).

### Sample Processing

After all post-spray samples are collected:

<table>
<thead>
<tr>
<th>Recruitment</th>
<th>Pre-spray Collection</th>
<th>Spray Notification*</th>
<th>Post-spray Collection*</th>
<th>Sample Processing</th>
<th>Lab Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior to start of spray season</td>
<td></td>
<td></td>
<td></td>
<td>After all post-spray samples are collected</td>
<td></td>
</tr>
</tbody>
</table>
Based on landowner-provided information, OHA identified 3 units that would have aerial applications AND would possibly be treated with 2,4-D or atrazine (orange with red outlines). OHA initially planned to recruit within 1.5 miles of these units (orange circles), and later expanded to 2 miles (red circles).
Air Testing

- Technical Options
  - Active Sampling v. Passive Sampling

- Timing and Location
  - Active Sampling
  - Passive Sampling

Herbicide Vapor Concentrations

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>MW</th>
<th>Vapor Pressure mm Hg</th>
<th>Conc ppm</th>
<th>Conc µg/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atrazine</td>
<td>215.69</td>
<td>3.0E-07</td>
<td>0.0004</td>
<td>3</td>
</tr>
<tr>
<td>Hexazinone</td>
<td>252.3</td>
<td>1.9E-09</td>
<td>0.000003</td>
<td>0.03</td>
</tr>
<tr>
<td>Imazapyr</td>
<td>261.3</td>
<td>8.0E-11</td>
<td>0.000001</td>
<td>0.001</td>
</tr>
<tr>
<td>Clopyralid</td>
<td>192</td>
<td>1.2E-05</td>
<td>0.02</td>
<td>124</td>
</tr>
<tr>
<td>Aminopyrlid</td>
<td>207</td>
<td>7.1E-07</td>
<td>0.0009</td>
<td>8</td>
</tr>
<tr>
<td>Picloram</td>
<td>241.5</td>
<td>1.2E-07</td>
<td>0.0002</td>
<td>2</td>
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<tr>
<td>Triclopyr</td>
<td>356.7</td>
<td>3.6E-06</td>
<td>0.005</td>
<td>69</td>
</tr>
<tr>
<td>2,4-D</td>
<td>221</td>
<td>1.0E-07</td>
<td>0.0001</td>
<td>1</td>
</tr>
<tr>
<td>Sulfometuron methyl</td>
<td>364.4</td>
<td>5.0E-16</td>
<td>0.000000000007</td>
<td>0.00000001</td>
</tr>
<tr>
<td>Metsulfuron methyl</td>
<td>381.4</td>
<td>2.5E-12</td>
<td>0.000000003</td>
<td>0.000005</td>
</tr>
</tbody>
</table>
Next Steps

- Plan future air sampling
- Analyze pesticide application records
- Finalize analysis of Fall sample data
- Complete and release Public Health Assessment Report

OHA Public Health Assessment

- Planned for release in Summer 2012
- Data to be included in PHA
  - Fall 2011 biological and environmental data
  - Pesticide Application record data
  - Review of data contributed by local residents
- Public comment
Questions?