Phillips Community Air Emissions Reduction

Maddie Norgaard
MnTAP Advisor: Nathan Landwehr
Site Supervisor: Will Delaney
Agenda

• Partnership and Community Overview
• My Project
  • Goal
  • Scope
  • Approach
  • Barriers
  • Results
  • Wrap-Up
Project Partners
Community Overview

Phillips Community

[Image of a map with the Phillips Community highlighted]

[Image of Hope Community, Inc. building]

[Image of a community garden]

[Logo of MNTAP]

[University of Minnesota]
Project Goal

Reduce Hazardous Air Pollutants (HAPs), Volatile Organic Compounds (VOCs), and ground-level ozone (smog) from non-regulated and/or distributed sources of air pollution
Why Automotive Repair Shops?

- Small degreasing operations make up 14% of all industrial VOC air pollution in Minnesota
- Concentrated in Phillips
- Good candidate for voluntary action
- Transferrable to other industries
Worker and Public Health Improvement

• Minimize health impacts of cleaning/degreasing chemicals
• Reduce impact on economically vulnerable, environmentally stressed communities
Why is choosing safer products such a challenge?

Consumer Confusion

Choosing "Safer" Products
"Safer" is defined by: No HAP, Low VOC, Low Ozone Generator, Minimize Chemicals of Concern

- **Safer Product?**
  - Gather SDS or Chemical Information
  - List Chemicals by wt% and CAS#
  - Check Lists for CAS#
  - NO HAP, Minimal VOC, Low Ozone?
  - Keep Looking

- **Find VOC/HAP Content**
  - MIR Scale SAPRC-07
  - MPCA (EPA) HAPs
  - EPA Safer Chemical's
  - MnDOH Chemical of Concern

- **Find MIR Value for CAS#**
  - Calculate Ozone/Mass

DEEPER Resources
- EPA's TEST, AIM, EPISuite
- Pharos
- Green Screen

Yes, It's Good!
Approach

1. Outreach and Engagement
2. Analyze Product Safety
3. Identify Safer Alternatives
4. Deliver Assessments and Samples
5. Follow-up(s)
6. Deliver Product Cases
1. Outreach and Engagement

• 24 businesses reached
• 15 businesses were good candidates and willing to participate
• 1 Alley Newspaper article

• Initial Contact
  • Quick intro
  • Product name
  • Part number
  • Amount used
  • Preferred retailer
2. Product Analysis

• O’Reilly Brake Parts Cleaner Non-Chlorinated #72408

<table>
<thead>
<tr>
<th>Company</th>
<th>Product Name</th>
<th>Ingredients</th>
<th>CAS#</th>
<th>wt%</th>
<th>Ozone Number</th>
<th>MIR</th>
<th>Ozone (lbs/year)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>O'Reilly</td>
<td>O'Reilly Brake Cleaner Non-Chlorinated #72408</td>
<td>Toluene</td>
<td>108-88-3</td>
<td>32</td>
<td>1.61</td>
<td>4</td>
<td>254 (157.5*1.6)</td>
<td>HAP, COC-Eyes, Dev, Immune</td>
</tr>
<tr>
<td></td>
<td>1 can (14oz) 15 cases/yr-20 cases/yr</td>
<td>Methanol</td>
<td>67-56-1</td>
<td>38</td>
<td>0.67</td>
<td></td>
<td></td>
<td>HAP - development</td>
</tr>
<tr>
<td></td>
<td>(15 cases/yr<em>14oz/can</em>12 cans/case)/16lbs/yr=157.5 lbs/yr</td>
<td>Acetone</td>
<td>67-64-1</td>
<td>22</td>
<td>0.36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Carbon dioxide</td>
<td>124-38-9</td>
<td>8</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3. Identify Safer Alternatives
### 3. Identify Safer Alternatives

**• CRC Brakleen #05050 (Brake Parts Cleaner)**

<table>
<thead>
<tr>
<th>Company</th>
<th>Product Name</th>
<th>Ingredients</th>
<th>CAS#</th>
<th>wt%</th>
<th>Ozone Number</th>
<th>MIR</th>
<th>Ozone (lbs/year)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRC</td>
<td>Brakleen #05050</td>
<td>Acetone</td>
<td>67-64-1</td>
<td>90</td>
<td>0.46</td>
<td>0.36</td>
<td>72.45 (157.5*)</td>
<td>0.46</td>
</tr>
<tr>
<td>157.5 lbs/yr</td>
<td>HAPs 0% VOC 9.2%</td>
<td>n-Heptane</td>
<td>142-82-5</td>
<td>4.5</td>
<td>1.07</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3-methylhexane</td>
<td>589-34-4</td>
<td>2.5</td>
<td>1.61</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>methylcyclohexane</td>
<td>108-87-2</td>
<td>2.5</td>
<td>1.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>cyclohexane</td>
<td>110-82-7</td>
<td>0.5</td>
<td>1.25</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3. Identify Safer Alternatives

- Safety-Kleen aqueous-based parts washer
- Green business cost share program
  - City of Minneapolis & MPCA supported
  - Covers 45% of upfront cost and service
  - 1 shop took opportunity

Solvent-based

Aqueous-based
Approach

1. Outreach and Engagement
2. Analyze Product Safety
3. Identify Safer Alternatives
4. Deliver Assessments and Samples
5. Follow-up(s)
6. Deliver Product Cases
Barriers

• Safer product availability
• Knowledge and awareness
• Performance
• Cost
• Policy
Results

Outreach and Engagement
- 24 shops reached
- 14 shops participated

Behavior Change
- 11/14 shops switched to safer products
- 1/14 shops switched to water-based parts washer

Air Emissions Reduced
- 430 lbs HAPs reduced per year
- 840 lbs VOCs reduced per year
- 1,730 lbs Ground-level ozone reduced per year
Wrap-Up

• Overall positive reception
• Desire to make a difference
• Demonstrated interest and need for safer products
• Increased awareness

• Enjoyed working in the community and bringing the pieces together
• Appreciation for green chemistry and its applications
• Inspired by Phillips and Hope Community
Thank you:
Participating shops/retailers
Hope Community staff
MnTAP staff
Lake Street Council staff
Franklin Area Business Association
Environmental Protection Agency
Questions?