Neighborhoods on the fence line of refineries throughout Louisiana face exposure to harmful chemicals on a daily basis. The chronic problems in refinery operations impact the neighboring community, the workers, and all of us in Louisiana.

*Common Ground* is an analysis of refineries’ reports to the state. The goal is to identify trends of problems so that accidents can be reduced. With over 200,000 people living within 2 miles of a refinery in Louisiana, there is a clear need to reduce accidents and eliminate exposure to hazardous chemicals.4

### Key Findings

- **5+ accidents per week in 2011.** 301 total reported accidents, over 1 million pounds of air pollution, and over 1.3 million gallons of soil and water pollution at Louisiana refineries.
- **ExxonMobil reported the most accidents of any company.** 138 accidents were reported from their two refineries in Chalmette and Baton Rouge in 2011, resulting in over 428,000 pounds and over 1,274,000 gallons of pollution.
- **EPA’s Inspector General found that Louisiana Department Environmental Quality had “poor performance.”**3 The LDEQ failed to perform adequate inspections according to a review released in December of 2011.
- **Inadequate reporting.** Over 20% of reports across all refineries contain no information about the accident, what was released, how much, what caused the accident and what will be done to prevent it in the future.

### Recommendations

**Refineries**

- Hire more full-time workers. Contractors may be temporary, receive less training, and can be terminated easily.
- Acknowledge accidents and collaborate to prevent future accidents.
- Comply with the Occupational Safety and Health Administration’s (OSHA) Process Safety Management standard. This standard guides industry to safely manage transportation, processing and use of highly hazardous chemicals.
- Improve accuracy and timeliness of reporting by using root cause analysis for all accidents and employing continuous emissions monitoring technology to calculate (not estimate) emissions.
- Improve preparedness for rain, wind, lightning, tropical storms, and hurricanes. Storms are a perpetual risk. Refineries’ use of “act of God” to explain their accidents is an excuse for poor planning and lack of a root cause analysis.

**Government**

- Incorporate community and worker input in inspections, investigations, and negotiations with oil industry.
- Enforce regulations. This will create jobs and incentivize preventative maintenance.
- Include workers and residents in local emergency planning commissions and convene these meetings.
- Increase enforcement in Louisiana, including meaningful fines for lawbreakers.
- Improve emergency preparedness by conducting unannounced inspections and reviewing storm preparedness plans.

### Refinery Accident Causes 2005-2011

(by number of accidents)
According to ExxonMobil's reports, the following units had the most problems from 2005-2011:


- **Coke Plant**: 18 accidents released 158,808 lbs. in 2005-2008.

- **Sulfur Plant**: 16 accidents released 382,037 lbs. in 2005-2011.


- **Fluid Catalytic Cracking Unit**: 9 accidents released 31,282 lbs. in 2005-2009.

- **Depropanizer**: 8 accidents released 135,106 lbs. in 2005-2011.

- **Refinery Gas Compression Unit**: 8 accidents in 2005-2010 released 8309 lbs.

- **Furnace 201 and 301**: 7 accidents in 2005-2011 released 149,986 lbs.

- **Hydrocracker Unit**: 5 accidents released 10,420 lbs. in 2006-2010.

- **Tanks**: 5 total accidents released 6,021 lbs. from 2009-2011. Tank 100 had 3 accidents in 2009-2010 that released 3,212 lbs.

- **Wet Gas Scrubber**: 4 accidents from 2005-2009 released 159,805 lbs.

*lbs. or gallons refer to the weight or volume of all pollutants released per unit

---

**ExxonMobil, Baton Rouge**

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**Community Voices**

"My children are frequently sick. As a matter of fact, I just got my youngest daughter from the eye doctor this morning where she is constantly keeping some type of dry eye infection. The doctors think it comes from the atmosphere we live in."

"[In Standard Heights] the spirit is broken. A lot of people are just really angry."

“We really need to try to take some action and try to understand, ‘what is it we can do together?’ As a community, we should try to pull everyone on together, so that if something were to happen again, we can try to have some things in order.”

“We see lots of children throughout the neighborhood that suffer from upper respiratory infection repeatedly. The constant nose running, the constant sneezing, the headaches, and sometimes vomiting.”

---

"The doctors think it comes from the atmosphere we live in."

-Tonga Nolan, Standard Heights Community Organization

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Air Pollution by Cause, 2005-2011

<table>
<thead>
<tr>
<th>Cause</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weather</td>
<td>30.5%</td>
</tr>
<tr>
<td>Instrument Failure</td>
<td>13.4%</td>
</tr>
<tr>
<td>Piping or Tubing</td>
<td>10.0%</td>
</tr>
<tr>
<td>Start Up, Shut Down</td>
<td>3.6%</td>
</tr>
<tr>
<td>Seal or Gasket</td>
<td>1.0%</td>
</tr>
<tr>
<td>Process Upset</td>
<td>3.4%</td>
</tr>
<tr>
<td>Under Investigation</td>
<td>3.3%</td>
</tr>
<tr>
<td>Maintenance/Procedures</td>
<td>0.1%</td>
</tr>
<tr>
<td>Other</td>
<td>0.9%</td>
</tr>
<tr>
<td>Under Investigation</td>
<td>3.3%</td>
</tr>
<tr>
<td>Equipment Failure</td>
<td>9.1%</td>
</tr>
<tr>
<td>Human Factors</td>
<td>2.4%</td>
</tr>
<tr>
<td>No Information Given</td>
<td>0.3%</td>
</tr>
<tr>
<td>Given</td>
<td>0.3%</td>
</tr>
</tbody>
</table>

---

Pollution from 2005-2011

- 4.3 million+ pounds
- 45,000+ gallons
- 793 accidents
When I found out that Tank 175 was leaking hydrogen sulfuric acid [hydrogen sulfide], I also learned that the refinery doesn’t regularly check for maintenance and they don’t invest in new equipment. I submitted a citizen’s complaint about the tank, and two months later I learned that a valve associated with that same tank had failed! I thought they had repaired the tank and all of its parts to the fullest extent but that’s not the case. They patch up the problem, but they don’t fix it. Sure the refineries give $2000 a year for all of our problems, but that could never make up how their actions have affected my family’s lifestyle.

Trying to work with the refinery, and living with its consequences, is a nightmare. It’s bad we live in this environment; it’s scary. Every time something goes wrong, I think, What can I do to protect myself, my family, and my friends? The refinery representatives talk to you like you don’t know anything [and] say look, we do this for you, we do that. It’s terrible because they find ways to disqualify what they’re doing to the environment. As I keep working with the refinery and living with them, I think, When am I going to wake up from this nightmare? This year has been successful for reaching my neighbors because I distribute documents about refinery accidents that let community members read and figure out the issues by themselves.”

Thanks to the hard work of Residents for Air Neutralization and their president Ms. Velma White, the EPA conducted a surprise inspection of Calumet Lubricants in August of 2011.

“There have been flares that lit up the night sky and blacked out the daylight as well.”
-R.J. Bowman, Residents for Air Neutralization

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**Calumet Lubricants 8, Shreveport**

According to Calumet Lubricant’s reports, the following units had the most problems from 2005-2011:

- **Sulfur Recovery Unit**: 19 total accidents and 88,007 lbs. released from 2005-2011, typically going to Flare #3.
- **Vacuum Distillation Unit #4**: 5 accidents and 3,745 lbs. released from 2005-2008.
- **Hydrotreatment**: 4 total accidents and 424 lbs. from 2005-2011.
- **Gas Compressor**: 3 total accidents and 2,386 lbs. from 2008-2011.

*lbs. or gallons refer to the weight or volume of all pollutants released per unit.*

### Air Pollution by Cause, 2005-2011

- **Equipment Failure**: 71.8%
- **Process Upset**: 11.6%
- **Power Failure**: 1.3%
- **Seal of Gasket**: 3.9%
- **Weather**: 7.4%
- **Piping or Tubing**: 0.3%
- **Maintenance & Procedures**: 0.03%

### Ground and Water Pollution by Cause, 2005-2011

- **Seal or Gasket**: 0.2%
- **Equipment Failure**: 5.4%
- **Corrosion**: 4.0%
- **Human Factors**: 12.0%
- **Instrument Failure**: 29.4%
- **No Information Given**: 2.0%

### Pollution from 2005-2011

- 318,000+ pounds
- 104,000+ gallons
- 101 accidents
According to Motiva Norco’s reports, the following units had the most problems from 2005-2011:

- **Sulfur Plant**: 29 accidents released 34,291 lbs. in 2005-2011.
- **Hydrocracker Unit**: 23 accidents in 2005-2010 released 45,325 lbs.
- **Tanks**: 19 accidents from 2005-2011 released 34,487 lbs. and 15,157 gallons.
- **GO-1 Process Unit**: 12 accidents released 35,455 lbs. in 2005-2011.
- **DU-5 Dobson Unit**: 10 accidents released 148,225 lbs. and 66 gallons in 2007-2010.
- **Coke Plant**: 10 total accidents from 2005-2011 released 17,477 lbs. The wet gas compressor had 3 accidents from 2009-2011, and released 3,099 lbs.
- **Boiler**: 4 accidents in 2006-2011 released 19,026 lbs.
- **Process Gas Compressor**: 3 accidents released 79,362 lbs. in 2006-2011.
- **Recycle Gas Compressor**: 3 accidents released 89 lbs. from 2008-2011.

“I think that they should have a better procedure about at least warning us and give us the option about evacuating. Sometimes things happen at the plant, and they don’t even tell us. That’s to keep it confidential so we won’t know anything about it, probably thinking we will have a class action suit. But a lot of people say, on the other side of the track are different races, may get the information before we do. By the time we hear it, they neutralize the situation or it’s still going on or it’s in process but we have no awareness of it going on.

You know, they evacuate some in this area, and here we be this close [to the plant] and they say you don’t have to [evacuate]. Our awareness is not like it’s supposed to be when things are going on in the neighborhood like it is. We need to know more.”

“Sometimes things happen at the plant and they don’t even tell us.”

- Calvin Smith of Norco, LA

**Motiva (Norco, LA)**

According to Motiva Norco’s reports, the following units had the most problems from 2005-2011:

- **Sulfur Plant**: 29 accidents released 34,291 lbs. in 2005-2011.
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*lbs. or gallons refer to the weight or volume of all pollutants released per unit

**Pollution from 2005-2011**

- 1.8 million+ pounds
- 19,000+ gallons
- 209 accidents
### Health Effects of Pollutants

All values are reported by refineries from 2005-2011 to the Louisiana Department of Environmental Quality.

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Amount Released</th>
<th>Potential Health Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfur Dioxide</td>
<td>10.3 million pounds</td>
<td>Respiratory irritant, mutagen, and cardiovascular toxicant.</td>
</tr>
<tr>
<td>Volatile Organic Compounds (VOC)</td>
<td>2.6 million pounds</td>
<td>May cause various irritations, possible cancer risk, and act as a toxicant.</td>
</tr>
<tr>
<td>Benzene</td>
<td>154,944 pounds</td>
<td>Known carcinogen. May cause cancer, immune system damage, reproductive damage, headaches, and disorientation.</td>
</tr>
<tr>
<td>Hydrogen Sulfide</td>
<td>133,069 pounds</td>
<td>May cause asthma attacks, respiratory, neurological, and eye irritation.</td>
</tr>
<tr>
<td>1,3-Butadiene</td>
<td>34,155 pounds</td>
<td>May cause cancer, irritant of the eyes, reproductive system, skin, and neurological system.</td>
</tr>
</tbody>
</table>


### 2011 Top 10 Accidents by Emissions

<table>
<thead>
<tr>
<th>Refinery</th>
<th>Chemical</th>
<th>Release</th>
<th>Date</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chalmette Refining (ExxonMobil)</td>
<td>Cooling Water (non-contact)</td>
<td>1.3 million gallons</td>
<td>6/5/2011</td>
<td>Outfall 003; Outfall 210</td>
</tr>
<tr>
<td>Chalmette Refining (ExxonMobil)</td>
<td>Sulfur dioxide</td>
<td>164,891 pounds</td>
<td>10/10/2011</td>
<td>Flare 1; Sulfur Recovery Unit 1</td>
</tr>
<tr>
<td></td>
<td>Hydrogen sulfide</td>
<td>595 pounds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CITGO Petroleum</td>
<td>Sulfur dioxide</td>
<td>156,488 pounds</td>
<td>4/26/2011</td>
<td>Multiple Units</td>
</tr>
<tr>
<td>Chalmette Refining (ExxonMobil)</td>
<td>Sulfur dioxide</td>
<td>117,344 pounds</td>
<td>5/13/2011</td>
<td>Flare 1; Sulfur Recovery Unit Train II</td>
</tr>
<tr>
<td>Motiva Enterprises</td>
<td>Total Pollution</td>
<td>75,714 pounds</td>
<td>3/11/2011</td>
<td>GO-1 Elevated Flare</td>
</tr>
<tr>
<td>Norco</td>
<td>Carbon monoxide</td>
<td>40,228 pounds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motiva Enterprises</td>
<td>Total Pollution</td>
<td>41,970 pounds</td>
<td>9/26/2011</td>
<td>GO-1 Elevated Flare RCCU Elevated Flare</td>
</tr>
<tr>
<td>Norco</td>
<td>Sulfur dioxide</td>
<td>29,638 pounds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valero St. Charles Refinery</td>
<td>Volatile organic compounds</td>
<td>37,495 pounds</td>
<td>10/4/2011</td>
<td>Cooling Tower 800</td>
</tr>
<tr>
<td></td>
<td>Benzene</td>
<td>1,027 pounds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chalmette Refining (ExxonMobil)</td>
<td>Sulfur dioxide</td>
<td>36,579 pounds</td>
<td>9/11/2011</td>
<td>Flare No. 1</td>
</tr>
<tr>
<td></td>
<td>Hydrogen sulfide</td>
<td>220 pounds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calumet Lubricants 8</td>
<td>Sulfur dioxide</td>
<td>30,393 pounds</td>
<td>8/2/2011</td>
<td>Sulfur Recovery Unit</td>
</tr>
<tr>
<td>Valero St. Charles Refinery</td>
<td>Isobutane</td>
<td>27,893 pounds</td>
<td>6/18/2011</td>
<td>Spent Acid Alkylation Unit</td>
</tr>
<tr>
<td></td>
<td>Sulfur dioxide</td>
<td>170 pounds</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Refinery Unit Trends 2005-2011

Identifying problematic units and equipment helps refineries and residents identify the sources of danger in their community. After analyzing the accidents from 2005-2011, several types of equipment appear with greater frequency and release a significant portion of pollution.

Tanks are a common place to find large quantities of chemicals in refineries. Thirteen of the sixteen active refineries had tanks that were the source of repeated accidents between 2005 to 2011.

Sulfur plants are also the source of many accidents. A sulfur plant includes several units, such as the recovery unit and the train. 243 sulfur plant accidents occurred at thirteen refineries from the beginning of 2005 to the end of 2011. These accidents release great volumes of sulfur dioxide and hydrogen sulfide into the air. The health effects range from asthma to cancer.

Cooling towers and fluid catalytic cracking units (cat crackers) are also a source of cancer-causing pollution. The fluid catalytic cracking unit can have devastating outcomes when large accidents occur. The cooling towers showed an even greater level of pollution per accident from refining units with trends of accidents. In 53 accidents, over

<table>
<thead>
<tr>
<th>System</th>
<th># of Refineries</th>
<th># of Accidents</th>
<th>Amount of Pollution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tanks</td>
<td>13</td>
<td>210</td>
<td>2.7 million pounds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2.7 million gallons</td>
</tr>
<tr>
<td>Sulfur Plant</td>
<td>13</td>
<td>243</td>
<td>5.3 million pounds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>25 gallons</td>
</tr>
<tr>
<td>Fluid Catalytic</td>
<td>10</td>
<td>128</td>
<td>972,516 pounds</td>
</tr>
<tr>
<td>Cracking Unit</td>
<td></td>
<td></td>
<td>100 gallons</td>
</tr>
<tr>
<td>Coker Unit</td>
<td>8</td>
<td>124</td>
<td>680,760 pounds</td>
</tr>
<tr>
<td>Gas Compressors</td>
<td>7</td>
<td>60</td>
<td>348,238 pounds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 gallons</td>
</tr>
<tr>
<td>Crude Unit</td>
<td>6</td>
<td>39</td>
<td>192,519 pounds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>758 gallons</td>
</tr>
<tr>
<td>Cooling Towers</td>
<td>5</td>
<td>53</td>
<td>203,242 pounds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.3 million gallons</td>
</tr>
<tr>
<td>Hydrotreater</td>
<td>5</td>
<td>31</td>
<td>57,991 pounds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3,459 gallons</td>
</tr>
<tr>
<td>Alkylation Unit</td>
<td>5</td>
<td>25</td>
<td>23,557 pounds</td>
</tr>
<tr>
<td>Hydrocracker</td>
<td>3</td>
<td>49</td>
<td>123,400 pounds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>104 gallons</td>
</tr>
</tbody>
</table>

Major Accident

Timeline: 2011

Jan 8 - Placid Refining
Port Allen
18,735 gallons
Frac water

Jan 16 - ConocoPhillips
Lake Charles
17,220 gallons
Crude oil

March 11 - Motiva Norco
40,228 lbs
Carbon monoxide

April 26 - CITGO
Lake Charles
156,488 lbs
Sulfur dioxide

May 13 - Chalmette
117,344 lbs
Sulfur dioxide

June 5 - Chalmette
1,268,400 gallons
Cooling Water

June 18 - Valero Norco
27,893 lbs
Isobutane
1.2 million gallons of pollution were released. These two units together show trends of accidents that contribute high combined pollution. These units release high levels of volatile organic compounds, toxicants, and heavy metals into the air and ground water of surrounding communities.

The coker unit produced nearly 340 tons of reported pollution between 2005 and 2011. The coker unit has one of the highest ratios of accidents per refinery in our analysis with 15.5 accidents per refinery (124 accidents in 8 refineries).

### Refinery Emissions in 2011

<table>
<thead>
<tr>
<th>Refinery, City</th>
<th>2011 Accidents</th>
<th>Air Emissions (pounds)</th>
<th>Ground or Water Emissions (gallons)</th>
<th>% Child Poverty (within 2mi of refinery&lt;sup&gt;4&lt;/sup&gt;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ExxonMobil, Baton Rouge</td>
<td>98</td>
<td>30,985</td>
<td>2,412</td>
<td>45.3%</td>
</tr>
<tr>
<td>Chalmette Refining, Chalmette</td>
<td>40</td>
<td>397,852</td>
<td>1,271,925</td>
<td>18.6%</td>
</tr>
<tr>
<td>Motiva, Norco</td>
<td>31</td>
<td>181,978</td>
<td>84</td>
<td>17%</td>
</tr>
<tr>
<td>Citgo, Lake Charles</td>
<td>24</td>
<td>170,419</td>
<td>3,024</td>
<td>11%</td>
</tr>
<tr>
<td>Calumet, Shreveport</td>
<td>19</td>
<td>61,653</td>
<td>12,180</td>
<td>48.2%</td>
</tr>
<tr>
<td>Marathon, Garyville</td>
<td>18</td>
<td>36,419</td>
<td>3,179</td>
<td>37.9%</td>
</tr>
</tbody>
</table>


### Note on Inadequate Reporting:

Refineries have increased the number of accidents reported as Below Reportable Quantity. When accidents are reported Below Reportable Quantity, the facility is not required to provide any details about the accident such as pollutant released, quantity emitted and the root cause. Accident reports of Below Reportable Quantity releases at ExxonMobil in Baton Rouge increased from nearly 12% from 2005-2007 to more than 70% between 2009-2011. A 2011 EPA inspection conducted at Calumet Lubricants in Shreveport found that “in the 161 incident reports selected by EPA for review, 133 [83%] had no or inadequate information and the contributing factors that contributed to the incident were left out of many reports.”

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### Refinery Emissions Timeline

- **Aug 2 - Calumet 8**
  - Shreveport
  - 30,393 lbs Sulfur dioxides

- **Aug 5 - Motiva Norco**
  - 25,826 lbs Carbon monoxide

- **Sept. 11 - Chalmette**
  - 36,579 lbs Sulfur dioxides

- **Sept. 26 - Motiva Norco**
  - 29,547 lbs Sulfur dioxides

- **Oct. 4 - Valero Norco**
  - 37,495 lbs VOCs

- **Oct. 7 - Chalmette**
  - 21,085 lbs Hydrocarbon

- **Oct. 10 - Chalmette**
  - 164,891 lbs Sulfur dioxide
Emissions via Accidents in 2011

Causes of Air Emissions in 2011

- Human Factors 0.11%
  - Start Up, Shut Down 0.21%
- Power Failure 0.02%
- Weather 15.87%
- Equipment Failure 49.44%
- Process Upset 12.24%
  - Seal or Gasket 9.13%
- Corrosion 6.59%
- No Information Given 1.88%
- Under Investigation 2.10%
- Piping or Tubing 0.36%
  - Equipment Design 0.16%
  - Maintenance and Procedures 0.79%
- Instrument Failure 0.83%

Causes of Ground & Water Emissions in 2011

- Under Investigation 0.09%
- No Information Given 0.03%
- Weather 0.02%
- Piping or Tubing 95.74%
- Seal or Gasket 0.04%
- Corrosion 0.18%
- Equipment Failure 0.29%
- Process Upset 0.32%
- Instrument Failure 1.30%
- Human Failure 1.99%

Definitions

- Environmental Protection Agency (EPA)
  The federal agency charged with permitting, regulating, and enforcing the Clean Air Act, Clean Water Act, and other federal environmental laws.
- Louisiana Dept. of Environmental Quality (LDEQ)
  The state agency responsible for permitting, regulating, and enforcing state and federal environmental laws in Louisiana.

Sources


Acknowledgments

Produced by Louisiana Bucket Brigade, the United Steelworkers, Standard Heights Community Association, and Residents for Air Neutralization.

Written by Jay Colingham and Risha Bera.

Research conducted by: Jay Colingham, Risha Bera, Molly Szymanski, Helen Bost, Ellen Dean, Kyle Gross, Sydney Howard, Kia Jones, Selena Gonzalez, Tyrone Chambers II, Jamie Edwards, Jakob Rosenzwieg, and Amy Lin.

Edited by Anne Rolfe, Anna Hrybyk, and Darryl Malek-Wiley.

Special thanks to Chris Campbell and the Environmental Working Group.